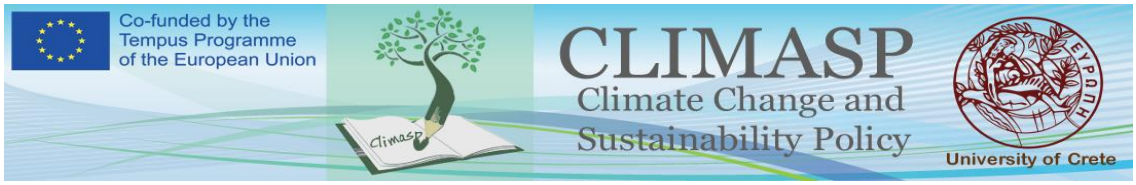

CLIMASP Course Syllabi and Course Modules

Deliverable Number: D4.2
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Author(s): Nelly Kostoulas and Vassilios Makrakis University of Crete and
Marlene Mader Leuphana University (ULG)
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Project Funding
Project Full Title**: Developing an Interdisciplinary Minor in Climate Change and Sustainability Policy**
Project Acronym: **CLIMASP**
Project number: **543879 TEMPUS-1-2013-1-GR-TEMPUS-JPCR**
EC Programme: **TEMPUS**
Agreement number: **JPCR (2013-2013-5043/001-001)**
Start date: **1st December, 2013**
Duration: **3 years**
Budget: **1 246 635 €**

Executive Summary

The CLIMASP course curriculum development started in June, 2015. Every Working Group led by the institutional design team in each partner university proceed to the development of 24-30 course syllabi and course modules in the CLIMASP three concentration areas on the basis of stakeholders' inputs. The courses to be revised were identified and described in the previous deliverable. The methodological approach for the development was based on modularity, including the following steps: Formulate goal statements indicating the principle(s)/concept(s) at the completion of each course. Select the primary content base which will serve as the catalyst for content and instruction. Identify events, discoveries, and writings within other disciplines that relate to the primary content base in a meaningful way. Determine the key points of intersection between the disciplines which correspond to the set

instructional objectives. Formulate instructional/learning objectives, using the SMART method (specific, measurable, achievable, realistic, timed). Identify the necessary prerequisite knowledge that students must possess in each CLIMASP concentration area. The modular characteristic of the course modules provided flexibility that enabled adapting the different course modules to a wide range of academic requirement and enabled each partner institution to tailor CLIMASP according to its specific needs. As pointed in the previous deliverable, 240-300 course modules were identified to be developed in Arabic and English across the 10 partner universities. The inter-university design team in cooperation with the institutional design teams will define the minimum requirements that undergraduate students have to fulfil in order to qualify for the supplementary interdisciplinary CLIMASP minor in addition to their major disciplinary degree.

For the CLIMASP course syllabi/modules development, specific guidelines were given, especially the CLIMASP Toolkit and training sessions were carried out during the implementation phase. The courses developed are enlisted in the following section.

The CLIMASP Course Syllabi and Course Modules Revised

EGYPT

ASWAN

HUSD

PSU

SCU

JORDAN

AUM

HU

JU

UOJ

LEBANON

LAU

NDU

EGYPT ASWAN

Air Pollution

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
1. Environmental awareness 2. Strategic planning 3. Environmental awareness 4. Environmental management 5. Technology and innovation 6. Climate change adaptation 7. Risk assessment 8. Climate variability 9. Weather and climate 10. Climate change communication 11. Climate change and health 12. Strategic planning and climate change 13. Role of international	1. Adaptive learning and self-reflection; 2. Communicating 3. Contextualising 4. Critical, systemic and futures thinking 5. Debating 6. Discourse 7. Futures thinking 8. Leadership 9. Local knowledge 10. Motivate and manage change 11. Problem solving 12. Resolve ethical dilemmas	1. Accountability 2. Confident 3. Decisive 4. Democratic 5. Empathy 6. Environmental justice 7. Openness to novelty and change 8. Optimism 9. Organised 10. Respect and care for the community 11. Respect for diversity 12. Social cohesion 13. Social responsibility	1. Discuss the effects of air pollution on vegetation, soils, fresh water, and buildings. 2. Identify the characteristics of air pollution, relevant regulations, and control technologies. 3. Identify the different types of air pollutants. 4. Anticipate possible future environmental change and identify possible development consequences. 5. Estimate air pollution concentrations as a function of emission, meteorology, topography and the built environment for a combination of road and industrial sources. 6. Disseminate emission and air quality results to a wider audience. 7. Estimate health impact of changes in air pollution

institutions 14. Climate change: Science, impacts & scenarios 15. Future climate change scenarios	13. Team management	14. Transparency 15. Human rights 16. Sense of urgency 17. Human wellbeing 18. Social responsibility 19. Perspective 20. Co-responsibility 21. Systematic 22. Focussed	

Course Syllabus

Course Number:

Air Pollution

Port Said University, Faculty of Science, Department of Physics,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of science Campus
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Air Pollution**
Course Location: University Campus
Class Times:
Prerequisites:

Faculty Web Page: www.sci.psu.edu.eg

Course Description/Overview

The present course is intended to raise the students' awareness. It introduces students to the fundamentals of air pollution with a background on historical perspective on air pollution and a commentary on current air quality policies and standards It focuses on understanding the atmospheric phenomena and the destruction of natural balance, including noise pollution, inevitably brought about by human activities, It provides an overview of the history of air pollution, air pollutants, effect of air pollution on climate, air quality management, and indoor air pollution. It does so through tackling the following aspects: 1) natural sources of air pollution; 2) anthropogenic sources of air pollution; 3) airborne particulate matter; 4) size distribution of atmospheric aerosols; 5) negative impacts; 6) global warming; 7) air pollution act; 8) atmospheric stability; 9) thermal invasion; 10) modelling of air pollution and control devices. That is they are asked to read and summarize articles on air pollution and its sources. They are invited to discuss effect of air pollution on climate at local, national and international scales. In short, the course provides an appropriate chance for the students to get the minimum knowledge of major air pollutants; their sources and their effects (environmental, economic and health) and how emissions are estimated from road traffic and industrial sources.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of air pollution; b) to raise awareness of the learners about effects of air pollution on climate; c) help learners use traditional and electronic tools to identify the risks the different types of air pollutants; and d) to highlight the importance of renewable energy resources as clean and safe resources to the environment.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

8. Discuss the effects of air pollution on vegetation, soils, fresh water, and buildings.
9. Identify the characteristics of air pollution, relevant regulations, and control technologies.
10. Identify the different types of air pollutants.
11. Anticipate possible future environmental change and identify possible development consequences.

12. Estimate air pollution concentrations as a function of emission, meteorology, topography and the built environment for a combination of road and industrial sources.
13. Disseminate emission and air quality results to a wider audience.
14. Estimate health impact of changes in air pollution

Required Course Texts and Materials

Hands-out prepared by the instructor for the

- Environmental pollution and control , Ann Arbor, 1982.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		History of air pollution;
2		Current policies, standards and objectives;
3		Sources of air pollution;
4		Effects of major air pollutants;
6		Monitoring of emissions and air pollutants in ambient air;
7		Modelling and control of emission from road transport;
8		Modelling and control of emission from industrial sources;
9		Chemistry and dispersion of air pollution in atmosphere;
10		Air pollution modelling approaches;
11		Commercial air quality models (ADMS, USEPA models;
12		Indoor air pollution;
13		Personal exposure to air pollution

Atmospheric Physics

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
16. Environmental awareness 17. Gender-sensitive response to climate change 18. Climate change communication 19. Fairness and climate change justice 20. Future climate change scenarios	14. Adaptive learning and self-reflection; 15. Awareness and advocacy raising 16. Communicating 17. Contextualising 18. Critical, systemic and futures thinking 19. Debating 20. Discourse 21. Futures thinking 22. Integrated assessment 23. Leadership 24. Local knowledge 25. Mapping gender impacts 26. Motivate and manage change 27. Networked learning 28. Prioritising 29. Problem solving 30. Resolve ethical dilemmas 31. Scenario analysis and planning 32. Team management	23. Accountability 24. Confident 25. Decisive 26. Democratic 27. Empathy 28. Environmental justice 29. Gender-sensitive 30. Global mind-set/ consciousness 31. Interdependency 32. Needs vs. wants 33. Nonviolence & peace 34. Openness to novelty and change 35. Optimism 36. Organised 37. Respect and care for the community 38. Respect for diversity 39. Social cohesion 40. Social responsibility 41. Stewardship 42. Tolerance 43. Transparency	1. Describe the biosphere through the study of the natural state of ecosystems, the relationships between organisms and their environment and managing human and water resources. 2. Explain the relationships between organisms and their environment and managing human and water resources. 3. Question the relationships between Earth's atmosphere and the atmospheres of the other planets using fluid flow equations, chemical models, radiation balancing, and energy transfer processes in the atmosphere (as well as how these tie into other systems such as the oceans). 4. Anticipate possible future environmental changes and possible development consequences. 5. Understand scattering theory, wave propagation models, cloud physics, statistical mechanics and spatial statistics which are highly mathematical and related to physics 6. Demonstrate the knowledge and understanding of the links of atmospheric physics to meteorology and climatology.

		44. Virtue	7. Use the different tools and equipments to collect data needed for studying the atmosphere and atmospheric changes, 8. Anticipate the effect of atmosphere on climate change.

Course Syllabus

Course Number:

Atmospheric Physics

University of Port Said, Faculty of Science, Department of Physics, Spring Semester

Instructor Information

Instructor: Dr
Office Location: Faculty of Science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Atmospheric Physics**
Course Location: University Campus
Class Times:
Prerequisites:
Faculty Web Page:

Course Description/Overview

This course examines the dynamics of the biosphere through the study of the natural state of ecosystems. Emphasis is on the explanation of the relationships between organisms and their environment and on managing human and water resources. The application of physics to the study of the atmosphere attempts to model Earth's atmosphere and the atmospheres of the other planets using fluid flow equations, chemical models, radiation balancing, and energy transfer processes in the atmosphere (as well as how these tie into other systems such as the oceans). In order to model weather systems, atmospheric physicists employ elements of scattering theory, wave propagation models, cloud physics, statistical mechanics and spatial statistics which are highly mathematical and related to physics. It has close links to meteorology and climatology and also covers the design and construction of instruments for studying the atmosphere and the interpretation of the data they provide, including remote sensing instruments.

Course Learning Objectives

The overreaching goals of this course are: a) to examines of the dynamics of the biosphere through the study of the natural state of ecosystems; b) to provide the basic knowledge of environmental and resources studies; c) to raise awareness of the learners about the need to examine the relationships between organisms and their environment and managing human and water resources.; d) to model Earth's atmosphere and the atmospheres of the other planets using fluid flow equations, chemical models, radiation balancing, and energy transfer processes in the atmosphere (as well as how these tie into other systems such as the oceans).; e) to employ elements of scattering theory, wave propagation models, cloud physics, statistical mechanics and spatial statistics which are highly mathematical and related to physics.; f) to examine the links to meteorology and climatology; g) and also covers the design and construction of instruments for studying the atmosphere and the interpretation of the data they provide, including remote sensing instruments.

Course Objectives Learning Outcomes

Upon successful completion of this course, students will be able to:

9. Describe the biosphere through the study of the natural state of ecosystems, the relationships between organisms and their environment and managing human and water resources.
10. Explain the relationships between organisms and their environment and managing human and water resources.

11. Question the relationships between Earth's atmosphere and the atmospheres of the other planets using fluid flow equations, chemical models, radiation balancing, and energy transfer processes in the atmosphere (as well as how these tie into other systems such as the oceans).
12. Anticipate possible future environmental changes and possible development consequences.
13. Understand scattering theory, wave propagation models, cloud physics, statistical mechanics and spatial statistics which are highly mathematical and related to physics
14. Demonstrate the knowledge and understanding of the links of atmospheric physics to meteorology and climatology.
15. Use the different tools and equipments to collect data needed for studying the atmosphere and atmospheric changes,
16. Anticipate the effect of atmosphere on climate change.

- **Course Resources**

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Dynamics of the biosphere.
3		The natural state of ecosystems.
4		The links of atmospheric physics to meteorology and climatology.
5		The relationships between organisms and their environment and managing human and water resources.
6		Instruments for studying the atmosphere and the interpretation of the data they provide, including remote sensing instruments.

Basics of Environmental Sciences

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
21. Gender-sensitive response to climate change 22. Climate change communication 23. Fairness and climate change justice 24. Future climate change scenarios 25. Conflict over natural resources. 26. Multilateral environmental agreements 27. Future climate change scenarios	33. Adaptive learning and self-reflection; 34. Awareness and advocacy raising 35. Communicating 36. Contextualising 37. Critical, systemic and futures thinking 38. Debating 39. Discourse 40. Futures thinking 41. Integrated assessment 42. Leadership 43. Local knowledge	45. Accountability 46. Confident 47. Decisive 48. Democratic 49. Empathy 50. Environmental justice 51. Interdependency 52. Openness to novelty and change 53. Optimism 54. Organised 55. Respect and care for the community	1. Discuss the basic terminology and core concepts of environmental sciences. 2. Identify the physical, chemical, biological, political and economic dimensions of environment. 3. Conduct survey of environmental systems, human interactions with them and the use of distinctive areas on Earth. 4. Identify the risks of the degradation of environment. 5. Question the relation between sustainable development and clean environment. 6. Anticipate possible future environmental change and possible development consequences.

28. Policies and regulation 29. Technology and innovation 30. Consumer habits 31. Anticipation and monitoring 32. Environmental awareness 33. Environmental management 34. Green products/design 35. Green growth	44. Motivate and manage change 45. Networked learning 46. Prioritising 47. Problem solving 48. Resolve ethical dilemmas 49. Scenario analysis and planning 50. Team management	56. Respect for diversity 57. Social cohesion 58. Social responsibility 59. Social Justice 60. Basic human needs 61. Human rights 62. Sense of urgency 63. Health care 64. Inclusive participation	7. Appreciate the positive impacts of reasonable use of environmental resources. 8. Demonstrate knowledge and understanding of relationship between poverty and unsafe environment. 9. Use the different tools and equipments to conduct survey of environmental systems, human interactions with them and the use of distinctive areas on Earth. 10. Appreciate the importance of the biosphere through the study of the natural state of ecosystems.

Course Syllabus

Course Number:

Basics of Environmental Sciences

University of Port Said, Faculty of Science, Department of Environmental Sciences, Spring Semester

Instructor Information

Instructor:
Office Location: Faculty of Science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Basics of Environmental Sciences**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

This course provides an interdisciplinary survey of environmental and resources studies, examining its physical, chemical, biological, political and economic dimensions. Emphasis will be on concepts and methods that can be applied to the analysis and understanding of a range of specific environmental problems. A survey of environmental systems, human interactions with them and the use of distinctive areas on Earth are introduced. Emphasis is on environmental concepts, problems, and research methods in Egypt. This course examines the dynamics of the biosphere through the study of the natural state of ecosystems. Emphasis is on the explanation of the relationships between organisms and their environment and on managing human and water resources. In short, the course provides an appropriate chance for the students to get the minimum knowledge of safe environment.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of environmental and resources studies; b) to raise awareness of the learners about the need to examine physical, chemical, biological, political and economic dimensions of environment; c) emphasize on concepts and methods that can be applied to the analysis and understanding of a range of specific environmental problems; d) help learners to conduct survey of environmental systems, human interactions with them and the use of distinctive areas on Earth; e) use traditional and electronic tools to identify the risks of the degradation of environment; and f) to highlight the importance of the biosphere through the study of the natural state of ecosystems.

Course Objectives Learning Outcomes

Upon successful completion of this course, students will be able to:

11. Discuss the basic terminology and core concepts of environmental sciences.
12. Identify the physical, chemical, biological, political and economic dimensions of environment.
13. Conduct survey of environmental systems, human interactions with them and the use of distinctive areas on Earth.

14. Identify the risks of the degradation of environment.
15. Question the relation between sustainable development and clean environment.
16. Anticipate possible future environmental change and possible development consequences.
17. Appreciate the positive impacts of reasonable use of environmental resources.
18. Demonstrate knowledge and understanding of relationship between poverty and unsafe environment.
19. Use the different tools and equipments to conduct survey of environmental systems, human interactions with them and the use of distinctive areas on Earth.
20. Appreciate the importance of the biosphere through the study of the natural state of ecosystems.

- **Course Resources**

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Energy Resources and Supply.
3		Renewable energies and clean technologies.
		Solar Energy, solar cells, solar thermal heating systems, and electricity generation.
		Tidal and Hydro as renewable energy resources.
		Renewable Energy Integration and Energy Efficiency in the Built Environment
		Research Design Methods.

CATEGORIZATION OF POTENTIAL COURSES ACCORDING TO THE CONCENTRATION AREA		
Climate Change, Environment and Society	**Climate Change, Economics and Public Policy**	**Climate Change, Sciences and Technology**
1. Rural and urban sociology 2. Introduction to Social Welfare 3. Community health 4. Introduction to Social planning 5. Social work in one of the developed fields 6. Populations and Environmental Studies 7. Environmental studies 8. Principles of Psychology 9. Adult education and environment Work		1-Fish adaptation and climatic change 2-Paleoecology 3- Economic Geology 4- Flora of Egypt 5-Plant community 6-Plant Ecology 7- Ecology and Physiology of Algae 8- Environmental Geology 9- Statistical Biology and Experimental Design 10- History of Engineering and Energy 11- Project management 12- Fundamentals of Thermodynamic 13-Energy conversion and utilization 14-Heat transfer 15-Renewable energy resources 16-Pollution

Description of the Environmental Psychology Course

List of cognitive concepts

Basic competencies	Psychological Traits	Skills	Knowledge
Explains the causes of environmental pollution	Balances between psychological bases and entrances to the interpretation of the relationship between behavior and environment	Uses the Correlation Method	Clarifies the concept of the environment
Uses the Internet and global networks in search for programs of the most important environmental education	Concludes the goals of environmental Education	Displays the causal relationship within the framework of the experimental method	Defines the concept of environmental psychology
Acquires skills of individual's positive personal behavior	Mentions examples of types of pollution in the environment	Masters methods of collecting information and data about the	States the concept of environmental education

		phenomenon studied	
Collects reports and information about people's responses to environmental conditions	Suggests a roadmap for Environmental Action to try to limit environmental pollution	Builds projective tests and measurements	Mentions the concept of environmental education
Communicates with peers to complete assigned work.	Mentions evidence on the existence of pollution in the surroundings	Masters writing self-reports	Explains the concept of perception
Tackles self-dependence in writing research on the role of community in the reduction of environmental pollution	Concludes the negative impact on health, resulting from water pollution	Identifies the causes that lead to the occurrence or non-occurrence of a phenomenon in the context of the Descriptive Method	Enumerates the concept of environmental perception
Acquires skills of positive behavior towards the environment	Discusses ways of changing psychological attitudes toward environment	Plans to explain how difficult it is to apply the scientific method and experimental control	Clarifies principles of learning

Draws a comprehensive blueprint for the most important types of environmental pollution that resulted in climatic changes in the world	Proposes new methods to help parents raise children properly	Criticize the conduct of laboratory experiments in environmental psychology	Mentions the theoretical bases of the interpretation of the relationship between the environment and behavior

*** Study Plan for the course:**

Course number: ……..
Course Name: Environmental Psychology
Semester: ……..

*** Information about the instructor:**

- Instructor's Name: ……..
- Location and Office Number: ……
- Tel: ……
- Office Hours: ……
- E-mail: ……..
- Website: ……

* Definition of the course:
- Course No.:

- Course Title: Environmental Psychology
- Place:
- Timing of the lectures:
- Prerequisite:
- College Website:

*** Brief description of the course: (about 15 lines)**

The course of environmental psychology includes the following:
Chapter one: includes definition of environmental psychology, its topics, scientific methods, and the necessity that led to its emergence. Chapter two depends on developing positive behavior towards the environment and all fields in which we can improve human behavior regarding environmental issues. This means a paramount necessity for the existence of the so-called environmental instruction and environmental education in addition to causes that led to the failure of all environmental educational programs in Arab societies. The proof of this is the suffering of the environment around us from many problems, including problems of pollution, wastes, water and energy saving. In chapter three, we can recognize the psychology of environment, study its psychological and health effects on human society, and know the sources and causes of environmental pollution. Chapter four deals with ways to cure problems of the environment through the role the community and university play in the development and improvement of environment in the fight against pollution. Chapter five contains presentation of the theoretical foundations and introductions that constitute the relationship between the environment and human behavior, the formation of environmental perception and factors that affect this perception, environmental trends, and the role of the principles of learning in their composition and how they are measured.

*** Learning outcomes included in the Content; derived from the list of concepts:**

- Mention the theoretical foundations for the interpretation of the relationship between the environment and behavior.
- Explain the causes of environmental pollution.
- Acquire the skills of positive behavior towards the environment.

- Draw a comprehensive blueprint for the most serious types of pollution in the environment, which resulted in climatic changes in the world.

- Discuss ways of changing psychological attitudes toward environment.

* A list of learning sources:

فرانسيس ماك أندرو (2002). علم النفس البيئي، ترجمة: عبد اللطيف محمد خليفة، جمعة سيد يوسف، مطبوعات جامعة الكويت، الكويت.

- عبد الرحمن محمد عيسوي (1997). في علم النفس البيئي، منشأة المعارف، الإسكندرية.

- طلعت منصور غبريال (1982). البيئة والسلوك، حوليات كلية الآداب، جامعة الكويت، الحولية رقم (3)

- بين البيئة والسلوك البشري، الطبعة الأولى، الكويت، دار البحوث العلمية على عسكر، محمد الأنصاري (1993). علم النفس البيئي: تفسير نفسي للعلاقة.

- مهنا محمد غنايم (1988) من أساليب التربية البيئية في المضمون المدرسي، ندوة الإنسان والبيئة، مكتب التربية لدول الخليج، ص 76.

- والعلوم، تونس لمراحل التعليم العام في الوطن العربي ، المنظمة العربية للتربية والثقافة محمد صابر سليم، (1988) "المفاهيم الأساسية" مرجع في التعليم البيئي

- الثانوية، رسالة دكتوراه غير منشورة، والمتغيرات النفسية والاجتماعية في السلوك البيئي لدى طلاب المرحلة طارق على محمود على (2002) . أثر الوعي البيئي بالإسماعيلية، جامعة قناة السويس مودعة مكتبة كلية التربية.

- نظيفة أحمد سرحان (2005). منهاج الخدمة الاجتماعية لحماية البيئة من التلوث، دار الفكر العربي، القاهرة.

- Websites linked to the course:

http://pubcouncil.kuniv.edu.kw/aass/homear.aspx?id=8&Root=yes&authid=469
http://www.ektab.com/

- Texts and instructional materials necessary for the course:

*** Assignments and methods of Assessment:**

- Assessment will be graded on a scale of zero to 10 marks, and the degree of success starts at 50% or 60%
- Assessment Policy

Assignments	80

Tests	----
Attendance and participation	20
Total	100

*** Policies adopted in teaching the course:**

- Delays in the delivery of assignments?!
- Methods or **(policies)** of classroom management:
- Dealing with learners with disabilities:

*** Timetable of lectures (lessons):**

Week	Date	Subject
One & Two		Environmental Psychology: definition, theme and methods
Three & Four		The development of positive behavior towards the environment
Five & Six		Psychology of the environment, and its health and psychological effects
Seven & Eight		Ways to solve environmental problems

Nine & Ten		Theoretical bases that explain the relationship between environment and behavioral - environmental perception
Eleven & Twelve		Environmental attitudes
Thirteen & fourteen		Suggested activities

*** Guiding model for course modules**

Module I: Environmental Psychology: definition, themes, and methods

- The basic concepts of the module: concept of the environment - concept of environmental psychology
- A brief description of the Module: definition of the environment and its types, topics of environmental psychology and necessity that led to its emergence, curricula used in it, and what characterizes it
- Module goal: is to identify the environment and its types, and environmental psychology as a science that should be studied
- Learning Outcomes: It is expected that the student will be, after the completion of the lesson, able to:

(A) state the concept of environmental psychology.
(B) discuss the necessity that led to the emergence of environmental psychology.
(C) clarify the curricula used in the study of environmental psychology with no errors.

*** Activities**

1. Visiting the Association and the Council of Environmental Protection, and attempting to execute their objectives
2. Designing or developing a program for environmental awareness

3 Picking pictures out of newspapers and magazines, and analyzing their content, then comparing among them in terms of their expected impact
4. Coming up with the concept of each of these four words: information - fact - law - theory
5. Choosing one of the theories of psychology, and the stages of concluding it.
6. Student presents: what s/he feels, and how s/he behaves when s/he faces one of the situations mentioned in the introductions assigned for the interpretation of the relationship between environment and behavior, for his/her peers.
7. A student presents one of the situations in which s/he feels adapted, and the ones in which s/he lacks his/her ability, and compares between the causes of each feeling.
8 What is the relationship among the following processes: sensation, attention, perception?
9 In one situation, different individuals develop different perceptions. Explain via environmental situations you have experienced?
10 Students' choice of two environmentally different residential areas and recording the reaction of the population at the time of the processes of repair in their streets for a relatively long period; perspective of the student to express his/her opinion is to be taken into account.
11. Posing an open-ended question on at least ten members whether they are aware of the dangers threatening the environment in which they are present
12 Making a comparison between the four different definitions of psychological attitude, using a number of references
13. The attitude of student may change towards an a particular environmental or social issue, and then s/he identifies the factors that were behind the change.
14. Concluding the relationship between programs that some candidates present and voters' attitudes in certain areas.
15. Thinking in a certain way to get to know the attitudes of population of the local environment towards a large project will lead to a comprehensive environmental change.

Additional sources for reading

- فرانسيس ماك أندرو (2002). علم النفس البيئي، ترجمة: عبد اللطيف محمد خليفة، جمعة سيد يوسف، مطبوعات جامعة الكويت، الكويت.
- عبد الرحمن محمد عيسوي (1997). في علم النفس البيئي، منشأة المعارف، الإسكندرية.

-)طلعت منصور غبريال (1982). البيئة والسلوك، حوليات كلية الآداب، جامعة الكويت، الحولية رقم (3
- بين البيئة والسلوك البشري، الطبعة الأولى، الكويت، دار البحوث العلمية على عسكر، محمد الأنصاري (1993). علم النفس البيئي: تفسير نفسي للعلاقة.
- مهنا محمد غنايم (1988) من أساليب التربية البيئية في المضمون المدرسي، ندوة الإنسان والبيئة، مكتب التربية لدول الخليج، ص 76.
- والعلوم، تونس لمراحل التعليم العام في الوطن العربي ، المنظمة العربية للتربية والثقافة محمد صابر سليم، (1988) "المفاهيم الأساسية" مرجع في التعليم البيئي
- الثانوية، رسالة دكتوراه غير منشورة، مودعة مكتبة كلية والمتغيرات النفسية والاجتماعية في السلوك البيئي لدى طلاب المرحلة طارق على محمود على (2002) . أثر الوعي البيئي بالإسماعيلية، جامعة قناة السويس التربية.
- نظيفة أحمد سرحان (2005). منهاج الخدمة الاجتماعية لحماية البيئة من التلوث، دار الفكر العربي، القاهرة.

Activities and assignments performed by student are to be written inside the auditorium to achieve the objectives of the module.

Example: Reading an article on a subject of a module and summarizing it in English, then translating the summary into Arabic, and finally presenting it to discussion with student's peers.

Dr. Hesham El-Nersh
Assistant Educational Psychology professor
Faculty of Education
Port Said University

Energy and Environment

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
36. Environmental awareness 37. Climate change communication 38. Fairness and climate change justice 39. Future climate change scenarios 40. Strategic planning 41. Integrated assessment 42. Environmental awareness 43. Environmental management 44. Gender and climate change 45. Climate change policy 46. Climate change adaptation 47. Risk assessment 48. Climate variability 49. Climate change communication 50. Climate change and health	51. Adaptive learning and self-reflection; 52. Awareness and advocacy raising 53. Communicating 54. Contextualising 55. Critical, systemic and futures thinking 56. Debating 57. Discourse 58. Futures thinking 59. Integrated assessment 60. Leadership 61. Local knowledge 62. Mapping gender impacts 63. Motivate and manage change 64. Networked learning 65. Prioritising	65. Accountability 66. Confident 67. Decisive 68. Democratic 69. Empathy 70. Environmental justice 71. Interdependency 72. Openness to novelty and change 73. Optimism 74. Organised 75. Respect and care for the community 76. Respect for diversity 77. Social cohesion 78. Social responsibility	21. Discuss the basic terminology and core concepts of energy. 22. Identify the impacts of traditional energy resources on environment. 23. Compare the advantages and disadvantages of different energy resources. 24. Understand the basic principles of production, conversion, storage and transmission of energy. 25. Question the relation between sustainable development and the use of energy resources. 26. Identify the different types of pollution sources. 27. Anticipate possible future environmental change and identify possible development consequences. 28. Appreciate the positive impacts of utilizing renewable energy resources on the environment. 29. Demonstrate knowledge and understanding of

51. Strategic planning and climate change 52. Role of international institutions	66. Problem solving 67. Resolve ethical dilemmas 68. Scenario analysis and planning 69. Team management		relationship between poverty, environment, climate change, and the insufficient supply of energy. 30. Use the different tools and equipments of pollution measurements. 31. Recognize the availability of solar, wind, hydroelectric and nuclear energy resources in Egypt.

Course Syllabus

Course Number:

Energy and Environment

University of Port Said, Faculty of Science, Department of Environmental Sciences, Fall Semester

Instructor Information

Instructor:
Office Location: Faculty of Science Campus
Telephone: Office –
Office Hours:
E-mail: dsabdelaty@yahoo.com
Website:

Course Identification

Course Number:
Course Name: **energy and environment**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page: www.sci.psu.edu.eg

Course Description/Overview

The present course is intended to raise the students' awareness of energy consumption and environmental pollution. It presents a discussion of the scientific principles of energy and thermodynamics, and the current and future prospects for energy production, conversion, storage and transmission. It also discusses the availability of solar energy, wind energy, hydroelectric energy and nuclear energy. It introduces students to the benefits of using clean energy resources. It does so through tackling the following aspects: 1) environmental pollution energy resources; 2) impact of energy consumption on environment; 3); 4) clean energy resources and climate change; 5) air, thermal and nuclear pollution; and 6) energy consumption, current and future global climate change. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is they are asked to read and summarize articles on renewable energy resources. They are invited to discuss impacts of energy resources on environment at local, national and international scales.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of energy production, conversion, storage and transmission; b) to raise awareness of the learners about the need to explore clean energy resources to achieve the goals of sustainable development; c) help learners use traditional and electronic tools to identify the risks of pollution a result of increasing consumption of petroleum and gas; and d) to highlight the importance of controlling energy resources consumption as clean and safe resources to the environment.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Discuss the basic terminology and core concepts of energy.
2. Identify the impacts of traditional energy resources on environment.
3. Compare the advantages and disadvantages of different energy resources.
4. Understand the basic principles of production, conversion, storage and transmission of energy.

5. Question the relation between sustainable development and the use of energy resources.
6. Identify the different types of pollution sources.
7. Anticipate possible future environmental change and identify possible development consequences.
8. Appreciate the positive impacts of utilizing renewable energy resources on the environment.
9. Demonstrate knowledge and understanding of relationship between poverty, environment, climate change, and the insufficient supply of energy.
10. Use the different tools and equipments of pollution measurements.
11. Recognize the availability of solar, wind, hydroelectric and nuclear energy resources in Egypt.

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Energy Resources and Supply.
3		Renewable energies and clean technologies.
		Solar Energy, solar cells, solar thermal heating systems, and electricity generation.
		Tidal and Hydro as renewable energy resources.
		Renewable Energy Integration and Energy Efficiency in the Built Environment
		Research Design Methods.

Environmental Studies

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
53. Weather and climate 54. Climate change and livelihoods 55. Gender-sensitive response to climate change 56. Climate change communication 57. Fairness and climate change justice 58. Future climate change scenarios 59. Risk assessment 60. Climate variability 61. Weather and climate 62. Migration & climate	70. Adaptive learning and self-reflection; 71. Awareness and advocacy raising 72. Carbon literacy for procurement 73. Communicating 74. Contextualising 75. Critical, systemic and futures thinking 76. Debating 77. Discourse 78. Emergency psychology 79. Futures thinking 80. Global dynamics 81. Integrated assessment	79. Accountability 80. Confident 81. Decisive 82. Democratic 83. Empathy 84. Environmental justice 85. Gender-sensitive 86. Global mind-set/ consciousness 87. Interdependency 88. Needs vs. wants 89. Nonviolence & peace 90. Openness to novelty and change 91. Optimism	1. Develop an understanding based on observation and illustration, drawn from lived experiences and physical, biological, social and cultural aspects of life, rather than abstractions; 2. Create cognitive capacity and resourcefulness to make the child curious about social phenomena, starting with the family and moving on to wider spaces; 3. Engage the child in exploratory and hands-on activities to acquire basic cognitive and psychomotor skills through observation, classification, inference, etc.; 4. Critically address gender concerns and issues of

change 63. Climate change communication 64. Mainstreaming and planning 65. Spatial decision tools 66. Conflict resolution 67. Occupational health and safety issues 68. Water management and recycling 69. Environmental awareness 70. Environmental management 71. Environmental economics 72. Environmental law 73. Environment and governance 74. Economics and growth 75. Environmental awareness 76. Environmental ethics 77. Role of international institutions	82. Leadership 83. Local knowledge 84. Mapping gender impacts 85. Motivate and manage change 86. Networked learning 87. Prioritising 88. Problem solving 89. Resolve ethical dilemmas 90. Scenario analysis and planning 91. Team management	92. Organised 93. Respect and care for the community 94. Respect for diversity 95. Social cohesion 96. Social responsibility 97. Stewardship 98. Tolerance 99. Transparency 100. Virtue	marginalisation and oppression with values of equality and justice, and respect for human dignity and rights

Course Syllabus

Course Number:

Environmental Studies

University of Port Said, Faculty of Science,
Faculty Requirement

2013-2014

Instructor Information

Instructor: Dr
Office Location: Faculty of Science Campus
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:

Course Name: **Environmental Studies**
Course Location: University Campus
Class Times:
Prerequisites:
Faculty Web Page:

Course Description/Overview

The present course aims to equip students to integrate an understanding of the environment with other academic fields and their personal life. It prepares students for meaningful lifetime engagement with the environmental challenges that are facing society. This course emphasizes active, interdisciplinary learning with the overall objective of instilling the necessary skills to conserve biodiversity and integrate the principles of sustainability with respect to management of complex environmental systems. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is they are asked to read and summarize articles on environmental issues.

Course Learning Objectives

The overarching goals of this course are: a) to develop an awareness about environmental issues; b) to train students to locate and comprehend relationships between the natural, social and cultural environment; and c) nurture the curiosity and creativity of the student particularly in relation to the natural environment (including artifacts and people);

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

5. Develop an understanding based on observation and illustration, drawn from lived experiences and physical, biological, social and cultural aspects of life, rather than abstractions;

6. Create cognitive capacity and resourcefulness to make the child curious about social phenomena, starting with the family and moving on to wider spaces;

7. Engage the child in exploratory and hands-on activities to acquire basic cognitive and psychomotor skills through observation, classification, inference, etc.;

8. Critically address gender concerns and issues of marginalisation and oppression with values of equality and justice, and respect for human dignity and rights

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Environmental definitions and components: aatmosphere, layers, limitations, definitions, characteristics, processes and benefits
3		Air Pollution: Definitions, limitation, causes, types.
4		Hydrosphere: oceans, seas, lakes, rivers and underground water; definitions, limitations, water quality. Water Pollution: definition - major pollutant- sources, transport path, dynamics& treatment.
5		Marine pollution, thermal pollution, radioactive pollution, sewage pollution, heavy metal pollution, pesticides, solid wastes. toxicology, treatments & management.
6		Environmental protection: limitations, methods; monitoring, management & conservation activities. Protected Areas (PAs) & coastal protection. Global climate changes: causes, limitations, worldwide & local; Sea level changes, weather changes; temperature rise, rainfall regime changes, Acid rains & Ocean acidification.

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number:

Environmental Education Anthropology

Port Said University, Faculty of Education, Department of Foundations of Education,

Instructor Information

Instructor: Dr. Mohamed Maher Mahmoud Hanafy
Office Location: Port Said University - Egypt
Telephone: 01224729050
Office Hours:
E-mail: maher_doctor@yahoo.com
Website:

Course Identification

Course Number:
Course Name: Environmental Education Anthropology
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

Anthropology is interested in studying human, like other human sciences, which are closely linked to the humanitarian community in which they exist, they reflect its core values prevailing in it, and then help the community improvement and development, the study of environmental and climatic changes has become one of the social sciences and humanities concerns, which including the Anthropology, some of the recent trends in environmental studies, anthropological have been occurred , and these trends study the human adaptive with global environmental changes and developing solutions to many of the environmental problems, and this course shows the nature of the relationship between Anthropology and climate change as the results for man's behavior towards his environment, the course has been divided into five sections: the first section entitled "what is Anthropology," this section deals with the concept of Anthropology, and its objectives, and scope, and its relations to other sciences, the second section entitled "environmental Education", and deals with the concept of environmental education, its goals, and the process of environmental awareness, the third section titled "global climate changes, current and future," it deals with the most important global climate changes, and then the fourth section entitled "The harms of climate changes," it deals with harms of climatic changes and their impact on human health and the physical and natural environment, and finally the fifth section entitled "Mechanisms of the development of environmental awareness

among members of the community" by clarifying the role of formal and informal educational institutions in achieving and reduce environmental harms from climate changes.

Course Learning Objectives

The overarching goals of this course are:
1- Identify the communities cultures and behaviors towards climate changes.
2 Monitor the most important risks of climate changes on the environment and humans.
3 Raise the level of community awareness towards the dangers and harms of climate changes.
4 providing a critical study of the individuals behaviors to various climatic changes.
5. Activating the role of formal and informal educational institutions, in achieving and reduce environmental harms from climate change.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Define the concept of Anthropology and its most important fields and objectives.
2. Clarify the relationship between Anthropology and other sciences.
3. Comparison between the fields of anthropological studies.
4. Show the awareness of global climate changes.
5. Benefit from the programs of educational institutions in modifying the behavior of individuals towards the environment.
6. Develop proposals for how to deal with global climate changes.

Course Resources

Course Website(s)

Required Course Texts and Materials

1. Hassan Mohammed Hassan: Anthropology of Education and the education problems of the big cities, dar althkafa, Cairo, 1980.
2. Mohammed Abbas Ibrahim: The Sub-Culture, dar almearfa algameia, Alexandria 1985.
3. Mohammed El-gohary: anthropology, The Theory Founded and Practical Applications, dar almearfa algameia, Alexandria 0.2005 m.
4. Yahya Badr Morsi Eid: Anthropology Origins, , dar alwafaa, Alexandria , 2007 m.
5. Isa AlShmas: Introduction to Anthropology (Anthropology), the Arab Writers Union, Damascus , 2004 m.
6. Farooq Ahmed Mustafa: Introduction and Antrbeological studies, dar almearfa algameia. Alexandria, 1989 m.
7. Ahmed Hussein ALLaqany and Fareaa Hassan Mohamed: Environmental education , The Duty and the Responsibility, the world of books, Cairo, 1999.
8. Edward Pritchard: Social Anthropology, translation: Ahmed Abu Zaid, the fifth edition, the Egyptian General Book, 1975 m.
9. Assem Shehabi: The Impact of Climate Changes on Human Health, http://www.philadelphia.edu.jo/philadreview/issue5/no5/22.pdf
10. Essam El-Din Hilal : Environmental Education, the Egyptian General Book, Cairo, 2007.
11. Sabri Eldemerdash: environmental education, model, investigation, and Calendar, Knowledge House, Cairo, 1988.
12. Mohammed elsayed Arnaout: human and environmental pollution, Egyptian-Lebanese house, Cairo, 1993.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	40%
Exams	40%
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class

starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		The concept of Anthropology- inception - objectives - fields
3		Relationship between Anthropology and other scienc
4		The concept of environmental education and its goals

5		The Current and Future Global Climate Changes
6		The Harms of Climate Changes on the Natural Environment
7		The Harms of Climate Changes on the physical environment
8		The Harms of Climate Changes on human health
9		The role of formal educational institutions in raising awareness of the climate changes harms and reduce it.
10		The role of informal educational institutions in raising awareness of the climate changes harms and reduce it.
11		The role of technology in reducing the harms of climate changes
12		Activation of social networking sites to modify some of the behaviors that cause climate changes through action or animated videos and other.

APENDIX II: The CLIMASP Course Modules Template Example

Course	**Environmental Education Anthropology**
Module 1	Curriculum: What is Anthropology
Key Concepts	Anthropology and its goals , fields and types
Overview	This Module appears Introduction to Anthropology and its importance in the study of the cultural history of human society, and the most important areas that concerned and its relationship to other sciences.
Aim	The main objective of this Module to know the nature of science Anthropology and its relationship to human behaviors, which is the main reason for the occurrence of climatic changes.
Learning Outcomes	At the end of this module learners will be able to: Identify the concept and the nature of Anthropology. Compare between the different areas of anthropology. Clarify the relationship of Anthropology and other sciences.
Units	Unit 1.1 Anthropology (concept, objectives and fields) Unit 1.2: The Relationship between Anthropology and of

	sciences.
Readings	Fulya Damla Kentli (2009). Comparison of hidden curriculum theories. European Journal of Educational Studies 1 (2) 83-88. Grundy, S. (1987) *Curriculum: Product or Praxis*, Lewes: Falmer Aristotle (1976) *The Nicomachean Ethics* ('Ethics'), Harmondsworth: Penguin. Chapter 3: Curriculum Theory. http://www.sagepub.com/upm-data/6042_Chapter_3_Glatthorn_(Sage)_I_Proof_2.pdf Watson, D. (2001). Pedagogy before technology: Re-thinking the relationship between ICT and teaching. Education and Information Technologies 6:4, 251–266
Activity	Writing an essay about the role of Anthropology in studying the human culture throughout the ages.
Module 2	Environmental Education
Key Concepts	Environmental Education- population
Overview	This Module appears the nature of environmental education and its most important fields, and objectives, and how to use technology

	in the preservation of the environment.
Aim	The objective of this Module is knowing the concept of environmental education and its objectives, and to clarify the impact of population activities on the environment, as well as to provide students with some practices associated with environmental education, and how to use technology to preserve them.
Learning Outcomes	• At the end of this module learners will be able to: • Define the concept of environmental education and goals. • Knowing the global efforts towards the preservation of the environment. • Optimize the use of technology to solve environmental problems. • Diagnosis of the current situation of environmental pollution.
Units	Unit 2.1: Environmental Education (concept - targets). Unit 2.2: The role of technology in preserving the environment. Unit 2.3: The global efforts to preserve the environment
Readings	Magdy Aziz Ibrahim: environmental education in the curricula of public education, the Anglo-Egyptian Library, Cairo, 2001.
Activity	**Overview**
	1-View documentary film about how to recycle waste. 2-Implementation workshops on how to recycle waste

	3-Conducting field research on the most important aspects of environmental pollution in the local community. 4-Implementation of a forestation campaigns for the local community to reduce air pollution.
Module 3	Climate changes
Key Concepts	Climate changes
Overview	This Module appears the nature of climate changes and the most important forms and causes, and the role of human behavior in its occurrence.
Aim	This module aims at knowing the forms of climate changes and its most important reasons, and the most important international practices relating to the policies of adaptation to climate changes and mitigation.
Learning Outcomes	At the end of this module learners will be able to: • Identify the causes of climate changes. • Compare the best international practices on adaptation to climate changes and mitigation.

Units	Unit 3.1: Climate change: forms and causes Unit 3.2: The International practices to adapt to climate change and reduce its impact.
Readings	Abdul Wahab Bin Rajab Hashim bin Sadiq: Environmental Crimes and ways of confrontation, the Center for Studies and Research, Naif Arab University for Security Sciences, Riyadh, 2006.
Activity	Make Atlas illustrates the most important of climate changes forms, its causes and the most affected areas by them.
Module 4	The harms of climate changes
Key Concepts	harms of climate changes
Overview	This Module appears the harms of climate changes on the physical and natural environment and human health, and revenge on the countries' economies and food security.
Aim	The overriding aim of this module is to study the impact of climate changes on human and natural and physical environment.
Learning Outcomes	At the end of this module learners will be able to: • Identify the harms of climate changes. • Educate communities with the climate changes effects
Units	Unit 3.1: The Harm of climate change on human health. Unit 3.2: The Harm of climate change on physical environment

	Unit 3.3: The Harm of climate change on natural environment
Readings	1- Ahmed Midhat Islam: the problem of environmental pollution era, wrote a series of monthly issued by the National Council for Culture, Arts and Letters, the world of knowledge, Kuwait, 1990. 2- Rachid Salmi: the impact of environmental pollution in economic development in Algeria, Ph.D. thesis, Faculty of Economic Sciences of management, University of Algiers 2006. 3- Mohamed Mahmoud Sergani: liability for environmental damage, a comparative study between international law and Islamic law, Umm Al-Qura University Journal of Educational Sciences, social, humanitarian, first edition, Volume XIII, presses Umm Al Qura University, Mecca, in January 2001
Activity	**Overview**
	Make field research on the most important harms of climate changes in the community.
Module 5	Mechanisms for the development of environmental awareness among members of the community
Key Concepts	environmental awareness

Overview	This Module appears the mechanisms development of environmental awareness to members of the community and reduce harms of the climate changes through activating the role of formal educational institutions (schools and universities) and informal (family - the media - civil society organizations).
Aim	The overriding aim of this module is to raise the level of environmental awareness among students is to help them adapt to climate change and the reduction of increasing severity.
Learning Outcomes	At the end of this module learners will be able to: • Define the role of formal and informal educational institutions, in developing the environmental awareness among members of the community. • practice patterns behaviors aimed at adapting to climate change and work on mitigation
Units	Unit 5.1: - The role of formal educational institutions in limiting the harms of climate changes. Unit 5.2: The role of informal educational institutions in limiting the harms of climate changes.
Readings	Najib Saab: the environment in the Arab media, the first Arab Media Forum for Environment and Sustainable Development,

	Cairo, 2006.
Activity	**Overview**
	Designing educational videos shows the harms of climate changes and how to deal with it. Designing Videos emphasizes the rejection of wrong behaviors that cause climate change.

Environmental Microbiology

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
78. Environmental awareness 79. Climate change communication 80. Fairness and climate change justice 81. Future climate change scenarios 82. Technology and innovation 83. Climate change implications for integrated coastal planning 84. Risk assessment 85. Climate variability 86. Climate change communication 87. Climate change and health 88. Strategic planning and climate change 89. Role of international institutions 90. Climate change: Science, impacts & scenarios 91. Future climate change scenarios	92. Adaptive learning and self-reflection; 93. Awareness and advocacy raising 94. Communicating 95. Contextualising 96. Critical, systemic and futures thinking 97. Debating 98. Discourse 99. Futures thinking 100. Integrated assessment 101. Leadership 102. Local knowledge 103. Motivate and manage change 104. Networked learning 105. Prioritising 106. Problem solving 107. Resolve ethical dilemmas 108. Scenario analysis and planning 109. Team management	101. Accountability 102. Confident 103. Decisive 104. Democratic 105. Empathy 106. Environmental justice 107. Openness to novelty and change 108. Optimism 109. Organised 110. Respect and care for the community 111. Respect for diversity 112. Social responsibility 113. Transparency 114. Sense of urgency 115. Human wellbeing 116. Human rights 117. Social responsibility 118. Perspective 119. Co-responsibility 120. Systematic	1) Discuss current environmental issues with an understanding of the basic ecological concepts involved. 2) Use an interdisciplinary approach to analyze environmental issues/problems; show knowledge of the interplay between the ecological, political, social, cultural and economic aspects of environmental problems. 3) Develop a worldview related to an understanding of current environmental issues and how global problems affect us locally. 4) Demonstrate an understanding of core ecological principles, and define scientific principles and concepts as related to environmental studies and sustainability. 5) Participate in basic field ecology research and experiments according to the scientific method.

		121. Focussed	

Course Syllabus

Course Number:

Environmental Microbiology

Port Said University, Faculty of science, Department of Environmental Sciences, Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Environmental Microbiology**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

This course introduces environmental processes and the influence of human activities upon them. Topics include environmental sustainability, ecology and evolution, population growth, natural resources, and a focus on current environmental problems from scientific, social, political, and economic perspectives. Upon completion, students should be able to demonstrate an understanding of environmental interrelationships and of contemporary environmental issues. This course has been approved to satisfy the Comprehensive Articulation Agreement general education core requirement in natural sciences/mathematics.

Course Learning Objectives

The overarching goals of this course are: a) to provide a a broad base of ecosystems biology, environmental microbiology, pollution monitoring, ecotoxicology and environmental biochemistry; b) to raise awareness of the learners about the important aspects of ecosystems and biodiversity, evolution, animal and plant physiology, environmental microbiology and molecular and cellular biology; c) and help learners Prepare for a careers in such field as environmental protection, research, consultancy and ecosystems management.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1) Discuss current environmental issues with an understanding of the basic ecological concepts involved.
2) Use an interdisciplinary approach to analyze environmental issues/problems; show
knowledge of the interplay between the ecological, political, social, cultural and economic aspects of environmental problems.
3) Develop a worldview related to an understanding of current environmental issues and how global problems affect us locally.

4) Demonstrate an understanding of core ecological principles, and define scientific principles and concepts as related to environmental studies and sustainability.
5) Participate in basic field ecology research and experiments according to the scientific method.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		The Biosphere.
3		Environmental Resources
4		Environmental Threats
5		*Environmental Biology and Public Policy*
6		Skills in Biological Investigation and Experimentation

Environmental Sciences

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
1. Environmental awareness 2. Environmental ethics 3. Biodiversity and climate change 4. Climate change adaptation 5. Urbanization's role in climate change 6. Water resources and climate change Social learning processes 7. Water management and recycling	1. Adaptive learning and self-reflection; 2. Awareness and advocacy raising 3. Carbon literacy for procurement 4. Communicating 5. Contextualising 6. Critical, systemic and futures thinking 7. Debating 8. Discourse 9. Emergency psychology 10. Futures thinking 11. Global dynamics 12. Integrated assessment 13. Leadership 14. Local knowledge 15. Mapping gender impacts 16. Motivate and manage change 17. Networked learning 18. Prioritising	1. Accountability 2. Confident 3. Decisive 4. Democratic 5. Empathy 6. Environmental justice 7. Gender-sensitive 8. Global mind-set/ consciousness 9. Interdependency 10. Needs vs. wants 11. Nonviolence & peace 12. Openness to novelty and change 13. Optimism 14. Organised 15. Respect and care for the community 16. Respect for diversity 17. Social cohesion 18. Social responsibility 19. Stewardship	1. Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community. 2. Analyse methods of ensuring local participation in climate change adaptation. 3. Analyze the effects of climate change from both male and female perspectives 4. Compare and contrast the impacts of major climatic hazards on livelihoods of the community. 5. Comprehend the significance of the climate change problem locally and globally. 6. Describe the relationship between human activities and climate change. 7. Demonstrate an understanding of the natural carbon cycle. 8. Explore solutions to problems that cause climate change. 9. Identify ways to reduce the school's carbon footprint. 10. Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in.

	19. Problem solving 20. Resolve ethical dilemmas 21. Scenario analysis and planning 22. Team management	20. Tolerance 21. Transparency 22. Virtue	11. Investigate the causes of climate change. 12. Propose solutions to climate change issues. 13. Understand how human actions are contributing to global environmental change.

Course Syllabus

Course Number:

Environmental Sciences

University of Port Said, Faculty of Education, Department of Curricula and Methods of Teaching,

Fall Semester, 2013-2014

Instructor Information

Instructor: Dr Mahmoud Mohasseb
Office Location: Faculty of Education Campus
Telephone: Office –
Office Hours: Tuesday 14.30- 17.00, Wednsday 14.00 – 16.00
E-mail:
Website:

Course Identification

Course Number: **Γ0**
Course Name: **Environmental Sciences**
Course Location: University Campus
Class Times: Wednesday 8:30pm – 11:30am

Prerequisites:
Faculty Web Page:

Course Description/Overview

Education can be the catalyst for empowering students to become critical, reflective and active citizens. Teachers have the potential to be what Giroux and McLaren described as transformative intellectuals who combine scholarly reflection and practice in the service of educating students to be thoughtful, active citizens. The present course is intended to raise the students' environmental awareness. It introduces them to the environmental challenges resulting from climate change. It does so through tackling the following logically sequenced seven issues: 1) Environmental awareness; 2)Environmental ethics; 3) Biodiversity and climate change; 4) Climate change adaptation; 5) Urbanization's role in climate change; 6) Water resources and climate change Social learning processes; and 7) Water management and recycling. Issues 5-7 are, however, deeply covered through active participation of the students. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is, they are asked to read and summarize articles on climate changes. They are invited to discuss scenarios for the management of water resources at local, national and international scales. In short, the course provides an appropriate chance for the students practice their role as future citizens.

Course Learning Objectives

The overarching goals of this course are: a) to provide a critical approach to the negative environmental consequences of climate changes – at local, national and international scales - in the context of education for sustainability; b) raise awareness of the role of the learners to reflect critically on the rights, roles and responsibilities of an active citizen in preparing for the management of critical environmental issues; and c) use traditional and electronic resources as well as social networking technologies as tools to help the community, including children, identify risks and develop climate change adaptation strategies.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

- Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community.
- Analyse methods of ensuring local participation in climate change adaptation.
- Analyze the effects of climate change from both male and female perspectives
- Compare and contrast the impacts of major climatic hazards on livelihoods of the community.
- Comprehend the significance of the climate change problem locally and globally.
- Describe the relationship between human activities and climate change.
- Demonstrate an understanding of the natural carbon cycle.
- Explore solutions to problems that cause climate change.
- Identify ways to reduce the school's carbon footprint.
- Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in.
- Investigate the causes of climate change.
- Propose solutions to climate change issues.
- Understand how human actions are contributing to global environmental change. Course Resources

Course Website(s)

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class
- Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness &id=7141986**
- **Paul Pojman** Environmental Ethics: Readings in Theory and Application Paperback – January 1, 2007
- Oxford Dictionary of Philosophy: environmental ethics, **http://www.answers**. com/topic/environmental-ethics
- Shah, Anup. "Biodiversity." *Global Issues*. 19 Jan. 2014. Web. 10 Sep. 2014. <http://www.globalissues.org/issue/169/biodiversity>.
- Doucet, C. (2007) *Urban Meltdown: Cities, Climate Change and Politics as Usual*, New Society Publishers, Gabriola Island BC.
- Dow, K. and Downing, T. (2006) *The Atlas of Climate Change: Mapping the World's Greatest Challenge*, University of California Press, Berkeley.
- Flannery, T. (2005) *The Weather Makers: How Man is Changing the Climate and What It Means for Life on Earth*, Atlantic Monthly Press NY.
- Hansen, J. (2010) *Storms of My Grandchildren: The Truth about the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, Bloomsbury, New York.
- Henson, R. (2008) *The Gough Guide to Climate Change: The Symptoms, The Science, The Solutions*, Rough Guides, London.
- Holper, P. and Torok, S. (2008) *Climate Change: What You Can do about It at Work, at Home, at School*, Pan Macmillan,Sydney.
- Hulme, M. (2009) *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*, Cambridge University Press, Cambridge.
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- Moser, S. and Dilling, L. (eds) (2007) *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*, Cambridge University Press, Cambridge.

- United Nations Development Programme (2007) *Fighting Climate Change: Human Solidarity in a Divided World: Human Development Report 2007-2008*, Palgrave Macmillan, Basingstoke, UK.
- *Layperson's Guide to Water Recycling and Reuse*, published in 1992 by the Water Education Foundation, Sacramento, California.
- Video, entitled *Water from Water: Recycling*, produced in 1995 by National Water Research Institute, Fountain Valley, California.
- Research On Recycled Water is done by EPA through the Office of Research and Development.
- Water Recycling and Reuse: The Environmental Benefits http://www.epa. gov/region9/water/recycling/
- CCSP (2008). *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Backlund, P., A. Janetos, D. Schimel, J. Hatfield, K. Boote, P. Fay, L. Hahn, C. Izaurralde, B.A. Kimball, T. Mader, J. Morgan, D. Ort, W. Polley, A. Thomson, D. Wolfe, M. Ryan, S. Archer, R. Birdsey, C. Dahm, L. Heath, J. Hicke, D. Hollinger, T. Huxman, G. Okin, R. Oren, J. Randerson, W. Schlesinger, D. Lettenmaier, D. Major, L. Poff, S. Running, L. Hansen, D. Inouye, B.P. Kelly, L Meyerson, B. Peterson, and R. Shaw. U.S. Environmental Protection Agency, Washington, DC, USA.
- Kundzewicz, Z.W., L.J. Mata, N.W. Arnell, P. Döll, P. Kabat, B. Jiménez, K.A. Miller, T. Oki, Z. Sen, and I.A. Shiklomanov (2007). Freshwater resources and their management. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability* . EXIT Disclaimer *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds.)]. Cambridge University Press, Cambridge, United Kingdom.
- CCSP (2009). *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Titus, J.G. (Coordinating Lead Author), Anderson, K.E., Cahoon, D.R., Gesch, D.B., Gill, S.K., Gutierrez, B.T., Thieler, E.R., Williams, S.J. (Lead Authors). U.S. Environmental Protection Agency, Washington, DC, USA.
- CCSP (2008). *Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Julius, S.H., J.M. West (eds.), J.S. Baron, B. Griffith, L.A. Joyce, P. Kareiva, B.D. Keller, M.A. Palmer, C.H. Peterson, and J.M. Scott (authors). U.S. Environmental Protection Agency, Washington, DC, USA.

Optional Course Texts and Materials

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1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Environmental awareness
3		Environmental ethics
4		Biodiversity and climate change
5		Climate change adaptation
6		Urbanization's role in climate change
7		Water resources and climate change Social learning processes (FORUM 1)
8		Water resources and climate change Social learning processes (FORUM 2)
9		Water resources and climate change Social learning processes (FORUM 3)
10-15		Water management and recycling (concepts, feasibility and consequences, techniques, national and international models)

Course Modules

Course	Environmental Sciences
Module 1	Environment: Ethics and Awareness
Key Concepts	Environmental awareness, Environmental ethics
Overview	Environmental awareness is to understand the fragility of our environment and the importance of its protection. Promoting environmental awareness is an easy way to become an environmental steward and participate in creating a brighter future for our children. To define environmental awareness we must first understand the environmentalist movement. Environmentalism is an ideology that evokes the necessity and responsibility of humans to respect, protect, and preserve the natural world from its anthropogenic (caused by humans) afflictions. Environmental awareness is an integral part of the movement's success. By teaching our students, friends and family that the physical environment is fragile and indispensable. Students need to start fixing the problems that threaten it. Environmental ethics, on the other hand, is the part of environmental philosophy which considers extending the traditional boundaries of ethics from solely including humans to including the non-human world. It exerts influence on a large range of disciplines including environmental law, environmental sociology, ecotheology, ecological economics, ecology and geography. There are many ethical decisions that human beings make with respect to the environment. Throughout this module, students are invited to share and exchange ideas about issues related to : clear cut forests for the sake of human consumption, propagation of species, gasoline powered vehicles, etc.
Aim	The overriding aim of this module is to turn students able to discourse how human actions are contributing to global environmental change.
Learning Outcomes	At the end of this module learners will be able to: • Collect, interpret and present information about strategies to confront

	climate change to a variety of audiences, including other students, parents and the local community. • understand how human actions are contributing to global environmental change.
Units	Unit 1.1: Environmental awareness Unit 1.2: Environmental ethics
Readings	• Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness&id=7141986** • **Paul Pojman** Environmental Ethics: Readings in Theory and Application Paperback – January 1, 2007 • Oxford Dictionary of Philosophy: environmental ethics, **http://www.answers**. com/topic/environmental-ethics
Activity	**Overview** Assignment 1.1: Reflecting Upon the following issues: • clear cut forests for the sake of human consumption. • propagating our species, and life itself. • make gasoline powered vehicles. • environmental obligations needed to keep for future generations. • the extinction of a species for the convenience of humanity. • Methods for best use and conserve of the space environment to secure and expand life.
Module 2	Biodiversity and Climate Change
Key Concepts	Biodiversity, Climate, Climate Change
Overview	In the atmosphere, gases such as water vapour, carbon dioxide, ozone, and methane act like the glass roof of a greenhouse by trapping heat and warming the planet. These gases are called greenhouse gases. The natural levels of these

	gases are being supplemented by emissions resulting from human activities, such as the burning of fossil fuels, farming activities and land-use changes. As a result, the Earth's surface and lower atmosphere are warming, and this rise in temperature is accompanied by many other changes. Rising levels of greenhouse gases are already changing the climate. These changes are affecting the entire world, from low-lying islands in the tropics to the vast polar regions. Also, Climate change affects biodiversity. It becomes one of the most significant drivers of biodiversity loss by the end of the century. It is already forcing biodiversity to adapt either through shifting habitat, changing life cycles, or the development of new physical traits. In this module, students need to realize that, conserving natural terrestrial, freshwater and marine ecosystems and restoring degraded ecosystems (including their genetic and species diversity) is essential for human well-being. Biodiversity can support efforts to reduce the negative effects of climate change. Conserved or restored habitats can remove carbon dioxide from the atmosphere, thus helping to address climate change by storing carbon (for example,reducing emissions from deforestation and forest degradation). Moreover, conserving in-tact ecosystems, such as mangroves, for example, can help reduce the disastrous impacts of climate change such as flooding and storm surges.
Aim	The overriding aim of this module is to realize the interrelationship between biodiversity and climate change
Learning Outcomes	Students will be able to: • Analyse methods of ensuring local participation in climate change adaptation. • Analyze the effects of climate change from both male and female perspectives
Units	Unit 2.1: Biodiversity, Climate, Unit 2.2: Climate Change

	Unit 2.3: Climate Change Adaptation
Readings	Shah, Anup. "Biodiversity." *Global Issues*. 19 Jan. 2014. Web. 10 Sep. 2014. <http://www.globalissues.org/issue/169/biodiversity>. • Doucet, C. (2007) *Urban Meltdown: Cities, Climate Change and Politics as Usual*, New Society Publishers, Gabriola Island BC. • Dow, K. and Downing, T. (2006) *The Atlas of Climate Change: Mapping the World's Greatest Challenge*, University of California Press, Berkeley. • Flannery, T. (2005) *The Weather Makers: How Man is Changing the Climate and What It Means for Life on Earth*, Atlantic Monthly Press NY. • Hansen, J. (2010) *Storms of My Grandchildren: The Truth about the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, Bloomsbury, New York. • Henson, R. (2008) *The Gough Guide to Climate Change: The Symptoms, The Science, The Solutions*, Rough Guides, London.
Activity	**Overview**
	Work in group to: - Collect information on biodiversity in your local environment. - Collect evidence on the effects of climate change on biodiversity in your local environment during the last fifty years. - Propose a strategy to protect biodiversity in your local environment.
Module 3	**Urbanization and Climate Change**
Key Concepts	Urbanization
Overview	This Module deals with the implications of population growth and urbanization for climate change in terms of the contribution of urban populations (and centres) to human induced climate change. It emphasizes how it is not the growth in (urban or rural) population but the growth in consumption that drives

	the growth in greenhouse gas emissions and that a significant proportion of the world's urban (and rural) population have consumption levels that are so low that they contribute little or nothing to such emissions. In this module students discuss how in the much-needed planning for global emissions reduction, provisions must be made to allow low-income low-consumption households with greenhouse gas emissions below the 'fair-share' level to increase their consumption.
Aim	This module aims at examining the relationship between urbanization and climate change.
Learning Outcomes	At the end of this module learners will be able to: • Describe the relationship between human activities and climate change. • Demonstrate an understanding of the natural carbon cycle.
Units	Unit 3.1: Urbanization *Unit 3.2: Urbanization a Mixed Blessing* Unit 3.3: Urbanization and Climate Change
Readings	• David Satterthwaite The implications of population growth and urbanization for climate change, Paper presented at Expert-Group Meeting on Population Dynamics and Climate Change, UNFPA and IIED In Collaboration with UN-HABITAT and the Population Division, UN/DESA 24 to 25 June 2009 • Holper, P. and Torok, S. (2008) *Climate Change: What You Can do about It at Work, at Home, at School*, Pan Macmillan,Sydney. • Hulme, M. (2009) *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*, Cambridge University Press, Cambridge. • Johansen, B. (2006) *Global Warming in the Twenty-First Century*, Praeger Publishers, Westport CT.

	• Moser, S. and Dilling, L. (eds) (2007) *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*, Cambridge University Press, Cambridge.
Activity	**Overview**
	Assignment : Prepare a lecture either of following themes 1. Urbanization: cons and pros 2. Urbanization and Carbon Cycle
Module 4	Water Resources and Climate Change
Key Concepts	Water resources management, Social learning processes
Overview	Water resources are important to both society and ecosystems. We depend on a reliable, clean supply of drinking water to sustain our health. We also need water for agriculture, energy production, navigation, recreation, and manufacturing. Many of these uses put pressure on water resources, stresses that are likely to be exacerbated by climate change. In many areas, climate change is likely to increasewater demand while shrinking water supplies. This shifting balance would challenge water managers to simultaneously meet the needs of growing communities, sensitive ecosystems, farmers, ranchers, energy producers, and manufacturers. In this module need to realize that in some areas, water shortages will be less of a problem than increases in runoff, flooding, or sea level rise. These effects can reduce the quality of water and can damage the infrastructure that we use to transport and deliver water.
Aim	The overriding aim of this module is realize the interrelationship between water resources management and climate change
Learning Outcomes	At the end of this module learners will be able to: • Compare and contrast the impacts of major climatic hazards on livelihoods of the community. • Comprehend the significance of the climate change problem locally and

	globally. • Explore solutions to problems that cause climate change.
Units	Unit 4.1: Water Resources and Climate Change Unit 4.2: Climate change Social learning processes
Readings	• CCSP (2008). *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Backlund, P., A. Janetos, D. Schimel, J. Hatfield, K. Boote, P. Fay, L. Hahn, C. Izaurralde, B.A. Kimball, T. Mader, J. Morgan, D. Ort, W. Polley, A. Thomson, D. Wolfe, M. Ryan, S. Archer, R. Birdsey, C. Dahm, L. Heath, J. Hicke, D. Hollinger, T. Huxman, G. Okin, R. Oren, J. Randerson, W. Schlesinger, D. Lettenmaier, D. Major, L. Poff, S. Running, L. Hansen, D. Inouye, B.P. Kelly, L Meyerson, B. Peterson, and R. Shaw. U.S. Environmental Protection Agency, Washington, DC, USA. • Kundzewicz, Z.W., L.J. Mata, N.W. Arnell, P. Döll, P. Kabat, B. Jiménez, K.A. Miller, T. Oki, Z. Sen, and I.A. Shiklomanov (2007). Freshwater resources and their management. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability* . EXIT Disclaimer *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds.)]. Cambridge University Press, Cambridge, United Kingdom. • CCSP (2009). *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Titus, J.G. (Coordinating Lead Author), Anderson, K.E., Cahoon, D.R., Gesch, D.B., Gill, S.K., Gutierrez, B.T., Thieler, E.R., Williams, S.J. (Lead Authors).

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Activity	**Overview**
	• **Assignment**: plan a seminar on major climatic hazards on livelihoods of the community comparing the problems of water shortages and those of water increases
Module 5	**Water Management and Recycling**
Key Concepts	Water management and recycling processes, techniques
Overview	Water cycle is a delicate balance of precipitation, evaporation, and all of the steps in between. Warmer temperatures increase the rate of evaporation of water into the atmosphere, in effect increasing the atmosphere's capacity to "hold" water. Increased evaporation may dry out some areas and fall as excess precipitation on other areas. Changes in the amount of rain falling during storms provide evidence that the water cycle is already changing. Rising temperatures cause snow to begin melting earlier in the year. This alters the timing of stream flow in rivers that have their sources in mountainous areas. As temperatures rise, people and animals need more water to maintain their health and thrive. Many important economic activities, like producing energy at power plants, raising livestock, and growing food crops, also require water. The amount of water available for these activities may be reduced as Earth warms, and if competition for water resources increases.
Aim	The overriding aim of this module is to equip students with the capacity to debate on water management and recycling processes, techniques and feasibility>

Learning Outcomes	At the end of this module learners will be able to: • Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in. • Investigate the causes of climate change. • Propose solutions to climate change issues.
Units	Unit 5.1: Water management (concepts; national and international models) Unit 5.2: Water recycling techniques feasibility and consequences
Readings	• United Nations Development Programme (2007) *Fighting Climate Change: Human Solidarity in a Divided World: Human Development Report 2007-2008*, Palgrave Macmillan, Basingstoke, UK. • *Layperson's Guide to Water Recycling and Reuse*, published in 1992 by the Water Education Foundation, Sacramento, California. • Video, entitled *Water from Water: Recycling*, produced in 1995 by National Water Research Institute, Fountain Valley, California. • Research On Recycled Water is done by EPA through the Office of Research and Development. • Water Recycling and Reuse: The Environmental Benefits http://www.epa.gov/region9/water/recycling/
Activity	**Overview** **Students are to plan and implement three-sessions workshop on the following themes:** • Water management (concepts; national and international models) • Water recycling techniques feasibility and consequences

Geography of Development

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
92. Environmental awareness 93. Weather and climate 94. Climate change and livelihoods 95. Climate change communication 96. Fairness and climate change justice 97. Future climate change scenarios 98. Anticipation and monitoring 99. Climate change policy 100. Climate change adaptation	110. Adaptive learning and self-reflection; 111. Awareness and advocacy raising 112. Carbon literacy for procurement 113. Contextualising 114. Critical, systemic and futures thinking 115. Debating 116. Discourse 117. Futures thinking 118. Global dynamics 119. Integrated assessment 120. Leadership	122. Accountability 123. Confident 124. Decisive 125. Democratic 126. Empathy 127. Environmental justice 128. Gender-sensitive 129. Global mind-set/ consciousness 130. Interdependency 131. Nonviolence & peace 132. Openness to novelty and change	1. Critically assess the role of governments, international agencies, private actors and NGO's with regard to poverty and development. 2. Critically examine the central concepts underlying development theory and relate them to wider issues of how local societies conceive their long-term sustainability and well-being. 3. Identify how debates and concepts in the field of development geography are being translated in development policies and practice. 4. Discuss certain thematic fields within the human geography of developing countries. 5. Explain the major theories of development and underdevelopment.

101. Risk assessment 102. Environmental economics 103. Environmental law 104. Environment and governance 105. Economics and growth 106. Environmental awareness 107. GIS: geographic information systems	121. Local knowledge 122. Mapping gender impacts 123. Motivate and manage change 124. Networked learning 125. Prioritising 126. Problem solving 127. Resolve ethical dilemmas 128. Scenario analysis and planning 129. Team management	133. Optimism 134. Organised 135. Respect and care for the community 136. Respect for diversity 137. Social cohesion 138. Social responsibility 139. Stewardship 140. Tolerance 141. Transparency 142. Virtue	

Course Syllabus

Course Number:

Geography of Development

University of Port Said, Faculty of Arts, Department of Geography,

2013-2014

Instructor Information

Instructor: Dr
Office Location: Faculty of Arts Campus
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Geography of Development**

Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course provides students with an overview of ideas and themes in development with a particular emphasis on what it means to understand it in terms of geography. It seeks to help students understand both the geographical causes and consequences of varying development. Studies compare More Economically Developed Countries (MEDCs) with Less Economically Developed Countries (LEDCs). Within development geography, sustainable development is also studied in an attempt to understand how to meet the needs of the present without compromising the needs of future generations to meet their own needs. In addition, it explores that 'thinking geographically' about development involves understanding how the meaning of places and regions are socially constructed, and how theoretical and conceptual frameworks about development have been debated. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is they are asked to read and summarize articles on geography of development.

Course Learning Objectives

The overarching goals of this course are: a) to provide a critical approach to the thematic fields within the human geography of developing countries– at local, national and international scales; b) raise awareness of the role of the learners to reflect critically the major theories of development and underdevelopment; and c) use traditional and electronic resources as well as social networking technologies as tools to identify geographical causes and consequences of varying development.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

6. Critically assess the role of governments, international agencies, private actors and NGO's with regard to poverty and development.

7. Critically examine the central concepts underlying development theory and relate them to wider issues of how local societies conceive their long-term sustainability and well-being.
8. Identify how debates and concepts in the field of development geography are being translated in development policies and practice.
9. Discuss certain thematic fields within the human geography of developing countries.
10. Explain the major theories of development and underdevelopment.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		The definition of development, the major theories of development and underdevelopment.
3		The evolution of global inequalities
4		The impacts of population growth and migration, the role of agriculture, industry, and transportation in the development
6		Resource availability and use, pollution of air, water, and biosphere, energy problems.
7		Interactions of humans with plant and animal communities

Geography of Climate

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
108. Environmental awareness 109. Climate change communication 110. Fairness and climate change justice 111. Future climate change scenarios 112. Technology and innovation 113. Climate change implications for integrated coastal planning 114. Risk assessment 115. Climate variability 116. Climate change communication 117. Climate change and health 118. Strategic planning and climate change 119. Role of international institutions 120. Climate change: Science, impacts &	130. Adaptive learning and self-reflection; 131. Awareness and advocacy raising 132. Communicating 133. Contextualising 134. Critical, systemic and futures thinking 135. Debating 136. Discourse 137. Futures thinking 138. Integrated assessment 139. Leadership 140. Local knowledge 141. Motivate and manage change 142. Networked learning 143. Prioritising 144. Problem solving 145. Resolve ethical dilemmas 146. Scenario analysis and planning 147. Team management	143. Accountability 144. Confident 145. Decisive 146. Democratic 147. Empathy 148. Environmental justice 149. Openness to novelty and change 150. Optimism 151. Organised 152. Respect and care for the community 153. Respect for diversity 154. Social responsibility 155. Transparency 156. Sense of urgency 157. Human wellbeing 158. Human rights 159. Social responsibility 160. Perspective 161. Co-responsibility	1. Identify the geographic distributions of climate processes such as temperature, precipitation, and weather. 2. Explain the processes that determine global climate patterns. 3. Interpret weather maps and data. 4. Analyze the causes and explain the implications of global warming. 5- Identify the elements of the climate and the factors affecting it. 7- Identify the elements of the climate on the maps using the suitable symbols. 8- Discuss the concepts of atmospheric disturbances, hurricanes, and how they occur and geographically spread.

scenarios 121. Future climate change scenarios		162. Systematic 163. Focussed	

Course Syllabus

Course Number:

Geography of Climate

Port Said University, Faculty of Arts, Department of Geography, Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of Arts
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Geography of Climate**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to provide students with the key concepts about the geography and climate, the important elements of climate and how they are measured and recorded and handled statistically. It also illustrates the importance of the gaseous envelope of the planet and the threats it faces and how protect it. It familiarizes student elements of the climate and the factors affecting it and its geographical distribution and the skillful representation of the elements of the climate on the maps using the suitable symbols. Students are asked to read and summarize articles on elements of the climate. In short, the course provides an appropriate chance for the students to get the minimum knowledge of the climate processes and elements.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of geography of climate ; b) to raise awareness of the learners about elements of the climate and the factors affecting it; c) and help learners use traditional and electronic tools to identify the the elements of the climate on the maps using the suitable symbols.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify the geographic distributions of climate processes such as temperature, precipitation, and weather.
2. Explain the processes that determine global climate patterns.
3. Interpret weather maps and data.
4. Analyze the causes and explain the implications of global warming.
5- Identify the elements of the climate and the factors affecting it.
7- Identify the elements of the climate on the maps using the suitable symbols.
8- Discuss the concepts of atmospheric disturbances, hurricanes, and how they occur and geographically spread.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Introduction of climate science and its relation with the other sciences .
3		The concept of systems and models in weather and climate
4		Elements of climate.
5		*Components and Characteristics* of the Earth's *Atmosphere*
6		Research Design Methods.

Course Syllabus

Course Number:
Human Rights

Port Said University, Faculty of Education, Department of

Instructor Information

Instructor: Dr. Amal Elarabawy Mahdy
Office Location: Faculty of Education, Port Said University - Egypt
Telephone: 01283844779
Office Hours:
E-mail: prof_amal2012@yahoo.com
Website:

Course Identification

Course Number:
Course Name: Human Rights
Course Location: University Campus

Class Times: 24 hours

Prerequisites:

Faculty Web Page:

Course Description/Overview

Though the political thought cared about the Human rights' issue since ever, this care has not reached the nowadays level but recently; only when the Human rights' issue has become an important issue on the international level during the last decade of the twentieth century. The Human rights' issue has been connected to what distinguish man as a man. This can start with ensuring the right of every child in life even before he is born. Then, his rights extend to his care all his life, as he has the right in security, assurance, education, accommodation, health besides his right in political participation and expressing his opinion.

This course is divided into five parts: the first is titled: The Essence of Human Rights. It deals with the concept of human rights, its importance, beginnings, and the human rights and the peoples' rights. The second part is titled: Judiciary and Human Rights. It tackles the role of judiciary in maintaining the human rights, and the types of human rights as well. The third part is: The Procedures of Human Rights. It deals with the procedures of Human Rights on the international, regional and national levels. The fourth is titled: Applications of Human Rights. This one discusses the applications in the fields of medicine, engineering, agriculture and science. The fifth is titled:

The Islamic and International Declarations of Human Rights, a comparison between the Islamic and International Declarations of Human Rights.

Course Learning Objectives

The overarching goals of this course are:

1. Recognizing the concept of Human Rights and its importance
2. Defining the types of Human Rights
3. Recognizing the procedures of Human Rights, their beginnings and sources
4. Applying Human Rights' procedures in various fields
5. Discussing the restrictions on Human Rights
6. Learning about the historical development of Human Rights and Democracy
7. Determining the relation between Democracy and Human Rights

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Recognize the Human Rights and their procedures
2. State the Civil, Political, Economic and Social Rights
3. Demonstrate the beginnings, sources and procedures of Human Rights
4. Explain some models of Human Rights' Applications on different levels
5. Analyze the Human Rights' procedures on the international, regional and national levels
6. Analyze the international charters of Human Rights
7. Differentiate between the Human Rights in both the Islamic and Western Civilizations

Course Resources

1. Fadl-ullah Muhammad Isma'eil: Human Rights between the Western Thought and the Islamic, Bustan Elma'refa, Alexandria, 2006.
2. Lotfy Mahmoud Abd El-Haleem: Human Rights Between the United Nations' Declarion and the Holy Qur'an, Dar Almisbah, Cairo, 1992.
3. Muhammad El-Ghazaly: Human Rights between the Islamic Instructions and the United Nations' Declaration, Dar Elkotob Elhaditha, Cairo, 1965.
4. Muhammad Abd El-Ma'boud Morsy and al.: Human Rights Suez Canal University, (University Requirement).
5. Muhammad Fathy Othman: Human Rights between the Islamic Law and the Western Legal Thought, Dar El-Shorouk, Beirut, 1982.
6. Muhammad No'man, Egypt and the Human Rights between Truth and Slander (A Documentary Study), The General Egyptian Book Association , Cairo, 1993
7. Muhammad Salam Zanaty, Human Rights (Historical Introduction), 1992.

Course Website(s)

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	40%
Exams	40%
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Disability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		Human Rights, Concept and Importance
2		Beginnings and Sources of Human Rights
3		Human Rights and Peoples' Rights
4		The Role of judiciary in Maintaining Human Rights
5		Types of Human Rights and the Restrictions on them
6		Human Rights' Procedures on the International Level

7		Human Rights' Procedures on the Regional Level
8		Human Rights' Procedures on the National Level
9		Human Rights' Applications in the field of Engineering, Medicine, Agriculture and Science
10		The Islamic Declaration of Human Rights
11		The International Declaration of Human Rights
12		A Comparison Between The Islamic and International Declarations of Human Rights

APENDIX II: The CLIMASP Course Modules Template Example

Course	
Module 1	
Key Concepts	The Essence of Human Rights
Overview	This module tackles the essence of Human Rights and its importance in establishing societies, the beginnings of Human Rights and the most important factors which paved the way for the Human Right Movement within the society.
Aim	The main objective is to identify the concept of Human Rights, its beginning, and the factors which affected it.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Clarify the Human Rights concept, and its importance. • Recognize the historical development of the concept. • Be exposed to the beginning and the sources of Human Rights
Units	• Human Rights: Concept and Importance

	• The Beginning and sources of Human Rights • Human Rights and Peoples' Rights
Readings	Muhammad Salam Zanaty, Human Rights (Historical Introducti 1992.
Activity	
	Writing an essay about the essence of Human Rights and its importance in establishing societies.
Module 2	
Key Concepts	Judiciary and Human Rights
Overview	This module deals with the role of justiciary in maintaining the Human Rights as every individual has the rights to have an effective legal tool in the national court specialized in the deeds violating the Human Rights given to individuals by judiciary or constitution.

	People are equal before judiciary, and therefore have equal protection without any discrimination by judiciary.
Aim	The main aim of this module is recognizing the role and importance of judiciary in maintaining Human Rights, and recognizing the rights given to humans.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Recognize the role of judiciary in maintaining Human Rights • Determine types of Human Rights • Discuss the restrictions on Human Rights
Units	1. The Role of judiciary in maintaining Human Rights 2. Human Rights' Types and Restrictions on them
Readings	Lotfy Mahmoud Abd El-Haleem: Human Rights Between the United Nations' Declarion and the Holy Qur'an, Dar Almisbah, Cairo, 1992
Activity	
	Preparing critical researches on some thoughts presented in the content
Module 3	
Key Concepts	Human Rights' Procedures
Overview	This module deals with the procedures necessary for applying the Human Rights within the society as these rights are

	integrated and no right overwhelms another. Besides, an individual's rights are not separated from the rights of the society. Therefore, procedures are imposed to apply the Human Rights.
Aim	The main goal of this module is recognizing the procedures necessary for applying the Human Rights whether on the international, regional or national levels.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Recognize the Procedures of Applying the Human Rights • Analyze the Human Rights' Procedures on the international, regional or national levels.
Units	1. Human Rights' Procedures on the international level. 2. Human Rights' Procedures on the regional level. 3. Human Rights' Procedures on the national level.
Readings	Muhammad No'man Galal, Egypt and the Human Rights between Truth and Slander (A Documentary Study), The General Egyptian Book Association , Cairo, 1993
Activity	Using the Internet in holding a research on the Human Rights' Procedures on the International, Regional and National Levels
Module 4	
Key Concepts	Human Rights' Applications

Overview	This module focuses on how to apply the Human Rights in the field of medicine for maintaining the patient's rights on the physician, in medical treatment, and in sickness confidentiality. In the field of Engineering, the application is held by the syndicate commitment to the laborers' rights. In Agriculture, it is guaranteed by the protection of the new plant species, etc. In Science, Human Rights are applied via maintaining copyrights as well as other applications.
Aim	The main goal of this module is recognizing the most important Human Rights' Applications in different fields.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Identify the Human Rights' Applications in different fields. • Suggest procedures to apply the Human Rights' Applications in different fields.
Units	1. Human Rights' Applications in the fields of Medicine and Engineering 2. Human Rights' Applications in the fields of Agriculture and Science
Readings	Muhammad No'man Galal, Egypt and the Human Rights between Truth and Slander (A Documentary Study), The General Egyptian Book Association , Cairo, 1993
Activity	

	Holding civil researches about how to apply Human Rights on different fields
Module 5	
Key Concepts	The Islamic and International Declarations of Human Rights
Overview	
Aim	To recognize human rights in both the Islamic and European Civilizations and to learn about the international charters of human rights
Learning Outcomes	By the end of this module, learners are expected to be able to: • Differentiate between human rights in both the Islamic and European Civilizations • Analyze the international charters of human rights
Units	1. The Islamic Declaration of Human Rights 2. The International Declaration of Human Rights 3. A comparison between the Islamic and International Declarations of Human Rights
Readings	Mohammad No'man Galal, Egypt and Human Rights between Truth and Slander (a documentary study), the Egyptian General Association for Books, Cairo, 1993.
Activity	
	Writing an essay that clarifies the most important principals in the

	Islamic and International Declarations of Human Rights

Hydro geochemistry *and Environment*

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
122. Environmental awareness 123. Climate change communication 124. Fairness and climate change justice 125. Future climate change scenarios 126. Technology and	148. Adaptive learning and self-reflection; 149. Awareness and advocacy raising 150. Communicating 151. Contextualising 152. Critical, systemic and futures thinking 153. Debating	164. Accountability 165. Confident 166. Decisive 167. Democratic 168. Empathy 169. Environmental justice 170. Openness to novelty and change	1. Identify the physical and chemical properties of water. 2. Explain the groundwater origin and genesis, water quality modelling, sources of groundwater pollution,. 3- Discuss weathering and water chemistry. 4- Identify the elements of the climate on the maps using the suitable symbols. 5- Explore the influence of aquifer materials on

innovation 127. Climate change implications for integrated coastal planning 128. Risk assessment 129. Climate variability 130. Climate change communication 131. Climate change and health 132. Strategic planning and climate change 133. Role of international institutions 134. Climate change: Science, impacts & scenarios 135. Future climate change scenarios	154. Discourse 155. Futures thinking 156. Integrated assessment 157. Leadership 158. Local knowledge 159. Motivate and manage change 160. Networked learning 161. Prioritising 162. Problem solving 163. Resolve ethical dilemmas 164. Scenario analysis and planning 165. Team management	171. Optimism 172. Organised 173. Respect and care for the community 174. Respect for diversity 175. Social responsibility 176. Transparency 177. Sense of urgency 178. Human wellbeing 179. Human rights 180. Social responsibility 181. Perspective 182. Co-responsibility 183. Systematic 184. Focussed	groundwater quality.

Course Syllabus

Course Number:

Hydro geochemistry *and Environment*

Port Said University, Faculty of science, Department of Environmental Sciences,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of Arts
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Hydro geochemistry and Environment**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to provide students with the key concepts about physical and chemical properties of water, hydrogeochemical processes, influence of aquifer materials on groundwater quality, representations of results of chemical analyses, groundwater origin and genesis, water quality modelling, sources of groundwater pollution, municipal, agricultural, mining, industrial sources, water treatment, the distribution of biota, nutrients and contaminants in the aquatic environment. Topics will include the hydrologic cycle, the carbonate system and pH control, weathering and water chemistry, redox equilibria, and hydrologic transport.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of hydrogeochemical processes and influence of aquifer materials on groundwater quality; b) to raise awareness of the learners about the need for new sources of water needed for irrigation and drink; c) and help learners to acquire water quality modeling: and d) give the basic understanding of hydrologic cycle, carbonate system, weathering and hydrologic transport

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify the physical and chemical properties of water.
2. Explain the groundwater origin and genesis, water quality modelling, sources of groundwater pollution,.
3- Discuss weathering and water chemistry.
4- Identify the elements of the climate on the maps using the suitable symbols.
5- Explore the influence of aquifer materials on groundwater quality.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Water quality modeling.
3		Groundwater origin and genesis
4		Sources of groundwater pollution.
5		*Components and Characteristics* of the Earth's *Atmosphere*
6		Weathering and water chemistry.

Legislation and the laws of Environmental Management

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
136. Environmental awareness 137. Climate change communication 138. Fairness and climate change justice 139. Technology and innovation 140. Risk assessment 141. Climate change and health 142. Strategic planning and climate change 143. Role of international institutions 144. Future climate change scenarios	166. Adaptive learning and self-reflection; 167. Awareness and advocacy raising 168. Communicating 169. Contextualising 170. Critical, systemic and futures thinking 171. Debating 172. Discourse 173. Futures thinking 174. Integrated assessment 175. Leadership 176. Local knowledge 177. Motivate and manage change 178. Networked learning	185. Accountability 186. Confident 187. Decisive 188. Democratic 189. Empathy 190. Environmental justice 191. Openness to novelty and change 192. Optimism 193. Organised 194. Respect and care for the community 195. Respect for diversity 196. Social responsibility 197. Transparency	Upon successful completion of this course, students will be able to: 1. Identify the issues arising from the impact of industrial and development policies on the natural environment. 2. Explain the limitations of environmental law. 3- Discuss perspectives, actors, institutions, and economic relationships as they relate to global environmental policy. 4- Identify the methods of evaluation in environmental management. 5- Explore the linkages between the global political system and the natural environment.

	179. Prioritising 180. Problem solving 181. Resolve ethical dilemmas 182. Scenario analysis and planning 183. Team management	198. Sense of urgency 199. Human wellbeing 200. Human rights 201. Social responsibility 202. Perspective 203. Co-responsibility 204. Systematic 205. Focussed	

Course Syllabus

Course Number:

Legislation and the Laws of Environmental Management

Port Said University, Faculty of science, Department of Environmental Sciences,
Fall Semester

Instructor Information

Instructor: Dr.

Office Location: Faculty of science

Telephone: Office –

Office Hours:

E-mail:

Website:

Course Identification

Course Number:

Course Name: Legislation and the Laws of Environmental Management

Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to provide students with practical and detailed examination of the enactment, enforcement and limitations of environmental law and policy. The course will 'provide a comprehensive overview of environmental law. It critically explores modes of decision-making in contemporary institutions with special emphasis on methods of evaluation in environmental management. Decision analysis, risk assessment and other techniques of 'scientific' decision/evaluation are studied using both theoretical and case-study approaches. The course focuses on perspectives, actors, institutions, and economic relationships as they relate to global environmental policy.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of environmental law; b) to raise awareness of the learners about the need for new methods of evaluation in environmental management; and c) provide students with a solid understanding of linkages between the global political system and the natural environment

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify the issues arising from the impact of industrial and development policies on the natural environment.
2. Explain the limitations of environmental law.
3- Discuss perspectives, actors, institutions, and economic relationships as they relate to global environmental policy.
4- Identify the methods of evaluation in environmental management..
5- Explore the linkages between the global political system and the natural environment.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Domination of Nature.
3		The ethics of scarcity
4		Animal and environmental rights.
5		social benefit and technological risk, and the debate among deep ecologists
6		Social ecologists and eco-feminists over the care of the earth.

Man and Environment

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
8. Environmental awareness 9. Environmental ethics 10. Biodiversity and climate change 11. Climate change adaptation 12. Urbanization's role in climate change 13. Water resources and climate change Social learning processes 14. Risk assessment 15. Climate change and health 16. Pollution and health 17. Gender and climate change 18. Mitigation of pollution	23. Adaptive learning and self-reflection; 24. Awareness and advocacy raising 25. Carbon literacy for procurement 26. Communicating 27. Contextualising 28. Critical, systemic and futures thinking 29. Debating 30. Discourse 31. Emergency psychology 32. Futures thinking 33. Global dynamics 34. Integrated assessment 35. Leadership 36. Local knowledge 37. Mapping gender impacts 38. Motivate and manage change 39. Networked learning 40. Prioritising 41. Problem solving	23. Accountability 24. Confident 25. Decisive 26. Democratic 27. Empathy 28. Environmental justice 29. Gender-sensitive 30. Global mind-set/ consciousness 31. Interdependency 32. Needs vs. wants 33. Nonviolence & peace 34. Openness to novelty and change 35. Optimism 36. Organised 37. Respect and care for the community 38. Respect for diversity 39. Social cohesion 40. Social responsibility 41. Stewardship 42. Tolerance	14. Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community. 15. Analyse methods of ensuring local participation in climate change adaptation. 16. Analyze the effects of climate change from both male and female perspectives 17. Compare and contrast the impacts of major climatic hazards on human health and the community. 18. Comprehend the significance of the climate change problem locally and globally. 19. Describe the relationship between human activities and climate change. 20. Demonstrate an understanding of the effect of pollution on human health 21. Explore solutions to problems that cause climate change. 22. Identify ways to reduce the school's carbon footprint. 23. Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in. 24. Investigate the mitigation of climate change.

	42. Resolve ethical dilemmas 43. Scenario analysis and planning 44. Team management	43. Transparency 44. Virtue	25. Propose solutions to climate change issues. 26. Understand how human actions are contributing to global environmental change.

Course Syllabus

Course Number:

Man and Environment

University of Port Said, Faculty of medicine , Department of Community medicine

Fall Semester, 2013-2014

Instructor Information

Instructor: Prof. EnasElsheikh

Office Location: Faculty of Medicine

Telephone: Office – +20663428168

Office Hours: Tuesday 14.30- 17.00, Wednsday 14.00 – 16.00

E-mail: eelsheikh47@gmail.com

Website:

Course Identification

Course Number: **Γ1**

Course Name: **Man and Environment**

Course Location: Faculty of medicine

Class Times: Wednesday 8:30pm – 11:30am

Prerequisites:
Faculty Web Page: www.psu.edu.eg

Course Description/Overview

Education can be the catalyst for empowering students to become critical, reflective and active citizens. Physician have the potential to be decision maker and practice in the service of educating patients to be active citizens. The present course is intended to raise the students' environmental awareness. It introduces them to the environmental challenges resulting from climate change. It does so through tackling the following logically sequence issues: 1) Environmental awareness; 2)Environmental ethics; 3) Biodiversity and climate change; 4) Climate change adaptation; 5) Urbanization's role in climate change; 6) Water resources and climate change Social learning processes; and 7) natural sources of pollution and man madepollutions 8) air pollution, noise pollution and human activity 9) effect of pollution on health Issues are, however, deeply covered through active participation of the students. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is, they are asked to read and summarize articles on climate changes. They are invited to discuss scenarios for the management of water resources at local, national and international scales. In short, the course provides an appropriate chance for the students practice their role as future citizens.

Course Learning Objectives

The overarching goals of this course are: a) to provide a critical approach to the negative environmental consequences of climate changes – at local, national and international scales -in the context of education for sustainability; b) raise awareness of the role of the learners to reflect critically on the rights, roles and responsibilities of an active citizen in preparing for the management of critical environmental issues; and c) use traditional and electronic resources as well as social networking technologies as tools tohelp the community, including children, identify risks and develop climate change adaptation strategies. d) to raise the awareness of the learner about the need to examine physical, chemical, biological, political and economic dimension of environment

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

- Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community.
- Discuss the basic terminology and core concepts of environment
- Identify the physical chemical biological political and economic dimension of environment
- Conduct survey of environmental system , human interaction
- Analyse methods of ensuring local participation in climate change adaptation.
- Analyze the effects of climate change from both male and female perspectives
- Compare and contrast the impacts of major climatic hazards on human beings and the community.
- Comprehend the significance of the climate change problem locally and globally.
- Describe the relationship between human activities and climate change.
- Describe the relationship between poverty and unsafe environment
- Demonstrate an understanding of the different types of pollutions and its impact on human health
- Explore solutions and mitigation process to problems that cause climate change.
- Identify ways to reduce the impact of climate changes
- Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in.
- Investigate the causes of climate change and pollution
- Propose solutions to climate change issues.
- Understand how human actions are contributing to global environmental change. Course Resources

Course Website(s)

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class
- Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness &id=7141986**
- **Paul Pojman**Environmental Ethics: Readings in Theory and ApplicationPaperback – January 1, 2007
- Oxford Dictionary of Philosophy: environmental ethics,**http://www.answers**.com/topic/environmental-ethics
- Doucet, C. (2007) *Urban Meltdown: Cities, Climate Change and Politics as Usual*, New Society Publishers, Gabriola Island BC.
- Dow, K. and Downing, T. (2006) *The Atlas of Climate Change: Mapping the World's Greatest Challenge*, University of California Press, Berkeley.
- Hansen, J. (2010) *Storms of My Grandchildren: The Truth about the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, Bloomsbury, New York.
- Henson, R. (2008) *The Gough Guide to Climate Change: The Symptoms, The Science, The Solutions*, Rough Guides, London.
- Holper, P. and Torok, S. (2008) *Climate Change: What You Can do about It at Work, at Home, at School*, Pan Macmillan,Sydney.
- Hulme, M. (2009) *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*, Cambridge University Press, Cambridge.
- Johansen, B. (2006) *Global Warming in the Twenty-First Century*, Praeger Publishers, Westport CT.
- CCSP (2008). *Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Julius, S.H., J.M. West (eds.), J.S. Baron, B. Griffith, L.A. Joyce, P. Kareiva, B.D. Keller, M.A. Palmer, C.H. Peterson, and J.M. Scott (authors). U.S. Environmental Protection Agency, Washington, DC, USA.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

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Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Environmental awareness
3		Environmental ethics
4		Biodiversity and climate change /health
5		Climate change adaptation / health
6		Urbanization's role in climate change /health
7		Water resources and climate change Social learning processes (FORUM 1)
8		Air pollution and climate change Social learning processes (FORUM 2)
9		Gender and climate change Social learning processes (FORUM 3)
10-15		Mitigation and health (concepts, feasibility and consequences, techniques, national and international models)

Course Modules

Course	Man and Environment
Module 1	Environment: Ethics and Awareness
Key Concepts	Environmental awareness, Environmental ethics
Overview	Environmental awareness is to understand the fragility of our environment and the importance of its protection. Promoting environmental awareness is an easy way to become an environmental steward and participate in creating a brighter future for our children.To define environmental awareness we must first understand the environmentalist movement. Environmentalism is an ideology that evokes the necessity and responsibility of humans to respect, protect, and preserve the natural world from its anthropogenic (caused by humans) afflictions. Environmental awareness is an integral part of the movement's success. By teaching our students, friends and family that the physical environment is fragile and indispensable. Students need to start fixing the problems that threaten it. Environmental ethics, on the other hand, is the part of environmental philosophy which considers extending the traditional boundaries of ethics from solely including humans to including the non-human world. It exerts influence on a large range of disciplines including environmental law, environmental sociology, ecotheology, ecological economics, ecology and geography. There are many ethical decisions that human beings make with respect to the environment. Throughout this module, students are invited to share and exchange ideas about issues related to :clear cut forests for the sake of human consumption, propagation of species, gasoline powered vehicles, etc.
Aim	The overriding aim of this module is to turn students able to discourse how human actions are contributing to global environmental change.
Learning	At the end of this module learners will be able to:

Outcomes	• Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community. • understand how human actions are contributing to global environmental change.
Units	Unit 1.1:Environmental awareness Unit 1.2: Environmental ethics
Readings	• Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness&id=7141986** • **Paul Pojman**Environmental Ethics: Readings in Theory and ApplicationPaperback – January 1, 2007 • Oxford Dictionary of Philosophy: environmental ethics, **http://www.answers**.com/topic/environmental-ethics
Activity	**Overview** Assignment 1.1: Reflecting Upon the following issues: • clear cut forests for the sake of human consumption. • propagating our species, and life itself. • make gasoline powered vehicles. • environmental obligations needed to keep for future generations. • the extinction of a species for the convenience of humanity. • Methods for best use and conserve of the space environment to secure and expand life.
Module 2	Biodiversity and Climate Change
Key Concepts	Biodiversity, Climate, Climate Change
Overview	In the atmosphere, gases such as water vapour, carbon dioxide, ozone, and methane act like the glass roof of a greenhouse by trapping heat and warming

	the planet. These gases are called greenhouse gases. The natural levels of these gases are being supplemented by emissions resulting from human activities, such as the burning of fossil fuels, farming activities and land-use changes. As a result, the Earth's surface and lower atmosphere are warming, and this rise in temperature is accompanied by many other changes. Rising levels of greenhouse gases are already changing the climate. These changes are affecting the entire world, from low-lying islands in the tropics to the vast polar regions. Also, Climate change affects biodiversity. It becomes one of the most significant drivers of biodiversity loss by the end of the century. It is already forcing biodiversity to adapt either through shifting habitat, changing life cycles, or the development of new physical traits. In this module, students need to realize that, conserving natural terrestrial, freshwater and marine ecosystems and restoring degraded ecosystems (including their genetic and species diversity) is essential for human well-being. Biodiversity can support efforts to reduce the negative effects of climate change. Conserved or restored habitats can remove carbon dioxide from the atmosphere, thus helping to address climate change by storing carbon (for example,reducing emissions from deforestation and forest degradation). Moreover, conserving in-tact ecosystems, such as mangroves, for example, can help reduce the disastrous impacts of climate change such as flooding and storm surges.
Aim	The overriding aim of this module is to realize the interrelationship between biodiversity and climate change
Learning Outcomes	Students will be able to: • Analyse methods of ensuring local participation in climate change adaptation. • Analyze the effects of climate change from both male and female perspectives
Units	Unit 2.1: Biodiversity, Climate,

	Unit 2.2: Climate Change Unit 2.3: Climate Change Adaptation
Readings	Shah, Anup. "Biodiversity." *Global Issues*. 19 Jan. 2014. Web. 10 Sep. 2014. <http://www.globalissues.org/issue/169/biodiversity>. • Doucet, C. (2007) *Urban Meltdown: Cities, Climate Change and Politics as Usual*, New Society Publishers, Gabriola Island BC. • Dow, K. and Downing, T. (2006) *The Atlas of Climate Change: Mapping the World's Greatest Challenge*, University of California Press, Berkeley. • Flannery, T. (2005) *The Weather Makers: How Man is Changing the Climate and What It Means for Life on Earth*, Atlantic Monthly Press NY. • Hansen, J. (2010) *Storms of My Grandchildren: The Truth about the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, Bloomsbury, New York. • Henson, R. (2008) *The Gough Guide to Climate Change: The Symptoms, The Science, The Solutions*, Rough Guides, London.
Activity	**Overview**
	Work in group to: - Collect information on biodiversity in your local environment. - Collect evidence on the effects of climate changeon biodiversity in your local environment during the last fifty years. - Propose a strategy to protect biodiversity in your local environment.
Module 3	**Urbanization and Climate Change**
KeyConcepts	Urbanization
Overview	This Module deals with the implications of population growth and urbanization for climate change in terms of the contribution of urban populations (and centres) to human induced climate change. It emphasizes how it is not the

	growth in (urban or rural) population but the growth in consumption that drives the growth in greenhouse gas emissions and that a significant proportion of the world's urban (and rural) population have consumption levels that are so low that they contribute little or nothing to such emissions. In this module students discuss how in the much-needed planning for global emissions reduction, provisions must be made to allow low-income low-consumption households with greenhouse gas emissions below the 'fair-share' level to increase their consumption.
Aim	This module aims at examining the relationship between urbanization and climate change.
Learning Outcomes	At the end of this module learners will be able to: • Describe the relationship between human activities and climate change. • Demonstrate an understanding of the natural carbon cycle.
Units	Unit 3.1: Urbanization *Unit 3.2: Urbanization a Mixed Blessing* Unit 3.3: Urbanization and Climate Change
Readings	• David Satterthwaite The implications of population growth and urbanization for climate change, Paper presented at Expert-Group Meeting on Population Dynamics and Climate Change, UNFPA and IIED In Collaboration with UN-HABITAT and the Population Division, UN/DESA 24 to 25 June 2009 • Holper, P. and Torok, S. (2008) *Climate Change: What You Can do about It at Work, at Home, at School*, Pan Macmillan,Sydney. • Hulme, M. (2009) *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*, Cambridge University Press, Cambridge. • Johansen, B. (2006) *Global Warming in the Twenty-First Century*, Praeger

	Publishers, Westport CT. • Moser, S. and Dilling, L. (eds) (2007) *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*, Cambridge University Press, Cambridge.
Activity	**Overview**
	Assignment : Prepare a lecture either of following themes 3. Urbanization: cons and pros 4. Urbanization and Carbon Cycle
Module 4	Water Resources and Climate Change
Key Concepts	Water resources management, Social learning processes
Overview	Water resources are important to both society and ecosystems. We depend on a reliable, clean supply of drinking water to sustain our health. We also need water for agriculture, energy production, navigation, recreation, and manufacturing. Many of these uses put pressure on water resources, stresses that are likely to be exacerbated by climate change. In many areas, climate change is likely to increasewater demand while shrinking water supplies. This shifting balance would challenge water managers to simultaneously meet the needs of growing communities, sensitive ecosystems, farmers, ranchers, energy producers, and manufacturers. In this module need to realize that in some areas, water shortages will be less of a problem than increases in runoff, flooding, or sea level rise. These effects can reduce the quality of water and can damage the infrastructure that we use to transport and deliver water.
Aim	The overriding aim of this module is realize the interrelationship between water resources management and climate change
Learning Outcomes	At the end of this module learners will be able to: • Compare and contrast the impacts of major climatic hazards on livelihoods

	of the community. • Comprehend the significance of the climate change problem locally and globally. • Explore solutions to problems that cause climate change.
Units	Unit 4.1: Water Resources and Climate Change Unit 4.2: Climate change Social learning processes
Readings	• CCSP (2008). *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States*. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Backlund, P., A. Janetos, D. Schimel, J. Hatfield, K. Boote, P. Fay, L. Hahn, C. Izaurralde, B.A. Kimball, T. Mader, J. Morgan, D. Ort, W. Polley, A. Thomson, D. Wolfe, M. Ryan, S. Archer, R. Birdsey, C. Dahm, L. Heath, J. Hicke, D. Hollinger, T. Huxman, G. Okin, R. Oren, J. Randerson, W. Schlesinger, D. Lettenmaier, D. Major, L. Poff, S. Running, L. Hansen, D. Inouye, B.P. Kelly, L Meyerson, B. Peterson, and R. Shaw. U.S. Environmental Protection Agency, Washington, DC, USA. • Kundzewicz, Z.W., L.J. Mata, N.W. Arnell, P. Döll, P. Kabat, B. Jiménez, K.A. Miller, T. Oki, Z. Sen, and I.A. Shiklomanov (2007). Freshwater resources and their management. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability*. EXIT Disclaimer *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds.)]. Cambridge University Press, Cambridge, United Kingdom. • CCSP (2009). *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region*. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Titus, J.G.

	(Coordinating Lead Author), Anderson, K.E., Cahoon, D.R., Gesch, D.B., Gill, S.K., Gutierrez, B.T., Thieler, E.R., Williams, S.J. (Lead Authors). U.S. Environmental Protection Agency, Washington, DC, USA. • CCSP (2008). *Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Julius, S.H., J.M. West (eds.), J.S. Baron, B. Griffith, L.A. Joyce, P. Kareiva, B.D. Keller, M.A. Palmer, C.H. Peterson, and J.M. Scott (authors). U.S. Environmental Protection Agency, Washington, DC, USA.
Activity	**Overview**
	• **Assignment**:plan a seminar on major climatic hazards on livelihoods of the community comparingthe problems of water shortages and those of water increases
Module 5	**Water Management and Recycling**
Key Concepts	Water management and recyclingprocesses, techniques
Overview	Water cycle is a delicate balance of precipitation, evaporation, and all of the steps in between. Warmer temperatures increase the rate of evaporation of water into the atmosphere, in effect increasing the atmosphere's capacity to "hold" water.Increased evaporation may dry out some areas and fall as excess precipitation on other areas.Changes in the amount of rain falling during storms provide evidence that the water cycle is already changing. Rising temperatures cause snow to begin melting earlier in the year. This alters the timing of streamflow in rivers that have their sources in mountainous areas. As temperatures rise, people and animals need more water to maintain their health and thrive. Many important economic activities, like producing energy at power plants, raising livestock, and growing food crops, also require water. The amount of water available for these activities may be reduced as Earth warms, and if competition for water resources increases.
Aim	The overriding aim of this module is to equip students with the capacity to

	debate on water management and recycling processes, techniques and feasibility>
Learning Outcomes	At the end of this module learners will be able to: • Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in. • Investigate the causes of climate change. • Propose solutions to climate change issues.
Units	Unit 5.1: Water management (concepts; national and international models) Unit 5.2: Water recycling techniques feasibility and consequences
Readings	• United Nations Development Programme (2007) *Fighting Climate Change: Human Solidarity in a Divided World: Human Development Report 2007-2008*, Palgrave Macmillan, Basingstoke, UK. • *Layperson's Guide to Water Recycling and Reuse*, published in 1992 by the Water Education Foundation, Sacramento, California. • Video, entitled *Water from Water: Recycling*, produced in 1995 by National Water Research Institute, Fountain Valley, California. • Research On Recycled Water is done by EPA through the Office of Research and Development. • Water Recycling and Reuse: The Environmental Benefits http://www.epa.gov/region9/water/recycling/
Activity	**Overview**
	Students are to plan and implement three-sessions workshop on the following themes: • Water management (concepts; national and international models) • Water recycling techniques feasibility and consequences

MAPPING COURSES RELATED TO CLIMATE CHANGE EDUCATION AND SUSTAINABLE DEVELOPMENT				
	COURSE NAME	FACULTY	NAME OF INSTRUCTOR	SHORT DESCRIPTION OF THE COURSE
1	Fish adaptation and climatic change	Fish and fisheries technology	Dr Ahmed Otify	Scientific bases of climate change and the greenhouse effect on earth and Fisheries. Greenhouse gases and carbon dioxide emissions. The land as a container for the storage of carbon emissions and ways to monitor the degradation of land and water resources as a result of climate change. The role of farming plants in reducing the impact of carbon dioxide and the use of computer models in the management of climate change.
2	Paleoecology Course	Science	Prof Abdel- ziz Tantawy	Overview of environmental changes through time, local environmental changes and regional to global climate change of the past, synecology of fossils, paleobiodiversity, changes in communities over geologic time, stable isotopes of oxygen and carbon, paleotemperature. Objectives - to learn and apply methods for determining how environments and climate on Earth have changed through time.

				Learning Outcomes - an understanding of how paleoenvironments and paleoclimate change are studied in the field and lab, and major changes that have occurred.
3	Economic Geology	Science	Dr. Ashraf Emam	This course is an introduction to the geologic and economic factors that result in the development of commercial concentrations of non-energy mineral resources. Course content varies depending on the interests and backgrounds of the students each semester (course may be repeated for credit). Emphasis will be placed on the descriptive geology and origin of economic mineral concentrations within the context of their overall geologic settings. The geologic and economic nature of metallic and industrial mineral commodities in both "hard rock" and "soft rock" geologic environments will be discussed. Related topics to be discussed include importance of mineral resources to the global economy, mineral exploration and evaluation, and mineral extraction and processing
4	Flora	Science	Prof Mohamed sheded	Plants are grouped into floras based on region, period, special environment, or climate. Regions can be geographically distinct habitats like mountain vs. flatland. Floras can mean plant life of a historic era as in fossil flora. Lastly, floras may be subdivided by special environments. The course study plant life occurring in a particular region or time, generally the naturally occurring

				or indigenous—native plant life.
5	Plant community	Science	Prof Mohamed sheded	Study the plant distribution and taxonomy in different regions in Egypt with relation to soil and climatic factors which effect of the distribution of these species.
6	Plant Ecology	Science	Dr Usama Mahalel	Climatic factors affecting on the plant environment and how it effect on the plant cover. Climatic factors effect on soil type and soil formation. The negative and passive relationships among the biotic components of the environment.
7	Ecology of Algae	Science	Dr Ahmed El-Otify	Environment of algae and effects of climatic factors such as light temperature on life cycle of algae and its biomass. Phytoplankton blooming in relation with climatic change.
8	Environmental Geology	Science	Dr. Ashraf Emam	Environmental geology is a science which objectively studies geologic information and applies it to contemporary environmental problems such as pollution, waste management, resource extraction, natural hazards, and human health. An environmental geologist might evaluate the risk and damage potential from natural hazards such as floods, landslides, volcanoes, or earthquakes. The environmental changes on local to global scales can be placed into an earth systems science perspective through examining the evolution and structure of our planet's components, and how these components naturally

				interact. This course is designed to introduce students to the relationship between humans and our Earth. It focuses on environmental and geosciences subjects that facilitate greater awareness of the interactions between the different Earth's components. The course discusses the geologic processes that shape the surface of the Earth, and how these processes affect and are affected by human activity. Moreover, the relationships between the lithosphere, hydrosphere, and atmosphere will be discussed. Particular attentions are given to the subjects of soil, mineralogy, biogeochemical cycles, climate change, and pollution by human activities. The scientific methods that allow studying, prediction, and mitigation of environmental problems will be discussed.
9	Biostatistics	Science	Dr Adel Abdel -Faheem	The course deals with the data come from Biology. The functions of Biostatics are collecting data and organized it, then it can be easily analysis and studying. Making the decisions one strongly depend on the analyses of the data.
10	Engineering and energy history	Engineering	Dr. Mohamed Shaaban	By the end of the course the students will be able to Know: the engineering history in different fields. Know the energy and different sources of it. Know different fields and different programs of engineering Know about the engineer jobs in different pogroms. Understand the engineering

				job ethics
11	Project management	Engineering	Dr. Muntasser Dwidar	By the end of the course the students will be able to: Know The concept and the elements of management: concept of management - Elements of management. - The concept of marketing: define of marketing, The importance of marketing, - The marketing system. Organizing of the marketing functions: Definition of organizing, The organizing of the marketing functions. Consumer behavior: The concept of the consumer behavior, The aspects of the consumer behavior, Studying the markets. The product strategy: The product mix, The product life cycle, New products. The pricing strategy: The importance of pricing, Methods of pricing. Distribution strategy: Distribution channels, Distribution outlets.
12	Thermodynamics fundamentals	Engineering	Dr Waleed Abdel_Fadeel	- By the end of the course the students will be able to: Define the concept of the energy, and different basic concepts like properties, state, process, equilibrium, and cycles. -Identify the different between the ideal gases and the pure substance and understand the property relations relevant to engineering thermodynamics and how to deal with thermodynamic tables. -Identify the concept of energy and mass conservation and apply this concept on different applications
13	Energy conversion and utilization	Engineering	Dr.Ezzat Gad	**By the end of the course the students will be able to:** Demonstrate knowledge and

				understanding of electromechanical energy conversion principles for electromagnetic and electrostatic systems. - Understand the traction systems. - Recognize and analyze illumination and heating systems. - Analyze and understand essential industrial drives aspects. -The student shall attain the above mentioned objectives efficiently under controlled guidance and supervision. -To recognize the concepts and basics of electric power transmission and distribution theory.
14	Heat and mass transfer	Engineering	Dr. Mahmuod Hasan	By the end of the course the students will be able to: - Demonstrate knowledge of heat transfer definitions and terminology, including heat flux, thermal conductivity, and heat transfer coefficients. - Demonstrate knowledge of conduction and the equivalent resistance formula, convective and use of the overall heat transfer coefficient, radiant heat transfer, including black bodies, gray bodies and emissivity. - Demonstrate knowledge of heat exchangers, including the different types and how they operate, application. - Demonstrate knowledge of mass transfer definition and compare it with convenient heat transfer. - Apply this knowledge on various engineering application. - Share ideas and work in a team in an efficient and effective manner under controlled supervision or independently.

15	Renewable energy resources industrial	Engineering	Dr. Salama Abdel-Hady	By the end of the course the students will be able to: Identity different renewable energy, resources for power production such as wind, Solar, and non-conventional by hydro-power. Recognize natural sources of wind and solar ? energies in Egypt. Practice the operation and Design of Horizontal and Vertical Axis wind Turbines. Practice the Operation and Design of Solar flat plate collectors, concentrator systems, photovoltaic systems and other solar applications. Practice the operation of non-conventional hydro Power Systems Such as wave Energy and Tidal Energy. Recognize other renewable energy technologies such as Biomass, Ocean Thermal Energy …etc.
16	Pollution	Engineering	Dr. Mohamed Fathi	By the end of the course the students will be able to know: definition of pollution- Sources of pollution - Types of pollution and their effect on lumen health. Methods of measurement - methods of pollutant reduction.
17	Social Science rural and urban	Social Work	Dr. Mohamed Nagdy	Study the traditionally associated with the study of social structure and conflict rural areas although topical areas such as food and agriculture or natural resource access transcend traditional rural spatial boundaries
18	Introduction to Social Welfare	Social Work	Dr Mohamed Gaber Abbas	Study the social welfare function as t rank social states (alternative complete descriptions of the society) as less desirable, more desirable, or

				indifferent for every possible pair of social states. Inputs of the function include any variables considered to affect the economic welfare of a society. In using welfare measures of persons in the society as inputs, the social welfare function is individualistic in form. One use of a social welfare function is to represent prospective patterns of collective choice as to alternative social states.
19	Community health	Social Work	Dr Modather Seleem	This course is an introduction to the theory and practice of public and community health. The influence of public health professionals on the past, present and future health status of society through the examination of critical health issues will be described. Programming models, theories and policy development are included
20	Introduction to Social planning	Social Work	Dr. Kawther Kenawy	Speaking of this decision for the basis of and methods entrances and planning mechanisms for social programs and social services and is also interested in general political social.
21	Social work in one of the developed fields	Social Work	Dr Ali Dandarawy	This course deals with social service in the field of environment and sustainable development and to support community-based organizations working in the field of environment.
22	Populations and Environmental Studies	Social Work	Dr. Mohamded Abdel-Razik Dr. Mohamed Sayed	This course focuses on both sides, the first dimension of the population is interested in different societies, and the second deals with the concepts of environmental and environmental problems in the community

23	Environmental studies	Education	Dr Saied Sadeek	Knowledge of environmental concepts such as the environment and environmental pollution study the main features of the program to protect the environment. Identify the role of education in the face of environmental problems. Compare between the environment and environmental education.
24	Principles of Psychology	Education	Dr Adel Abaady	Study different types of psychology such as Environmental Psychology and the environmental factors that affect human health.
25	Adult education and environment Work	Education	Dr Abde Hay Mohamed Ali	This course aims to give a general idea about the importance of adult education and literacy as a requirement necessary for the development of society, especially in the current era, which is characterized as the era of knowledge it is true that there will be individuals in the community do not know how to read and write. In addition the environmental problems that affect individuals

Remote sensing and geology pictorial

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
145. Environmental awareness 146. Climate change communication 147. Fairness and climate change justice 148. Technology and innovation 149. Risk assessment 150. Climate variability 151. Strategic planning and climate change 152. Role of international institutions 153. Climate change: Science, impacts & scenarios	184. Adaptive learning and self-reflection; 185. Awareness and advocacy raising 186. Communicating 187. Contextualising 188. Critical, systemic and futures thinking 189. Debating 190. Discourse 191. Futures thinking 192. Integrated assessment 193. Leadership 194. Local knowledge 195. Motivate and manage change 196. Networked learning 197. Prioritising 198. Problem solving 199. Resolve ethical dilemmas 200. Scenario analysis and planning 201. Team management	206. Accountability 207. Confident 208. Decisive 209. Democratic 210. Empathy 211. Environmental justice 212. Openness to novelty and change 213. Optimism 214. Organised 215. Respect and care for the community 216. Respect for diversity 217. Social responsibility 218. Transparency 219. Sense of urgency 220. Human wellbeing 221. Human rights 222. Social responsibility 223. Perspective 224. Co-responsibility	1. Identify the types of remote sensing. 2. Explain the principles and process of remote sensing. 3- Discuss the different remote sensing systems. 4- Differentiate between the active and passive sensors. 5- Explore the remote sensing platforms.

		225. Systematic 226. Focussed	

Course Syllabus

Course Number:

Remote sensing and Geology Pictorial

Port Said University, Faculty of science, Department of Environmental Sciences,

Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **remote sensing and geology pictorial**

Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to provide students with the key concepts about the remote sensing, collection of data, sensing devices, evaluation of the collected data, applications of remote sensing techniques in geological purposes, image data processing, image rectification processing, image display and enhancement processing, edge enhancement processing, digital mosaics processing, contrast stretching processing, color composition, principle component analysis (PCA), decorrelation stretch , aerial photography, (elements, airphoto interpretation (instrumentation and procedures), principles of landform identification and evaluation, applications of aerial photographs in geology), earth resources satellites, multispectral scanners, digital image processing, applications of remote sensing and geographic information systems in geology.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of applications of remote sensing techniques in geological purposes; b) to train learners in geographic information systems and remote sensing as applied to geological exploration c) and help learners to

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify the types of remote sensing.
2. Explain the principles and process of remote sensing.
3- Discuss the different remote sensing systems.
4- Differentiate between the active and passive sensors.
5- Explore the remote sensing platforms.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Concept of remote sensing.
3		Sensor on the ground, in the air and in the space
4		Elements of climate.
5		Types of remote sensing
6		Applications of remote sensing techniques in geological purposes.

Renewable Energy

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
154. Environmental awareness 155. Renewable energy technologies 156. Energy efficiency behaviour 157. Technology and innovation 158. Climate change policy 159. Climate change adaptation 160. Sustainable consumption and production 161. Sustainable communities 162. Sustainable construction 163. Environmental awareness 164. Climate change: Science, impacts & scenarios 165. Sustainable	202. Dealing with uncertainty 203. Adaptive learning and self-reflection; 204. Awareness and advocacy raising 205. Communicating 206. Contextualising 207. Critical, systemic and futures thinking 208. Debating 209. Discourse 210. Futures thinking 211. Integrated assessment 212. Leadership 213. Local knowledge 214. Mapping gender impacts 215. Motivate and manage change 216. Networked learning 217. Prioritising 218. Problem solving	227. Accountability 228. Confident 229. Decisive 230. Democratic 231. Empathy 232. Environmental justice 233. Openness to novelty and change 234. Optimism 235. Organised 236. Respect and care for the community 237. Respect for diversity 238. Social responsibility 239. Sense of urgency 240. Human wellbeing 241. Human rights 242. Solidarity 243. Perspective 244. Co-responsibility	15. Explain the impacts of traditional energy resources on environment. 16. Compare and contrast the advantages and disadvantages of renewable energy resources with the advantages and disadvantages of traditional energy resources. 17. Identify the basic principles of renewable energy technologies. 18. Question the relation between sustainable development and the use of renewable energy resources. 19. Discuss the different types of renewable energy resources. 20. Anticipate possible future environmental change and identify possible development consequences. 21. Appreciate the positive impacts of utilizing renewable energy resources on the environment. 22. Explain the relationship between poverty, environment, climate change, and the insufficient supply of energy.

development and resilience 166. Future climate change scenarios	219. Resolve ethical dilemmas 220. Scenario analysis and planning 221. Team management	245. Systematic 246. Focussed	23. Use the different tools and equipments of renewable energy resources.

Course Syllabus

Course Number:

Renewable Energy

Port Said University, Faculty of Science, Department of Physics,
Fall Semester

Instructor Information

Instructor:
Office Location: Faculty of Science Campus
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **renewable energy**
Course Location: University Campus
Class Times:
Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to raise the students' awareness of renewable energy resources. It introduces them to the benefits of using clean energy resources. It does so through tackling the following aspects: 1) traditional and renewable energy resources; 2) impact of energy consumption on environment; 3); clean energy resources and climate change; 4) availability of solar and wind energy in Egypt; and 5) energy and future global climate change. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is they are asked to read and summarize articles on renewable energy resources. They are invited to discuss impacts of energy resources on environment at local, national and international scales. In short, the course provides an appropriate chance for the students to get the minimum knowledge of the advantages and disadvantages of renewable energy resources.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of the renewable energy resources; b) to raise the learners' awareness of the need to explore renewable energy resources in order to achieve the goals of community development; c) help learners use traditional and electronic tools to identify the risks of the petroleum and natural gas limitations in Egypt; and d) to highlight the importance of renewable energy resources as clean and safe resources to the environment.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

24. Explain the impacts of traditional energy resources on environment.
25. Compare and contrast the advantages and disadvantages of renewable energy resources with the advantages and disadvantages of traditional energy resources.
26. Identify the basic principles of renewable energy technologies.
27. Question the relation between sustainable development and the use of renewable energy resources.
28. Discuss the different types of renewable energy resources.

29. Anticipate possible future environmental change and identify possible development consequences.
30. Appreciate the positive impacts of utilizing renewable energy resources on the environment.
31. Explain the relationship between poverty, environment, climate change, and the insufficient supply of energy.
32. Use the different tools and equipments of renewable energy resources .

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Energy Resources and Supply.
3		Renewable energies and clean technologies.
4		Solar Energy, solar cells, solar thermal heating systems, and electricity generation.
5		Tidal and Hydro as renewable energy resources.
6		Renewable Energy Integration and Energy Efficiency in the Built Environment
7		Research Design Methods.

Scientific Culture

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
167. Environmental awareness 168. Weather and climate 169. Climate change and livelihoods 170. Gender-sensitive response to climate change 171. Climate change communication 172. Fairness and climate change justice 173. Future climate change scenarios	222. Adaptive learning and self-reflection; 223. Awareness and advocacy raising 224. Carbon literacy for procurement 225. Communicating 226. Contextualising 227. Critical, systemic and futures thinking 228. Debating 229. Discourse 230. Emergency psychology 231. Futures thinking 232. Global dynamics 233. Integrated assessment 234. Leadership 235. Local knowledge 236. Mapping gender impacts 237. Motivate and manage change	247. Accountability 248. Confident 249. Decisive 250. Democratic 251. Empathy 252. Environmental justice 253. Gender-sensitive 254. Global mind-set/ consciousness 255. Interdependency 256. Needs vs. wants 257. Nonviolence & peace 258. Openness to novelty and change 259. Optimism 260. Organised 261. Respect and care for the community 262. Respect for diversity	1. Become familiar with the basic terminology and core concepts of climate change adaptation planning. 2. Identify the most likely impacts of local climatic hazards. 3. Articulating what good climate resilient development actually look like. 4. Compare local problems with problems elsewhere and to gain adaptation ideas from this comparison. 5. Comprehend the opportunities for planners and the social, economic and ecological risks of climate change. 6. Understand historical community reactions to and coping strategies for climatic hazards. 7. Contribute to the debate on global environmental change and societal adaptation strategies; to become an informed citizen and decision maker. 8. Demonstrate capacities for self-reflection and self-evaluation as integral aspects of the adaptive learning cycle.

	238. Networked learning 239. Prioritising 240. Problem solving 241. Resolve ethical dilemmas 242. Scenario analysis and planning 243. Team management	263. Social cohesion 264. Social responsibility 265. Stewardship 266. Tolerance 267. Transparency 268. Virtue	9. Questioning business as usual can threaten our ideals, values, beliefs, business strategies and technical understanding and is not necessarily what everyone wants to hear. 10. Draw on active teaching and learning approaches to empower learner, young people and civic engagement. 11. Anticipate possible future environmental change and identify possible development consequences. 12. Appreciate the importance and practical characteristics of adaptive approaches. 13. Demonstrate knowledge and understanding of relationship between poverty, environment, climate change, economics and social issues. 14. Relate climate change and sustainability policy to a range of curricular areas in formal, non formal and informal education.

Course Syllabus

Course Number:

Scientific Culture

University of Port Said, Faculty of Education, Department of Curricula and Methods of Teaching,

Fall Semester, 2013-2014

Instructor Information

Instructor: Dr, Mahmoud Mohammed Mohasseb

Office Location: Faculty of Education Campus

Telephone: Office –

Office Hours: Tuesday 14.30- 17.00, Wednsday 14.00 – 16.00

E-mail:

Website:

Course Identification

Course Number: **Γ0**

Course Name: **Scientific Culture**

Course Location: University Campus

Class Times: Wednesday 8:30pm – 11:30am

Prerequisites:

Faculty Web Page:

Course Description/Overview

Education can be the catalyst for empowering students to become critical, reflective and active citizens. Teachers have the potential to be what Giroux and McLaren described as transformative intellectuals who combine scholarly reflection and practice in the service of educating students to be thoughtful, active citizens. The present course is intended to raise the students' environmental awareness. It introduces them to the challenges resulting from climate change. . It does so through tackling the following logically sequenced six issues: 1) Weather and climate; 2) Climate change and livelihoods; 3) Gender-sensitive response to climate change; 4) Climate change communication; 5) Fairness and climate change justice; and 6) Future climate change scenarios. Issues 3-6 are, however, deeply covered through active participation of the students. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is they are asked to read and summarize articles on climate changes. They are invited to discuss scenarios for the management of climate changes at local, national and international scales. In short, the course provides an appropriate chance for the students practice their role as future citizens.

Course Learning Objectives

The overarching goals of this course are: a) to provide a critical approach to the consequences of climate changes – at local, national and international scales - in the context of education for sustainability; b) raise awareness of the role of the learners to reflect critically on the rights, roles and responsibilities of an active citizen in preparing for a sustainable future for all; and c) use traditional and electronic resources as well as social networking technologies as tools to help the community, including children, identify risks and develop climate change adaptation strategies.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

32. Become familiar with the basic terminology and core concepts of climate change adaptation planning.
33. Identify the most likely impacts of local climatic hazards.
34. Articulating what good climate resilient development actually look like.
35. Compare local problems with problems elsewhere and to gain adaptation ideas from this comparison.

36. Comprehend the opportunities for planners and the social, economic and ecological risks of climate change.
37. Understand historical community reactions to and coping strategies for climatic hazards.
38. Contribute to the debate on global environmental change and societal adaptation strategies; to become an informed citizen and decision maker.
39. Demonstrate capacities for self-reflection and self-evaluation as integral aspects of the adaptive learning cycle.
40. Questioning business as usual can threaten our ideals, values, beliefs, business strategies and technical understanding and is not necessarily what everyone wants to hear.
41. Draw on active teaching and learning approaches to empower learner, young people and civic engagement.
42. Anticipate possible future environmental change and identify possible development consequences.
43. Appreciate the importance and practical characteristics of adaptive approaches.
44. Demonstrate knowledge and understanding of relationship between poverty, environment, climate change, economics and social issues.
45. Relate climate change and sustainability policy to a range of curricular areas in formal, non formal and informal education.

- **Course Resources**

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

- Gender and Climate Change Adaptation: Tools for Community-level Action in Nigeria, http://africanclimate.net/en/node/8979
- Climate Change: Key Concepts. **http://www.careclimatechange.org/tk/cba/en/cba_** basics/key_concepts.html
- The Intergovernmental Panel on Climate Change (IPCC) is a body set up to provide scientific, technical and socio-economic information in a policy-relevant but policy neutral way to decision makers.
- IPCC, 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.
- Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.*
- Task Force on Climate Change, Vulnerable Communities and Adaptation (IUCN, SEI and IISD), 2003. Livelihoods and Climate Change. Combining Disaster Risk Reduction, Natural Resource Management and Climate Change adaptation in a new approach to the reduction of vulnerability and poverty. International Institute for Sustainable Development, Canada.
- World Bank 2009. Convenient Solutions to an Inconvenient Truth: Ecosystem-based Approaches to Climate Change. Environment Department, World Bank.
- Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.*
- Adapted from: UNISDR, 2009. Terminology: Basic terms of disaster risk reduction and IISD et al, 2007. Community-based Risk Screening – Adaptation and Livelihoods (CRiSTAL) User's Manual, Version 3.0.
- UNISDR, 2009. Terminology: Basic terms of disaster risk reduction. Department for International Development, UK (DFID). 2001. *Sustainable Livelihoods Guidance Sheet*. Available at **http://www.nssd.net/pdf/ sectiont.pdf**.
- Scoones, Ian (2005): The Sustainable Rural Livelihoods: A Framework for Analysis. Institute for Development Studies, University of Sussex. England. **http://www.sarpn.org.za/www.careclimatechange.org/files/adaptation/ d0001493/P1833-Sustainable-rural-livelihoods_IDS-paper72.pdf**.
- IPCC, 2007: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.

- NASA - What's the Difference Between Weather and Climate? http://www. nasa.gov/mission_ pages/noaan/climate/climate_weather.html#. VAv8Mfl_vdM February 1, 2005
- Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 http://ezinearticles.com/?How-to-Promote-Environmental-Awareness&id=7141986
- *Livelihoods and Climate Change* ***http://www.iisd.org/ecp/es/resilience/*** *climate.asp*
- Livelihoods and Climate Change Project Snapshot (PDF - 438 kb), http://www.iisd.org/ecp/es/resilience/climate.asp
- Livelihoods and Climate Change: Combining disaster risk reduction, natural resource management and climate change adaptation in a new approach to the reduction of vulnerability and poverty (PDF - 1.6 mb), http://www.iisd.org/ecp/es/resilience/climate.asp
- Steve Vanderheiden Climate Change, Fairness, and Equity in *Atmospheric Justice* Published in print June 2008|ISBN: 9780195334609 Published online May 2008 | e-ISBN: 9780199868759 | DOI: http://dx.doi .org/10.1093/acprof:oso/9780195334609.003.0002 http://oxfordindex.o up.com/ view/10.1093/ acprof:oso/9780195334609. 003.0002
- Carter, T.R. *et al*. (2001). "Developing and Applying Scenarios. In: Climate Change 2001: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change [J.J. McCarthy *et al.* Eds.]". Cambridge University Press, Cambridge, U.K., and New York, N.Y., U.S.A. Retrieved 2010-01-10.
- "Using the Clean Air Act to Sharply Reduce Carbon Pollution from Existing Power Plants". Natural Resources Defense Counsel. Retrieved October 9, 2013.
- Morita *et al.*, "Chapter 2, Greenhouse Gas Emission Mitigation Scenarios and Implications", Sec. 2.5.1.1 IPCC Emissions Scenarios and the SRES Process, in IPCC TAR WG3 2001.
- Karl, TR, *et al*, ed. (2009), "Global climate change", *Global Climate Change Impacts in the United States*, New York, NY, USA: Cambridge University Press, p. 22, ISBN 978-0-521-14407-0
- Rogner, H.-H., *et al.*, "Introduction", Sec 1.3.2 Future outlook, in IPCC AR4 WG3 2007
- Section 4.4.1, Carbon dioxide emissions from energy supply by 2030, in IPCC AR4 WG3 2007

- IPCC AR4 WG3 (2007), Metz, B.; Davidson, O.R.; Bosch, P.R.; Dave, R.; and Meyer, L.A., ed., *Climate Change 2007: Mitigation of Climate Change*, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, ISBN 978-0-521-88011-4(pb: 978-0-521-70598-1).

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave

early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Environmental awareness
3		Weather and climate
4		Climate change and livelihoods
5		Climate change and livelihoods (man, plant, animals)
6		Gender-sensitive response to climate change
7		Male/Female: awareness of climate change consequences
8		Male/Female: roles to alleviate climate change consequences
9		Climate change communication (Concepts)

10		Climate change communication (tools: design)
11		Climate change communication (tools: implementation/analysis)
12		Fairness and climate change justice
13-15		Future climate change scenarios

Course Modules

Course	Scientifc Culture
Module 1	**Climate Change : Environmental Impacts**
Key Concepts	Climate Change, Environment
Overview	The term environment may be vague for many students, Some of them my be concerned with the physical environment around them. They might ignore my cultural components of environment which are responsible for shaping mans attitudes, and in turn, influence our behaviour. Such behaviour might aggregate or alleviate the environmental challenges. Mans behaviour may be affected by climate change. So, his reaction toward the environment is almost disastrous!! Issues addressed in this module include: definition of environment, components of environment: physical and cultural; basic differences between weather and climate; and impacts of local climatic hazards.
Aim	The aim of this module is to turn students able to discourse on basic concepts related to environment and the impact of climate change.
Learning Outcomes	At the end of this module learners will be able to: 1. Become familiar with the basic terminology and core concepts of climate change adaptation planning. 2. Identify the most likely impacts of local climatic hazards. 3. Articulating what good climate resilient development actually look like.
Units	Unit 1.1: Environment: Physical and Cultural Unit 1.2: Man VS Environment Unit 1.3: Weather and Climate
Readings	• Climate Change: Key Concepts. **http://www.careclimatechange.org/tk/cba/en/cba_**basics/key_concepts.html • The Intergovernmental Panel on Climate Change (IPCC) is a body set up to

provide scientific, technical and socio-economic information in a policy-relevant but policy neutral way to decision makers.

- IPCC, 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.
- Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.*
- NASA - What's the Difference Between Weather and Climate? http://www. nasa.gov/mission_ pages/noaan/climate/climate_weather.html#. VAv8Mfl_vdM February 1, 2005
- Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness&id=7141986**

Activity	**Overview** Assignment 1.1: Reflecting Upon environmental issues 1. To what extent is responsible for environmental problems? (3-4 paragraphs) 2. What can we do to alleviate environmental problems? 3. draw a table of comparison to show the main differences between climate and weather. Assignment 1.2: Investigate local environmental problems to: - Make a list of most serious environmental problems - Interview a sample of citizens to identify their awareness of such problems. Access and explore the following report to identify and summarize its main ideas with regard the management of the environmental impacts of Climate Change: World Bank 2009. Convenient Solutions to an Inconvenient Truth: Ecosystem-based Approaches to Climate Change. Environment Department, World Bank.
Module 2	Climate Change and Livelihoods: Problems and Solutions
Key Concepts	Climate change , livelihoods (man, plant, animals)

Overview	The world is highly susceptible to a number of natural hazards droughts including, floods and hurricanes. Increasing in frequency and ferocity as a result of changing climate systems, these disasters are placing increased stress on inhabitants and severely impairing economic growth as they batter climate vulnerable sectors like tourism and agriculture upon which the region is financially reliant.In order to avoid risks and damage and to strengthen human resilience to natural disasters, governments need to be prepared. However, in developing countries, the ability of governments to help is often very limited. The impacts of loss and damage associated with natural disasters can set back development by increasing the incidence and severity of poverty. Poverty and vulnerability are fundamentally intertwined: the poor have fewer resources to cope with climate risk and thus their resource base is further diminished with every extreme weather event, deepening their poverty. This module is intended to raise the students awareness towards local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas for the management of such problems.
Aim	The overriding aim of this module is to identify local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas from this comparison.
Learning Outcomes	At the end of this module learners will be able to compare local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas from this comparison.
Units	Unit 2.1: Climate change and livelihoods Unit 2.2: Climate change and livelihoods (man, plant, animals)
Readings	• Task Force on Climate Change, Vulnerable Communities and Adaptation (IUCN, SEI and IISD), 2003. Livelihoods and Climate Change. Combining Disaster Risk Reduction, Natural Resource Management and Climate Change adaptation in a new approach to the reduction of vulnerability and poverty. International Institute for Sustainable Development, Canada.

	• Scoones, Ian (2005): The Sustainable Rural Livelihoods: A Framework for Analysis. Institute for Development Studies, University of Sussex. England. **http://www.sarpn.org.za/www.careclimatechange.org/files/adaptation/d0001493/P1833-Sustainable-rural-livelihoods_IDS-paper72.pdf**. • *Livelihoods and Climate Change **http://www.iisd.org/ecp/es/resilience/** climate.asp* • Livelihoods and Climate Change Project Snapshot (PDF - 438 kb), http://www.iisd.org/ecp/es/resilience/climate.asp • Livelihoods and Climate Change: Combining disaster risk reduction, natural resource management and climate change adaptation in a new approach to the reduction of vulnerability and poverty (PDF - 1.6 mb), http://www.iisd.org/ecp/es/resilience/climate.asp
Activity	**Overview**
	Design poster showing local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas for the management of such problems.
Module 3	**Gender-Sensitive Response to Climate Change**
Key Concepts	Gender-Sensitive
Overview	A gender-sensitive response does not mean having a set of disaggregated data showing that climate change has differential impacts on women and men. In fact, it is obvious. So more than that, it requires an understanding of the nature of existing inequalities between women and men, their consequences, and then coming up with strategies to nullify them. However, due to their social status men may have greater access to vital information on climate change mitigation or adaptation strategies, or women are too busy with caring and other domestic responsibilities so they lack this information. Therefore, lack of information and lack of opportunity to voice their concerns about adaptation and mitigation strategies could jeopardize their safety when climate change events strike.

	To counter this situation, strategies need to be planned so that women receive as much information on climatic events and conditions as men do. Women are also more likely than men to be absent from decision-making, right from home, to community, to national, to international levels for two reasons. One, their opinion is not given importance and two, they don't have time or confidence or opportunity to share. Therefore, whatever the reasons are they are simply marginalized; and the same is true for elderly and children. The net result is that they remain more vulnerable than men. Thus, if effective adaptation strategies have to be chalked out for them they must be drawn out to participate in the climate change discussions which in turn, means challenging the traditional assumptions about their capabilities and redefining their gender equation. For centuries, women have passed on their skills in water management, forest management and the management of biodiversity, among others. Through these experiences, women have acquired valuable knowledge that will allow them to contribute positively to the identification of appropriate adaptation and mitigation techniques, if only they are given the opportunity. The present module is concerned with: Male/Female awareness of climate change consequences; as well as their role in the management of climate change consequences.
Aim	This module encourages the students to the debate on global environmental change and societal adaptation
Learning Outcomes	At the end of this module learners will be able to: • Contribute to the debate on global environmental change and societal adaptation strategies; to become an informed citizen and decision maker. • Demonstrate capacities for self-reflection and self-evaluation as integral aspects of the adaptive learning cycle.
Units	Unit 3.1: Gender-sensitive response to climate change

	Unit 3.2: Male/Female: awareness of climate change consequences Unit 3.3: Male/Female: how to alleviate climate change consequences
Readings	• Gender and Climate Change Adaptation: Tools for Community-level Action in Nigeria, http://africanclimate.net/en/node/8979 • Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.* • IPCC, 2007: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.
Activity	**Overview**
	Assignment 1: Propose a strategy to: 1- Raise the awareness of both Male and Female citizen towards the climate change consequences in your local environment 2- how to involve both Male and Female citizen in the management of climate change consequences in your local environment
Module 4	**Climate Change Communication**
Key Concepts	social, economic and ecological risks of climate change; civic engagement

Overview	The rapid development of multimedia and hypermedia technologies has provided new avenues for merging images, sound, movies and animation together with texts. These can serve as effective tools for communicating information and data related to climate change concepts, causes and consequences. Climate change is the result of human actions and choices. Limiting climate change – and protecting people and ecosystems to the degree possible from unavoidable changes in the climate – will require significant public engagement in the issue so that difficult decisions can be made by members of the public and policy makers. So, the need emerges for unbiased social science research that will facilitate such public engagement. In other words, students should be trained on how to use social science research methods – experiments, surveys, in-depth interviews and other methods – to find ways of effectively engaging the public and policy makers in the problem, and in considering and enacting solutions. Social science research has played important roles in many social change campaigns over the past several decades, including reducing smoking and littering, and increasing seat belt use and recycling. So, they can conduct unbiased public engagement research - and help government agencies, non-profit organizations, and companies apply the results of this research - so that collectively, we can stabilize our planet's life sustaining climate.
Aim	The overriding aim of this module is encourage the students explore and use appropriate tools to communicate social, economic and ecological risks of climate change.
Learning Outcomes	At the end of this module learners will be able to: - Comprehend the opportunities for planners and the social, economic and ecological risks of climate change. - Understand historical community reactions to and coping strategies for climatic hazards. - Questioning business as usual can threaten our ideals, values, beliefs,

	business strategies and technical understanding and is not necessarily what everyone wants to hear. - Draw on active teaching and learning approaches to empower learner, young people and civic engagement.
Units	Unit 3.1: Climate Change Communication (Concepts) Unit 3.2: Climate Change Communication (tools: design) Unit 3.3: Climate Change Communication (tools: implementation/analysis)
Readings	• Adapted from: UNISDR, 2009. Terminology: Basic terms of disaster risk reduction and IISD et al, 2007. Community-based Risk Screening – Adaptation and Livelihoods (CRiSTAL) User's Manual, Version 3.0. • UNISDR, 2009. Terminology: Basic terms of disaster risk reduction. Department for International Development, UK (DFID). 2001. *Sustainable Livelihoods Guidance Sheet*. Available at **http://www.nssd.net/pdf/sectiont.pdf**.
Activity	**Overview**
	Assignment: Students are invited to work in groups to: - Design appropriate tools to communicate social, economic and ecological risks of climate change. - Write a report on the obtained results of communicating social, economic and ecological risks of climate change. - Orally present the outcomes of the above report
Module 5	Climate Change: Justice and Future Scenarios
Key Concepts	climate change fairness, justice; future scenarios.
Overview	This module is about climate change scenarios. Socioeconomic scenarios are used by analysts to make projections of future greenhouse gas (GHG) emissions and to assess future vulnerability to climate change. Producing scenarios requires estimates of future population levels, economic activity, the structure of governance, social values, and patterns of

	technological change. Economic and energy modelling (such as via the World3 or the POLES models) can be used to analyse and quantify the effects. These scenarios can be thought of as stories of possible futures. They allow the description of factors that are difficult to quantify, such as governance, social structures, and institutions. However, researcher claim a considerable variety among scenarios, ranging from variants of sustainable development, to the collapse of social, economic, and environmental systems.
Aim	The overriding aim of this module is to equip students with the capacity to actualise issues such as fairness and climate change justice; future climate change scenarios.
Learning Outcomes	At the end of this module learners will be able to contribute to group discussion with regard: • possible future environmental change and identify possible development consequences. • the importance and practical characteristics of adaptive approaches. • The relationship between poverty, environment, climate change, economics and social issues. • climate change and sustainability policy and a range of curricular areas in formal, non formal and informal education.
Units	Unit 5.1: Fairness and climate change justice Unit 5.2: Future climate change scenarios
Readings	• Steve Vanderheiden Climate Change, Fairness, and Equity in *Atmospheric Justice* Published in print June 2008|ISBN: 9780195334609 Published online May 2008 | e-ISBN: 9780199868759 | DOI: http://dx.doi .org/10.1093/acprof:oso/9780195334609.003.0002 http://oxfordindex.oup.com/ view/10.1093/ acprof:oso/9780195334609. 003.0002 • Carter, T.R. *et al*. (2001). "Developing and Applying Scenarios. In: Climate Change 2001: Impacts, Adaptation and Vulnerability. Contribution of

	Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change [J.J. McCarthy *et al*. Eds.]". Cambridge University Press, Cambridge, U.K., and New York, N.Y., U.S.A. Retrieved 2010-01-10. • "Using the Clean Air Act to Sharply Reduce Carbon Pollution from Existing Power Plants". Natural Resources Defense Counsel. Retrieved October 9, 2013. • Morita *et al.*, "Chapter 2, Greenhouse Gas Emission Mitigation Scenarios and Implications", Sec. 2.5.1.1 IPCC Emissions Scenarios and the SRES Process, in IPCC TAR WG3 2001. • Karl, TR, *et al*, ed. (2009), "Global climate change", *Global Climate Change Impacts in the United States*, New York, NY, USA: Cambridge University Press, p. 22, ISBN 978-0-521-14407-0 • Rogner, H.-H., *et al.*, "Introduction", Sec 1.3.2 Future outlook, in IPCC AR4 WG3 2007 • Section 4.4.1, Carbon dioxide emissions from energy supply by 2030, in IPCC AR4 WG3 2007 • IPCC AR4 WG3 (2007), Metz, B.; Davidson, O.R.; Bosch, P.R.; Dave, R.; and Meyer, L.A., ed., *Climate Change 2007: Mitigation of Climate Change*, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, ISBN 978-0-521-88011-4(pb: 978-0-521-70598-1).
Activity	**Overview**

	In groups, students are required to: **1- Explore a variety of resources on** - possible future environmental change and identify possible development consequences. - the importance and practical characteristics of adaptive approaches. - the relationship between poverty, environment, climate change, economics and social issues. - climate change and sustainability policy and a range of curricular areas in formal, non formal and informal education**.** **2- Summarize key ideas on the above issues, to be orally reported.** **3- Discuss the data reported in step (2).** **4- Propose at least three Scenarios that can be applicable to the students local environment.**

Contamination of soil and its treatment

KNOWLEDGE (Concepts, theories,	**SKILLS (Tools, methodologies,**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**

processes)	**dynamics)**		
174. Environmental awareness 175. Strategic planning 176. Environmental awareness 177. Environmental management 178. Technology and innovation 179. Climate change adaptation 180. Risk assessment 181. Climate variability 182. Weather and climate 183. Climate change communication 184. Climate change and health 185. Strategic planning and climate change 186. Role of international institutions 187. Climate change: Science, impacts & scenarios 188. Future climate change scenarios	244. Adaptive learning and self-reflection; 245. Communicating 246. Contextualising 247. Critical, systemic and futures thinking 248. Debating 249. Discourse 250. Futures thinking 251. Leadership 252. Local knowledge 253. Motivate and manage change 254. Problem solving 255. Resolve ethical dilemmas 256. Team management	269. Accountability 270. Confident 271. Decisive 272. Democratic 273. Empathy 274. Environmental justice 275. Openness to novelty and change 276. Optimism 277. Organised 278. Respect and care for the community 279. Respect for diversity 280. Social responsibility 281. Human rights 282. Sense of urgency 283. Human wellbeing 284. Social responsibility 285. Perspective 286. Co-responsibility 287. Systematic 288. Focussed	1. Discuss the sources of domestic, agricultural and industrial wastes and pollutants. 2. Identify the problems arising at pollution sites. 3. Devise solutions to the soil pollution problems. 4. Design soil treatment and water treatment process systems, among environmental processes. 5. Anticipate possible future environmental change and identify possible development consequences. 6. Estimate health impact of changes in soil pollution 7. Identify the different types of soil pollutants.

Course Syllabus

Course Number:

Contamination of soil and its treatment

Port Said University, Faculty of Science, Department of,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of Science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Contamination of Soil and its treatment**

Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to raise the students' awareness of soil . The course concentrates on the techniques employed in the analysis of the physical, hydrological, chemical, and biological properties of soils as well as those processes which control the development of the soil. It introduces students to the fundamentals of soil pollution with a background on historical perspective on soil pollution and a commentary on current soil quality policies and standards. It does so through tackling the following aspects: 1) natural sources of soil pollution, 2) anthropogenic sources of soil pollution, 3) airborne particulate matter, 5) negative impacts, 6) global warming, 7) soil pollution act, 8) atmospheric stability, 9) thermal invasion, 10) modelling of soil pollution and control devices. That is they are asked to read and summarize articles on soil pollution and its treatment. They are invited to discuss impacts of soil pollution on environment at local, national and international scales.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of soil pollution; b) to raise awareness of the learners about effects of soil pollution on climate; c) help learners use traditional and electronic tools to identify the risks the different types of soil pollutants; and d) to identify risks of soil pollution.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

8. Discuss the sources of domestic, agricultural and industrial wastes and pollutants.
9. Identify the problems arising at pollution sites.
10. Devise solutions to the soil pollution problems.
11. Design soil treatment and water treatment process systems, among environmental processes.
12. Anticipate possible future environmental change and identify possible development consequences.

13. Estimate health impact of changes in soil pollution
14. Identify the different types of soil pollutants.

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		History of air pollution;
2		Current policies, standards and objectives;
3		Sources of air pollution;
4		Effects of major air pollutants;
5		Monitoring of emissions and air pollutants in ambient air;
6		Modelling and control of emission from road transport;
7		Modelling and control of emission from industrial sources;
8		Chemistry and dispersion of air pollution in atmosphere;
9		Air pollution modelling approaches;
10		Commercial air quality models (ADMS, USEPA models;
11		Indoor air pollution;
12		Personal exposure to air pollution

The environmental impact assessment for projects

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
189. Environmental awareness 190. Climate change communication 191. Fairness and climate change justice 192. Future climate change scenarios 193. Technology and innovation 194. Climate change implications for integrated coastal planning	257. Adaptive learning and self-reflection; 258. Awareness and advocacy raising 259. Communicating 260. Contextualising 261. Critical, systemic and futures thinking 262. Debating 263. Discourse 264. Futures thinking 265. Integrated assessment 266. Leadership	289. Accountability 290. Confident 291. Decisive 292. Democratic 293. Empathy 294. Environmental justice 295. Openness to novelty and change 296. Optimism 297. Organised 298. Respect and care for the community	**1-** Identify methods and principles of environmental assessment of the impacts of activities and pollutants. 2-Explain the dispersion and ecological distribution of pollutants during discharge and after emission. 3- Discuss the basics of project formulation, relationships between organisms and their environment and managing human, air and soil resources. 4- Explore the influence of economic activities on surrounding environment. 5- Summarize a wide range of laboratory and held methods directly applicable to the study of

195. Risk assessment 196. Climate variability 197. Strategic planning and climate change 198. Role of international institutions 199. Climate change: Science, impacts & scenarios	267. Local knowledge 268. Motivate and manage change 269. Networked learning 270. Prioritising 271. Problem solving 272. Scenario analysis and planning 273. Team management	299. Respect for diversity 300. Social responsibility 301. Transparency 302. Sense of urgency 303. Human wellbeing 304. Human rights 305. Social responsibility 306. Perspective 307. Co-responsibility 308. Systematic 309. Focussed	environmental problems.

Course Syllabus

Course Number:

The environmental impact assessment for projects

Port Said University, Faculty of science, Department of Environmental Sciences,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **The environmental impact assessment for projects**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to provide students with the key concepts about the methods and principles of environmental assessment of the impacts of activities and pollutants (predicting dispersion and ecological distribution of pollutants during discharge and after emission) with the introduction of the basics of project formulation, relationships between organisms and their environment and managing human, air and soil resources, A course which will familiarize students with a wide range of laboratory and held methods directly applicable to the study of environmental problems.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of methods and principles of environmental assessment of the impacts of activities and pollutants; b) to raise awareness of the learners about the need for predicting dispersion and ecological distribution of pollutants during discharge and after emission; c) and help learners to acquire the basics of project formulation, relationships between organisms and their environment and managing human, air and soil resources and d) give the basic understanding of a wide range of laboratory and held methods directly applicable to the study of environmental problems.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Identify methods and principles of environmental assessment of the impacts of activities and pollutants.

2-Explain the dispersion and ecological distribution of pollutants during discharge and after emission.

3- Discuss the basics of project formulation, relationships between organisms and their environment and managing human, air and soil resources.

4- Explore the influence of economic activities on surrounding environment.

5- Summarize a wide range of laboratory and held methods directly applicable to the study of environmental problems.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

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Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Methods and principles of environmental assessment the impacts of activities and pollutants;.
3		the basics of project formulation
4		Relationships between organisms and their environment and managing human, air and soil resources. .
6		The influence of economic activities on surrounding environment.

Water Pollution

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
200. Environmental awareness 201. Climate change communication 202. Fairness and climate change justice 203. Future climate change scenarios 204. Technology and innovation 205. Climate change implications for integrated coastal planning 206. Risk assessment 207. Climate variability 208. Climate change communication 209. Climate change and health 210. Strategic planning and	274. Adaptive learning and self-reflection; 275. Awareness and advocacy raising 276. Communicating 277. Contextualising 278. Critical, systemic and futures thinking 279. Debating 280. Discourse 281. Futures thinking 282. Integrated assessment 283. Leadership 284. Local knowledge 285. Motivate and manage change 286. Networked learning 287. Prioritising 288. Problem solving	310. Accountability 311. Confident 312. Decisive 313. Democratic 314. Empathy 315. Environmental justice 316. Openness to novelty and change 317. Optimism 318. Organised 319. Respect and care for the community 320. Respect for diversity 321. Social responsibility 322. Transparency 323. Sense of urgency 324. Human wellbeing	33. Discuss the sources of domestic, agricultural and industrial wastes and pollutants. 34. Identify the problems arising at pollution sites. 35. Devise solutions to the water pollution problem. 36. Design water treatment and wastewater treatment process systems, among environmental processes. 37. Apply the different steps of the monitoring cycle in rivers and lakes. 38. Anticipate possible future environmental change and identify possible development consequences. 39. Appreciate the positive impacts of utilizing renewable energy resources on the environment. 40. Apply common statistical techniques for water quality data evaluation. 41. Use the different tools and equipments of

climate change 211. Role of international institutions 212. Climate change: Science, impacts & scenarios 213. Future climate change scenarios	289. Resolve ethical dilemmas 290. Scenario analysis and planning 291. Team management	325. Human rights 326. Social responsibility 327. Perspective 328. Co-responsibility 329. Systematic 330. Focussed	renewable energy resources. 42. Apply concepts of water pollution processes in rivers and lakes.

Course Syllabus

Course Number:

Water Pollution

Port Said University, Faculty of Science, Department of Physics,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of Science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Water pollution**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to raise the students' awareness water. It introduces them to the benefits of using clean energy resources. It does so through tackling the following aspects: 1) natural sources of air pollution, 2) anthropogenic sources of air pollution, 3) airborne particulate matter, 4) size distribution of atmospheric aerosols, 5) negative impacts, 6) global warming, 7) air pollution act, 8) atmospheric stability, 9) thermal invasion, 10) modelling of air pollution and control devices. That is they are asked to read and summarize articles on renewable energy resources. They are invited to discuss impacts of energy resources on environment at local, national and international scales. In short, the course provides an appropriate chance for the students to get the minimum knowledge of the advantages and disadvantages of renewable energy resources.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of air pollution; b) to raise awareness of the learners about effects of air pollution on climate; c) help learners use traditional and electronic tools to identify the risks the different types of air pollutants; and d) to highlight

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

43. Discuss the sources of domestic, agricultural and industrial wastes and pollutants.
44. Identify the problems arising at pollution sites.
45. Devise solutions to the water pollution problem.
46. Design water treatment and wastewater treatment process systems, among environmental processes.
47. Apply the different steps of the monitoring cycle in rivers and lakes.

48. Anticipate possible future environmental change and identify possible development consequences.
49. Appreciate the positive impacts of utilizing renewable energy resources on the environment.
50. Apply common statistical techniques for water quality data evaluation.
51. Use the different tools and equipments of renewable energy resources .
52. Apply concepts of water pollution processes in rivers and lakes.

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

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Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Energy Resources and Supply.
3		Renewable energies and clean technologies.
4		Solar Energy, solar cells, solar thermal heating systems, and electricity generation.
5		Tidal and Hydro as renewable energy resources.
6		Renewable Energy Integration and Energy Efficiency in the Built Environment
7		Research Design Methods.

Course Syllabus

Course Number:
Human Rights

Port Said University, Faculty of Education, Department of

Instructor Information

Instructor: Dr. Amal Elarabawy Mahdy
Office Location: Faculty of Education, Port Said University - Egypt
Telephone: 01283844779

Office Hours:
E-mail: prof_amal2012@yahoo.com
Website:

Course Identification

Course Number:
Course Name: Human Rights
Course Location: University Campus
Class Times: 24 hours
Prerequisites:
Faculty Web Page:

Course Description/Overview

Though the political thought cared about the Human rights' issue since ever, this care has not reached the nowadays level but recently; only when the Human rights' issue has become an important issue on the international level during the last decade of the twentieth century. The Human rights' issue has been connected to what distinguish man as a man. This can start with ensuring the right of every child in life even before he is

born. Then, his rights extend to his care all his life, as he has the right in security, assurance, education, accommodation, health besides his right in political participation and expressing his opinion.

This course is divided into five parts: the first is titled: The Essence of Human Rights. It deals with the concept of human rights, its importance, beginnings, and the human rights and the peoples' rights. The second part is titled: Judiciary and Human Rights. It tackles the role of judiciary in maintaining the human rights, and the types of human rights as well. The third part is: The Procedures of Human Rights. It deals with the procedures of Human Rights on the international, regional and national levels. The fourth is titled: Applications of Human Rights. This one discusses the applications in the fields of medicine, engineering, agriculture and science. The fifth is titled: The Islamic and International Declarations of Human Rights, a comparison between the Islamic and International Declarations of Human Rights.

Course Learning Objectives

The overarching goals of this course are:

8. Recognizing the concept of Human Rights and its importance
9. Defining the types of Human Rights
10. Recognizing the procedures of Human Rights, their beginnings and sources
11. Applying Human Rights' procedures in various fields
12. Discussing the restrictions on Human Rights
13. Learning about the historical development of Human Rights and Democracy
14. Determining the relation between Democracy and Human Rights

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

8. Recognize the Human Rights and their procedures

9. State the Civil, Political, Economic and Social Rights
10. Demonstrate the beginnings, sources and procedures of Human Rights
11. Explain some models of Human Rights' Applications on different levels
12. Analyze the Human Rights' procedures on the international, regional and national levels
13. Analyze the international charters of Human Rights
14. Differentiate between the Human Rights in both the Islamic and Western Civilizations

Course Resources

8. Fadl-ullah Muhammad Isma'eil: Human Rights between the Western Thought and the Islamic, Bustan Elma'refa, Alexandria, 2006.
9. Lotfy Mahmoud Abd El-Haleem: Human Rights Between the United Nations' Declarion and the Holy Qur'an, Dar Almisbah, Cairo, 1992.
10. Muhammad El-Ghazaly: Human Rights between the Islamic Instructions and the United Nations' Declaration, Dar Elkotob Elhaditha, Cairo, 1965.
11. Muhammad Abd El-Ma'boud Morsy and al.: Human Rights Suez Canal University, (University Requirement).
12. Muhammad Fathy Othman: Human Rights between the Islamic Law and the Western Legal Thought, Dar El-Shorouk, Beirut, 1982.
13. Muhammad No'man, Egypt and the Human Rights between Truth and Slander (A Documentary Study), The General Egyptian Book Association , Cairo, 1993
14. Muhammad Salam Zanaty, Human Rights (Historical Introduction), 1992.

Course Website(s)

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	40%
Exams	40%
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and

stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Disability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		Human Rights, Concept and Importance
2		Beginnings and Sources of Human Rights

3		Human Rights and Peoples' Rights
4		The Role of judiciary in Maintaining Human Rights
5		Types of Human Rights and the Restrictions on them
6		Human Rights' Procedures on the International Level
7		Human Rights' Procedures on the Regional Level
8		Human Rights' Procedures on the National Level
9		Human Rights' Applications in the field of Engineering, Medicine, Agriculture and Science
10		The Islamic Declaration of Human Rights
11		The International Declaration of Human Rights
12		A Comparison Between The Islamic and International Declarations of Human Rights

APENDIX II: The CLIMASP Course Modules Template Example

Course	
Module 1	
Key Concepts	The Essence of Human Rights
Overview	This module tackles the essence of Human Rights and its importance in establishing societies, the beginnings of Human Rights and the most important factors which paved the way for the Human Right Movement within the society.

Aim	The main objective is to identify the concept of Human Rights, its beginning, and the factors which affected it.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Clarify the Human Rights concept, and its importance. • Recognize the historical development of the concept. • Be exposed to the beginning and the sources of Human Rights
Units	• Human Rights: Concept and Importance • The Beginning and sources of Human Rights • Human Rights and Peoples' Rights
Readings	Muhammad Salam Zanaty, Human Rights (Historical Introducti 1992.
Activity	
	Writing an essay about the essence of Human Rights and its importance in establishing societies.

Module 2	
Key Concepts	Judiciary and Human Rights
Overview	This module deals with the role of justiciary in maintaining the Human Rights as every individual has the rights to have an effective legal tool in the national court specialized in the deeds violating the Human Rights given to individuals by judiciary or constitution. People are equal before judiciary, and therefore have equal protection without any discrimination by judiciary.
Aim	The main aim of this module is recognizing the role and importance of judiciary in maintaining Human Rights, and recognizing the rights given to humans.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Recognize the role of judiciary in maintaining Human Rights • Determine types of Human Rights • Discuss the restrictions on Human Rights
Units	3. The Role of judiciary in maintaining Human Rights 4. Human Rights' Types and Restrictions on them
Readings	Lotfy Mahmoud Abd El-Haleem: Human Rights Between the United Nations' Declarion and the Holy Qur'an, Dar Almisbah,

	Cairo, 1992
Activity	
	Preparing critical researches on some thoughts presented in the content
Module 3	
Key Concepts	Human Rights' Procedures
Overview	This module deals with the procedures necessary for applying the Human Rights within the society as these rights are integrated and no right overwhelms another. Besides, an individual's rights are not separated from the rights of the society. Therefore, procedures are imposed to apply the Human Rights.
Aim	The main goal of this module is recognizing the procedures necessary for applying the Human Rights whether on the international, regional or national levels.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Recognize the Procedures of Applying the Human Rights • Analyze the Human Rights' Procedures on the international, regional or national levels.
Units	4. Human Rights' Procedures on the international level. 5. Human Rights' Procedures on the regional level. 6. Human Rights' Procedures on the national level.
Readings	Muhammad No'man Galal, Egypt and the Human Rights

	between Truth and Slander (A Documentary Study), The General Egyptian Book Association , Cairo, 1993
Activity	Using the Internet in holding a research on the Human Rights' Procedures on the International, Regional and National Levels
Module 4	
Key Concepts	Human Rights' Applications
Overview	This module focuses on how to apply the Human Rights in the field of medicine for maintaining the patient's rights on the physician, in medical treatment, and in sickness confidentiality. In the field of Engineering, the application is held by the syndicate commitment to the laborers' rights. In Agriculture, it is guaranteed by the protection of the new plant species, etc. In Science, Human Rights are applied via maintaining copyrights as well as other applications.
Aim	The main goal of this module is recognizing the most important Human Rights' Applications in different fields.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Identify the Human Rights' Applications in different fields. • Suggest procedures to apply the Human Rights' Applications in different fields.

Units	3. Human Rights' Applications in the fields of Medicine and Engineering 4. Human Rights' Applications in the fields of Agriculture and Science
Readings	Muhammad No'man Galal, Egypt and the Human Rights between Truth and Slander (A Documentary Study), The General Egyptian Book Association , Cairo, 1993
Activity	
	Holding civil researches about how to apply Human Rights on different fields
Module 5	
Key Concepts	The Islamic and International Declarations of Human Rights
Overview	
Aim	To recognize human rights in both the Islamic and European Civilizations and to learn about the international charters of human rights
Learning Outcomes	By the end of this module, learners are expected to be able to: • Differentiate between human rights in both the Islamic and European Civilizations • Analyze the international charters of human rights
Units	4. The Islamic Declaration of Human Rights 5. The International Declaration of Human Rights

	6. A comparison between the Islamic and International Declarations of Human Rights
Readings	Mohammad No'man Galal, Egypt and Human Rights between Truth and Slander (a documentary study), the Egyptian General Association for Books, Cairo, 1993.
Activity	
	Writing an essay that clarifies the most important principals in the Islamic and International Declarations of Human Rights

Hydro geochemistry *and Environment*

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**

214. Environmental awareness 215. Climate change communication 216. Fairness and climate change justice 217. Future climate change scenarios 218. Technology and innovation 219. Climate change implications for integrated coastal planning 220. Risk assessment 221. Climate variability 222. Climate change communication 223. Climate change and health 224. Strategic planning and climate change 225. Role of international institutions 226. Climate change: Science, impacts & scenarios 227. Future climate change scenarios	292. Adaptive learning and self-reflection; 293. Awareness and advocacy raising 294. Communicating 295. Contextualising 296. Critical, systemic and futures thinking 297. Debating 298. Discourse 299. Futures thinking 300. Integrated assessment 301. Leadership 302. Local knowledge 303. Motivate and manage change 304. Networked learning 305. Prioritising 306. Problem solving 307. Resolve ethical dilemmas 308. Scenario analysis and planning 309. Team management	331. Accountability 332. Confident 333. Decisive 334. Democratic 335. Empathy 336. Environmental justice 337. Openness to novelty and change 338. Optimism 339. Organised 340. Respect and care for the community 341. Respect for diversity 342. Social responsibility 343. Transparency 344. Sense of urgency 345. Human wellbeing 346. Human rights 347. Social responsibility 348. Perspective 349. Co-responsibility 350. Systematic 351. Focussed	1. Identify the physical and chemical properties of water. 2. Explain the groundwater origin and genesis, water quality modelling, sources of groundwater pollution,. 3- Discuss weathering and water chemistry. 4- Identify the elements of the climate on the maps using the suitable symbols. 5- Explore the influence of aquifer materials on groundwater quality.

Course Syllabus

Course Number:

Hydro geochemistry *and Environment*

Port Said University, Faculty of science, Department of Environmental Sciences,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of Arts
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Hydro geochemistry and Environment**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to provide students with the key concepts about physical and chemical properties of water, hydrogeochemical processes, influence of aquifer materials on groundwater quality, representations of results of chemical analyses, groundwater origin and genesis, water quality modelling, sources of groundwater pollution, municipal, agricultural, mining, industrial sources, water treatment, the distribution of biota, nutrients and contaminants in the aquatic environment. Topics will include the hydrologic cycle, the carbonate system and pH control, weathering and water chemistry, redox equilibria, and hydrologic transport.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of hydrogeochemical processes and influence of aquifer materials on groundwater quality; b) to raise awareness of the learners about the need for new sources of water needed for irrigation and drink; c) and help learners to acquire water quality modeling: and d) give the basic understanding of hydrologic cycle, carbonate system, weathering and hydrologic transport

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify the physical and chemical properties of water.
2. Explain the groundwater origin and genesis, water quality modelling, sources of groundwater pollution,.
3- Discuss weathering and water chemistry.
4- Identify the elements of the climate on the maps using the suitable symbols.
5- Explore the influence of aquifer materials on groundwater quality.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Water quality modeling.
3		Groundwater origin and genesis
4		Sources of groundwater pollution.
5		*Components and Characteristics* of the Earth's *Atmosphere*
6		Weathering and water chemistry.

Legislation and the laws of Environmental Management

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
228. Environmental awareness 229. Climate change communication 230. Fairness and climate change justice 231. Technology and innovation 232. Risk assessment 233. Climate change and health 234. Strategic planning and climate change 235. Role of international institutions 236. Future climate change scenarios	310. Adaptive learning and self-reflection; 311. Awareness and advocacy raising 312. Communicating 313. Contextualising 314. Critical, systemic and futures thinking 315. Debating 316. Discourse 317. Futures thinking 318. Integrated assessment 319. Leadership 320. Local knowledge 321. Motivate and manage change 322. Networked learning 323. Prioritising 324. Problem solving 325. Resolve ethical	352. Accountability 353. Confident 354. Decisive 355. Democratic 356. Empathy 357. Environmental justice 358. Openness to novelty and change 359. Optimism 360. Organised 361. Respect and care for the community 362. Respect for diversity 363. Social responsibility 364. Transparency 365. Sense of urgency 366. Human wellbeing 367. Human rights	Upon successful completion of this course, students will be able to: 1. Identify the issues arising from the impact of industrial and development policies on the natural environment. 2. Explain the limitations of environmental law. 3- Discuss perspectives, actors, institutions, and economic relationships as they relate to global environmental policy. 4- Identify the methods of evaluation in environmental management. 5- Explore the linkages between the global political system and the natural environment.

	dilemmas 326. Scenario analysis and planning 327. Team management	368. Social responsibility 369. Perspective 370. Co-responsibility 371. Systematic 372. Focussed	

Course Syllabus

Course Number:

Legislation and the Laws of Environmental Management

Port Said University, Faculty of science, Department of Environmental Sciences, Fall Semester

Instructor Information

Instructor: Dr.

Office Location: Faculty of science

Telephone: Office –

Office Hours:

E-mail:

Website:

Course Identification

Course Number:

Course Name: Legislation and the Laws of Environmental Management

Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to provide students with practical and detailed examination of the enactment, enforcement and limitations of environmental law and policy. The course will 'provide a comprehensive overview of environmental law. It critically explores modes of decision-making in contemporary institutions with special emphasis on methods of evaluation in environmental management. Decision analysis, risk assessment and other techniques of 'scientific' decision/evaluation are studied using both theoretical and case-study approaches. The course focuses on perspectives, actors, institutions, and economic relationships as they relate to global environmental policy.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of environmental law; b) to raise awareness of the learners about the need for new methods of evaluation in environmental management; and c) provide students with a solid understanding of linkages between the global political system and the natural environment

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify the issues arising from the impact of industrial and development policies on the natural environment.
2. Explain the limitations of environmental law.
3- Discuss perspectives, actors, institutions, and economic relationships as they relate to global environmental policy.
4- Identify the methods of evaluation in environmental management..
5- Explore the linkages between the global political system and the natural environment.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Domination of Nature.
3		The ethics of scarcity
4		Animal and environmental rights.
5		social benefit and technological risk, and the debate among deep ecologists
6		Social ecologists and eco-feminists over the care of the earth.

Man and Environment

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
19. Environmental awareness 20. Environmental ethics 21. Biodiversity and climate change 22. Climate change adaptation 23. Urbanization's role in climate change 24. Water resources and climate change Social learning processes 25. Risk assessment 26. Climate change and health 27. Pollution and health 28. Gender and climate change 29. Mitigation of pollution	45. Adaptive learning and self-reflection; 46. Awareness and advocacy raising 47. Carbon literacy for procurement 48. Communicating 49. Contextualising 50. Critical, systemic and futures thinking 51. Debating 52. Discourse 53. Emergency psychology 54. Futures thinking 55. Global dynamics 56. Integrated assessment 57. Leadership 58. Local knowledge 59. Mapping gender impacts 60. Motivate and manage change 61. Networked learning 62. Prioritising 63. Problem solving 64. Resolve ethical dilemmas	45. Accountability 46. Confident 47. Decisive 48. Democratic 49. Empathy 50. Environmental justice 51. Gender-sensitive 52. Global mind-set/ consciousness 53. Interdependency 54. Needs vs. wants 55. Nonviolence & peace 56. Openness to novelty and change 57. Optimism 58. Organised 59. Respect and care for the community 60. Respect for diversity 61. Social cohesion 62. Social responsibility 63. Stewardship 64. Tolerance 65. Transparency	27. Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community. 28. Analyse methods of ensuring local participation in climate change adaptation. 29. Analyze the effects of climate change from both male and female perspectives 30. Compare and contrast the impacts of major climatic hazards on human health and the community. 31. Comprehend the significance of the climate change problem locally and globally. 32. Describe the relationship between human activities and climate change. 33. Demonstrate an understanding of the effect of pollution on human health 34. Explore solutions to problems that cause climate change. 35. Identify ways to reduce the school's carbon footprint. 36. Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in. 37. Investigate the mitigation of climate change. 38. Propose solutions to climate change issues.

	65. Scenario analysis and planning 66. Team management	66. Virtue	39. Understand how human actions are contributing to global environmental change.

Course Syllabus

Course Number:

Man and Environment

University of Port Said, Faculty of medicine , Department of Community medicine

Fall Semester, 2013-2014

Instructor Information

Instructor: Prof. EnasElsheikh

Office Location: Faculty of Medicine

Telephone: Office – +20663428168

Office Hours: Tuesday 14.30- 17.00, Wednsday 14.00 – 16.00

E-mail: eelsheikh47@gmail.com

Website:

Course Identification

Course Number: **Γ1**

Course Name: **Man and Environment**

Course Location: Faculty of medicine

Class Times: Wednesday 8:30pm – 11:30am

Prerequisites:
Faculty Web Page: www.psu.edu.eg

Course Description/Overview

Education can be the catalyst for empowering students to become critical, reflective and active citizens. Physician have the potential to be decision maker and practice in the service of educating patients to be active citizens. The present course is intended to raise the students' environmental awareness. It introduces them to the environmental challenges resulting from climate change. It does so through tackling the following logically sequence issues: 1) Environmental awareness; 2)Environmental ethics; 3) Biodiversity and climate change; 4) Climate change adaptation; 5) Urbanization's role in climate change; 6) Water resources and climate change Social learning processes; and 7) natural sources of pollution and man madepollutions 8) air pollution, noise pollution and human activity 9) effect of pollution on health Issues are, however, deeply covered through active participation of the students. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is, they are asked to read and summarize articles on climate changes. They are invited to discuss scenarios for the management of water resources at local, national and international scales. In short, the course provides an appropriate chance for the students practice their role as future citizens.

Course Learning Objectives

The overarching goals of this course are: a) to provide a critical approach to the negative environmental consequences of climate changes – at local, national and international scales -in the context of education for sustainability; b) raise awareness of the role of the learners to reflect critically on the rights, roles and responsibilities of an active citizen in preparing for the management of critical environmental issues; and c) use traditional and electronic resources as well as social networking technologies as tools tohelp the community, including children, identify risks and develop climate change adaptation strategies. d) to raise the awareness of the learner about the need to examine physical, chemical, biological, political and economic dimension of environment

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

- Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community.
- Discuss the basic terminology and core concepts of environment
- Identify the physical chemical biological political and economic dimension of environment
- Conduct survey of environmental system , human interaction
- Analyse methods of ensuring local participation in climate change adaptation.
- Analyze the effects of climate change from both male and female perspectives
- Compare and contrast the impacts of major climatic hazards on human beings and the community.
- Comprehend the significance of the climate change problem locally and globally.
- Describe the relationship between human activities and climate change.
- Describe the relationship between poverty and unsafe environment
- Demonstrate an understanding of the different types of pollutions and its impact on human health
- Explore solutions and mitigation process to problems that cause climate change.
- Identify ways to reduce the impact of climate changes
- Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in.
- Investigate the causes of climate change and pollution
- Propose solutions to climate change issues.
- Understand how human actions are contributing to global environmental change. Course Resources

Course Website(s)

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class
- Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness &id=7141986**
- **Paul Pojman**Environmental Ethics: Readings in Theory and ApplicationPaperback – January 1, 2007
- Oxford Dictionary of Philosophy: environmental ethics,**http://www.answers**.com/topic/environmental-ethics
- Doucet, C. (2007) *Urban Meltdown: Cities, Climate Change and Politics as Usual*, New Society Publishers, Gabriola Island BC.
- Dow, K. and Downing, T. (2006) *The Atlas of Climate Change: Mapping the World's Greatest Challenge*, University of California Press, Berkeley.
- Hansen, J. (2010) *Storms of My Grandchildren: The Truth about the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, Bloomsbury, New York.
- Henson, R. (2008) *The Gough Guide to Climate Change: The Symptoms, The Science, The Solutions*, Rough Guides, London.
- Holper, P. and Torok, S. (2008) *Climate Change: What You Can do about It at Work, at Home, at School*, Pan Macmillan,Sydney.
- Hulme, M. (2009) *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*, Cambridge University Press, Cambridge.
- Johansen, B. (2006) *Global Warming in the Twenty-First Century*, Praeger Publishers, Westport CT.
- CCSP (2008). *Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Julius, S.H., J.M. West (eds.), J.S. Baron, B. Griffith, L.A. Joyce, P. Kareiva, B.D. Keller, M.A. Palmer, C.H. Peterson, and J.M. Scott (authors). U.S. Environmental Protection Agency, Washington, DC, USA.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Environmental awareness
3		Environmental ethics
4		Biodiversity and climate change /health
5		Climate change adaptation / health
6		Urbanization's role in climate change /health
7		Water resources and climate change Social learning processes (FORUM 1)
8		Air pollution and climate change Social learning processes (FORUM 2)
9		Gender and climate change Social learning processes (FORUM 3)
10-15		Mitigation and health (concepts, feasibility and consequences, techniques, national and international models)

Course Modules

Course	Man and Environment
Module 1	Environment: Ethics and Awareness
Key Concepts	Environmental awareness, Environmental ethics
Overview	Environmental awareness is to understand the fragility of our environment and the importance of its protection. Promoting environmental awareness is an easy way to become an environmental steward and participate in creating a brighter future for our children.To define environmental awareness we must first understand the environmentalist movement. Environmentalism is an ideology that evokes the necessity and responsibility of humans to respect, protect, and preserve the natural world from its anthropogenic (caused by humans) afflictions. Environmental awareness is an integral part of the movement's success. By teaching our students, friends and family that the physical environment is fragile and indispensable. Students need to start fixing the problems that threaten it. Environmental ethics, on the other hand, is the part of environmental philosophy which considers extending the traditional boundaries of ethics from solely including humans to including the non-human world. It exerts influence on a large range of disciplines including environmental law, environmental sociology, ecotheology, ecological economics, ecology and geography. There are many ethical decisions that human beings make with respect to the environment. Throughout this module, students are invited to share and exchange ideas about issues related to :clear cut forests for the sake of human consumption, propagation of species, gasoline powered vehicles, etc.
Aim	The overriding aim of this module is to turn students able to discourse how human actions are contributing to global environmental change.
Learning	At the end of this module learners will be able to:

Outcomes	• Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community. • understand how human actions are contributing to global environmental change.
Units	Unit 1.1:Environmental awareness Unit 1.2: Environmental ethics
Readings	• Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness&id=7141986** • **Paul Pojman**Environmental Ethics: Readings in Theory and ApplicationPaperback – January 1, 2007 • Oxford Dictionary of Philosophy: environmental ethics, **http://www.answers**.com/topic/environmental-ethics
Activity	**Overview** Assignment 1.1: Reflecting Upon the following issues: • clear cut forests for the sake of human consumption. • propagating our species, and life itself. • make gasoline powered vehicles. • environmental obligations needed to keep for future generations. • the extinction of a species for the convenience of humanity. • Methods for best use and conserve of the space environment to secure and expand life.
Module 2	Biodiversity and Climate Change
Key Concepts	Biodiversity, Climate, Climate Change
Overview	In the atmosphere, gases such as water vapour, carbon dioxide, ozone, and methane act like the glass roof of a greenhouse by trapping heat and warming

	the planet. These gases are called greenhouse gases. The natural levels of these gases are being supplemented by emissions resulting from human activities, such as the burning of fossil fuels, farming activities and land-use changes. As a result, the Earth's surface and lower atmosphere are warming, and this rise in temperature is accompanied by many other changes. Rising levels of greenhouse gases are already changing the climate. These changes are affecting the entire world, from low-lying islands in the tropics to the vast polar regions. Also, Climate change affects biodiversity. It becomes one of the most significant drivers of biodiversity loss by the end of the century. It is already forcing biodiversity to adapt either through shifting habitat, changing life cycles, or the development of new physical traits. In this module, students need to realize that, conserving natural terrestrial, freshwater and marine ecosystems and restoring degraded ecosystems (including their genetic and species diversity) is essential for human well-being. Biodiversity can support efforts to reduce the negative effects of climate change. Conserved or restored habitats can remove carbon dioxide from the atmosphere, thus helping to address climate change by storing carbon (for example,reducing emissions from deforestation and forest degradation). Moreover, conserving in-tact ecosystems, such as mangroves, for example, can help reduce the disastrous impacts of climate change such as flooding and storm surges.
Aim	The overriding aim of this module is to realize the interrelationship between biodiversity and climate change
Learning Outcomes	Students will be able to: • Analyse methods of ensuring local participation in climate change adaptation. • Analyze the effects of climate change from both male and female perspectives
Units	Unit 2.1: Biodiversity, Climate,

	Unit 2.2: Climate Change Unit 2.3: Climate Change Adaptation
Readings	Shah, Anup. "Biodiversity." *Global Issues*. 19 Jan. 2014. Web. 10 Sep. 2014. <http://www.globalissues.org/issue/169/biodiversity>. • Doucet, C. (2007) *Urban Meltdown: Cities, Climate Change and Politics as Usual*, New Society Publishers, Gabriola Island BC. • Dow, K. and Downing, T. (2006) *The Atlas of Climate Change: Mapping the World's Greatest Challenge*, University of California Press, Berkeley. • Flannery, T. (2005) *The Weather Makers: How Man is Changing the Climate and What It Means for Life on Earth*, Atlantic Monthly Press NY. • Hansen, J. (2010) *Storms of My Grandchildren: The Truth about the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, Bloomsbury, New York. • Henson, R. (2008) *The Gough Guide to Climate Change: The Symptoms, The Science, The Solutions*, Rough Guides, London.
Activity	**Overview**
	Work in group to: - Collect information on biodiversity in your local environment. - Collect evidence on the effects of climate changeon biodiversity in your local environment during the last fifty years. - Propose a strategy to protect biodiversity in your local environment.
Module 3	**Urbanization and Climate Change**
KeyConcepts	Urbanization
Overview	This Module deals with the implications of population growth and urbanization for climate change in terms of the contribution of urban populations (and centres) to human induced climate change. It emphasizes how it is not the

	growth in (urban or rural) population but the growth in consumption that drives the growth in greenhouse gas emissions and that a significant proportion of the world's urban (and rural) population have consumption levels that are so low that they contribute little or nothing to such emissions. In this module students discuss how in the much-needed planning for global emissions reduction, provisions must be made to allow low-income low-consumption households with greenhouse gas emissions below the 'fair-share' level to increase their consumption.
Aim	This module aims at examining the relationship between urbanization and climate change.
Learning Outcomes	At the end of this module learners will be able to: • Describe the relationship between human activities and climate change. • Demonstrate an understanding of the natural carbon cycle.
Units	Unit 3.1: Urbanization *Unit 3.2: Urbanization a Mixed Blessing* Unit 3.3: Urbanization and Climate Change
Readings	• David Satterthwaite The implications of population growth and urbanization for climate change, Paper presented at Expert-Group Meeting on Population Dynamics and Climate Change, UNFPA and IIED In Collaboration with UN-HABITAT and the Population Division, UN/DESA 24 to 25 June 2009 • Holper, P. and Torok, S. (2008) *Climate Change: What You Can do about It at Work, at Home, at School*, Pan Macmillan,Sydney. • Hulme, M. (2009) *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*, Cambridge University Press, Cambridge. • Johansen, B. (2006) *Global Warming in the Twenty-First Century*, Praeger

	Publishers, Westport CT. • Moser, S. and Dilling, L. (eds) (2007) *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*, Cambridge University Press, Cambridge.
Activity	**Overview**
	Assignment : Prepare a lecture either of following themes 5. Urbanization: cons and pros 6. Urbanization and Carbon Cycle
Module 4	Water Resources and Climate Change
Key Concepts	Water resources management, Social learning processes
Overview	Water resources are important to both society and ecosystems. We depend on a reliable, clean supply of drinking water to sustain our health. We also need water for agriculture, energy production, navigation, recreation, and manufacturing. Many of these uses put pressure on water resources, stresses that are likely to be exacerbated by climate change. In many areas, climate change is likely to increasewater demand while shrinking water supplies. This shifting balance would challenge water managers to simultaneously meet the needs of growing communities, sensitive ecosystems, farmers, ranchers, energy producers, and manufacturers. In this module need to realize that in some areas, water shortages will be less of a problem than increases in runoff, flooding, or sea level rise. These effects can reduce the quality of water and can damage the infrastructure that we use to transport and deliver water.
Aim	The overriding aim of this module is realize the interrelationship between water resources management and climate change
Learning Outcomes	At the end of this module learners will be able to: • Compare and contrast the impacts of major climatic hazards on livelihoods

	of the community. • Comprehend the significance of the climate change problem locally and globally. • Explore solutions to problems that cause climate change.
Units	Unit 4.1: Water Resources and Climate Change Unit 4.2: Climate change Social learning processes
Readings	• CCSP (2008). *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States*. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Backlund, P., A. Janetos, D. Schimel, J. Hatfield, K. Boote, P. Fay, L. Hahn, C. Izaurralde, B.A. Kimball, T. Mader, J. Morgan, D. Ort, W. Polley, A. Thomson, D. Wolfe, M. Ryan, S. Archer, R. Birdsey, C. Dahm, L. Heath, J. Hicke, D. Hollinger, T. Huxman, G. Okin, R. Oren, J. Randerson, W. Schlesinger, D. Lettenmaier, D. Major, L. Poff, S. Running, L. Hansen, D. Inouye, B.P. Kelly, L Meyerson, B. Peterson, and R. Shaw. U.S. Environmental Protection Agency, Washington, DC, USA. • Kundzewicz, Z.W., L.J. Mata, N.W. Arnell, P. Döll, P. Kabat, B. Jiménez, K.A. Miller, T. Oki, Z. Sen, and I.A. Shiklomanov (2007). Freshwater resources and their management. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability*. EXIT Disclaimer *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds.)]. Cambridge University Press, Cambridge, United Kingdom. • CCSP (2009). *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region*. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Titus, J.G.

	(Coordinating Lead Author), Anderson, K.E., Cahoon, D.R., Gesch, D.B., Gill, S.K., Gutierrez, B.T., Thieler, E.R., Williams, S.J. (Lead Authors). U.S. Environmental Protection Agency, Washington, DC, USA. • CCSP (2008). *Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Julius, S.H., J.M. West (eds.), J.S. Baron, B. Griffith, L.A. Joyce, P. Kareiva, B.D. Keller, M.A. Palmer, C.H. Peterson, and J.M. Scott (authors). U.S. Environmental Protection Agency, Washington, DC, USA.
Activity	**Overview**
	• **Assignment**:plan a seminar on major climatic hazards on livelihoods of the community comparingthe problems of water shortages and those of water increases
Module 5	**Water Management and Recycling**
Key Concepts	Water management and recyclingprocesses, techniques
Overview	Water cycle is a delicate balance of precipitation, evaporation, and all of the steps in between. Warmer temperatures increase the rate of evaporation of water into the atmosphere, in effect increasing the atmosphere's capacity to "hold" water.Increased evaporation may dry out some areas and fall as excess precipitation on other areas.Changes in the amount of rain falling during storms provide evidence that the water cycle is already changing. Rising temperatures cause snow to begin melting earlier in the year. This alters the timing of streamflow in rivers that have their sources in mountainous areas. As temperatures rise, people and animals need more water to maintain their health and thrive. Many important economic activities, like producing energy at power plants, raising livestock, and growing food crops, also require water. The amount of water available for these activities may be reduced as Earth warms, and if competition for water resources increases.
Aim	The overriding aim of this module is to equip students with the capacity to

	debate on water management and recycling processes, techniques and feasibility>
Learning Outcomes	At the end of this module learners will be able to: • Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in. • Investigate the causes of climate change. • Propose solutions to climate change issues.
Units	Unit 5.1: Water management (concepts; national and international models) Unit 5.2: Water recycling techniques feasibility and consequences
Readings	• United Nations Development Programme (2007) *Fighting Climate Change: Human Solidarity in a Divided World: Human Development Report 2007-2008*, Palgrave Macmillan, Basingstoke, UK. • *Layperson's Guide to Water Recycling and Reuse*, published in 1992 by the Water Education Foundation, Sacramento, California. • Video, entitled *Water from Water: Recycling*, produced in 1995 by National Water Research Institute, Fountain Valley, California. • Research On Recycled Water is done by EPA through the Office of Research and Development. • Water Recycling and Reuse: The Environmental Benefits http://www.epa.gov/region9/water/recycling/
Activity	**Overview**
	Students are to plan and implement three-sessions workshop on the following themes: • Water management (concepts; national and international models) • Water recycling techniques feasibility and consequences

MAPPING COURSES RELATED TO CLIMATE CHANGE EDUCATION AND SUSTAINABLE DEVELOPMENT				
	COURSE NAME	FACULTY	NAME OF INSTRUCTOR	SHORT DESCRIPTION OF THE COURSE
1	Fish adaptation and climatic change	Fish and fisheries technology	Dr Ahmed Otify	Scientific bases of climate change and the greenhouse effect on earth and Fisheries. Greenhouse gases and carbon dioxide emissions. The land as a container for the storage of carbon emissions and ways to monitor the degradation of land and water resources as a result of climate change. The role of farming plants in reducing the impact of carbon dioxide and the use of computer models in the management of climate change.
2	Paleoecology Course	Science	Prof Abdel- ziz Tantawy	Overview of environmental changes through time, local environmental changes and regional to global climate change of the past, synecology of fossils, paleobiodiversity, changes in communities over geologic time, stable isotopes of oxygen and carbon, paleotemperature. Objectives - to learn and apply methods for determining how environments and climate on Earth have changed through time.

				Learning Outcomes - an understanding of how paleoenvironments and paleoclimate change are studied in the field and lab, and major changes that have occurred.
3	Economic Geology	Science	Dr. Ashraf Emam	This course is an introduction to the geologic and economic factors that result in the development of commercial concentrations of non-energy mineral resources. Course content varies depending on the interests and backgrounds of the students each semester (course may be repeated for credit). Emphasis will be placed on the descriptive geology and origin of economic mineral concentrations within the context of their overall geologic settings. The geologic and economic nature of metallic and industrial mineral commodities in both "hard rock" and "soft rock" geologic environments will be discussed. Related topics to be discussed include importance of mineral resources to the global economy, mineral exploration and evaluation, and mineral extraction and processing
4	Flora	Science	Prof Mohamed sheded	Plants are grouped into floras based on region, period, special environment, or climate. Regions can be geographically distinct habitats like mountain vs. flatland. Floras can mean plant life of a historic era as in fossil flora. Lastly, floras may be subdivided by special environments. The course study plant life occurring in a particular region or time, generally the naturally occurring

				or indigenous—native plant life.
5	Plant community	Science	Prof Mohamed sheded	Study the plant distribution and taxonomy in different regions in Egypt with relation to soil and climatic factors which effect of the distribution of these species.
6	Plant Ecology	Science	Dr Usama Mahalel	Climatic factors affecting on the plant environment and how it effect on the plant cover. Climatic factors effect on soil type and soil formation. The negative and passive relationships among the biotic components of the environment.
7	Ecology of Algae	Science	Dr Ahmed El-Otify	Environment of algae and effects of climatic factors such as light temperature on life cycle of algae and its biomass. Phytoplankton blooming in relation with climatic change.
8	Environmental Geology	Science	Dr. Ashraf Emam	Environmental geology is a science which objectively studies geologic information and applies it to contemporary environmental problems such as pollution, waste management, resource extraction, natural hazards, and human health. An environmental geologist might evaluate the risk and damage potential from natural hazards such as floods, landslides, volcanoes, or earthquakes. The environmental changes on local to global scales can be placed into an earth systems science perspective through examining the evolution and structure of our planet's components, and how these components naturally

				interact. This course is designed to introduce students to the relationship between humans and our Earth. It focuses on environmental and geosciences subjects that facilitate greater awareness of the interactions between the different Earth's components. The course discusses the geologic processes that shape the surface of the Earth, and how these processes affect and are affected by human activity. Moreover, the relationships between the lithosphere, hydrosphere, and atmosphere will be discussed. Particular attentions are given to the subjects of soil, mineralogy, biogeochemical cycles, climate change, and pollution by human activities. The scientific methods that allow studying, prediction, and mitigation of environmental problems will be discussed.
9	Biostatistics	Science	Dr Adel Abdel -Faheem	The course deals with the data come from Biology. The functions of Biostatics are collecting data and organized it, then it can be easily analysis and studying. Making the decisions one strongly depend on the analyses of the data.
10	Engineering and energy history	Engineering	Dr. Mohamed Shaaban	By the end of the course the students will be able to Know: the engineering history in different fields. Know the energy and different sources of it. Know different fields and different programs of engineering Know about the engineer jobs in different pogroms. Understand the engineering

				job ethics
11	Project management	Engineering	Dr. Muntasser Dwidar	By the end of the course the students will be able to: Know The concept and the elements of management: concept of management - Elements of management. - The concept of marketing: define of marketing, The importance of marketing, - The marketing system. Organizing of the marketing functions: Definition of organizing, The organizing of the marketing functions. Consumer behavior: The concept of the consumer behavior, The aspects of the consumer behavior, Studying the markets. The product strategy: The product mix, The product life cycle, New products. The pricing strategy: The importance of pricing, Methods of pricing. Distribution strategy: Distribution channels, Distribution outlets.
12	Thermodynamics fundamentals	Engineering	Dr Waleed Abdel_Fadeel	- By the end of the course the students will be able to: Define the concept of the energy, and different basic concepts like properties, state, process, equilibrium, and cycles. -Identify the different between the ideal gases and the pure substance and understand the property relations relevant to engineering thermodynamics and how to deal with thermodynamic tables. -Identify the concept of energy and mass conservation and apply this concept on different applications
13	Energy conversion and utilization	Engineering	Dr.Ezzat Gad	**By the end of the course the students will be able to:** Demonstrate knowledge and

				understanding of electromechanical energy conversion principles for electromagnetic and electrostatic systems. - Understand the traction systems. - Recognize and analyze illumination and heating systems. - Analyze and understand essential industrial drives aspects. -The student shall attain the above mentioned objectives efficiently under controlled guidance and supervision. -To recognize the concepts and basics of electric power transmission and distribution theory.
14	Heat and mass transfer	Engineering	Dr. Mahmuod Hasan	By the end of the course the students will be able to: - Demonstrate knowledge of heat transfer definitions and terminology, including heat flux, thermal conductivity, and heat transfer coefficients. - Demonstrate knowledge of conduction and the equivalent resistance formula, convective and use of the overall heat transfer coefficient, radiant heat transfer, including black bodies, gray bodies and emissivity. - Demonstrate knowledge of heat exchangers, including the different types and how they operate, application. - Demonstrate knowledge of mass transfer definition and compare it with convenient heat transfer. - Apply this knowledge on various engineering application. - Share ideas and work in a team in an efficient and effective manner under controlled supervision or independently.

15	Renewable energy resources industrial	Engineering	Dr. Salama Abdel-Hady	By the end of the course the students will be able to: Identity different renewable energy, resources for power production such as wind, Solar, and non-conventional by hydro-power. Recognize natural sources of wind and solar ? energies in Egypt. Practice the operation and Design of Horizontal and Vertical Axis wind Turbines. Practice the Operation and Design of Solar flat plate collectors, concentrator systems, photovoltaic systems and other solar applications. Practice the operation of non-conventional hydro Power Systems Such as wave Energy and Tidal Energy. Recognize other renewable energy technologies such as Biomass, Ocean Thermal Energy …etc.
16	Pollution	Engineering	Dr. Mohamed Fathi	By the end of the course the students will be able to know: definition of pollution- Sources of pollution - Types of pollution and their effect on lumen health. Methods of measurement - methods of pollutant reduction.
17	Social Science rural and urban	Social Work	Dr. Mohamed Nagdy	Study the traditionally associated with the study of social structure and conflict rural areas although topical areas such as food and agriculture or natural resource access transcend traditional rural spatial boundaries
18	Introduction to Social Welfare	Social Work	Dr Mohamed Gaber Abbas	Study the social welfare function as t rank social states (alternative complete descriptions of the society) as less desirable, more desirable, or

				indifferent for every possible pair of social states. Inputs of the function include any variables considered to affect the economic welfare of a society. In using welfare measures of persons in the society as inputs, the social welfare function is individualistic in form. One use of a social welfare function is to represent prospective patterns of collective choice as to alternative social states.
19	Community health	Social Work	Dr Modather Seleem	This course is an introduction to the theory and practice of public and community health. The influence of public health professionals on the past, present and future health status of society through the examination of critical health issues will be described. Programming models, theories and policy development are included
20	Introduction to Social planning	Social Work	Dr. Kawther Kenawy	Speaking of this decision for the basis of and methods entrances and planning mechanisms for social programs and social services and is also interested in general political social.
21	Social work in one of the developed fields	Social Work	Dr Ali Dandarawy	This course deals with social service in the field of environment and sustainable development and to support community-based organizations working in the field of environment.
22	Populations and Environmental Studies	Social Work	Dr. Mohamded Abdel-Razik Dr. Mohamed Sayed	This course focuses on both sides, the first dimension of the population is interested in different societies, and the second deals with the concepts of environmental and environmental problems in the community

23	Environmental studies	Education	Dr Saied Sadeek	Knowledge of environmental concepts such as the environment and environmental pollution study the main features of the program to protect the environment. Identify the role of education in the face of environmental problems. Compare between the environment and environmental education.
24	Principles of Psychology	Education	Dr Adel Abaady	Study different types of psychology such as Environmental Psychology and the environmental factors that affect human health.
25	Adult education and environment Work	Education	Dr Abde Hay Mohamed Ali	This course aims to give a general idea about the importance of adult education and literacy as a requirement necessary for the development of society, especially in the current era, which is characterized as the era of knowledge it is true that there will be individuals in the community do not know how to read and write. In addition the environmental problems that affect individuals

Remote sensing and geology pictorial

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
237. Environmental awareness 238. Climate change communication 239. Fairness and climate change justice 240. Technology and innovation 241. Risk assessment 242. Climate variability 243. Strategic planning and climate change 244. Role of international institutions 245. Climate change: Science, impacts & scenarios	328. Adaptive learning and self-reflection; 329. Awareness and advocacy raising 330. Communicating 331. Contextualising 332. Critical, systemic and futures thinking 333. Debating 334. Discourse 335. Futures thinking 336. Integrated assessment 337. Leadership 338. Local knowledge 339. Motivate and manage change 340. Networked learning 341. Prioritising 342. Problem solving 343. Resolve ethical	373. Accountability 374. Confident 375. Decisive 376. Democratic 377. Empathy 378. Environmental justice 379. Openness to novelty and change 380. Optimism 381. Organised 382. Respect and care for the community 383. Respect for diversity 384. Social responsibility 385. Transparency 386. Sense of urgency 387. Human wellbeing 388. Human rights	1. Identify the types of remote sensing. 2. Explain the principles and process of remote sensing. 3- Discuss the different remote sensing systems. 4- Differentiate between the active and passive sensors. 5- Explore the remote sensing platforms.

	dilemmas 344. Scenario analysis and planning 345. Team management	389. Social responsibility 390. Perspective 391. Co-responsibility 392. Systematic 393. Focussed	

Course Syllabus

Course Number:

Remote sensing and Geology Pictorial

Port Said University, Faculty of science, Department of Environmental Sciences,

Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **remote sensing and geology pictorial**

Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to provide students with the key concepts about the remote sensing, collection of data, sensing devices, evaluation of the collected data, applications of remote sensing techniques in geological purposes, image data processing, image rectification processing, image display and enhancement processing, edge enhancement processing, digital mosaics processing, contrast stretching processing, color composition, principle component analysis (PCA), decorrelation stretch , aerial photography, (elements, airphoto interpretation (instrumentation and procedures), principles of landform identification and evaluation, applications of aerial photographs in geology), earth resources satellites, multispectral scanners, digital image processing, applications of remote sensing and geographic information systems in geology.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of applications of remote sensing techniques in geological purposes; b) to train learners in geographic information systems and remote sensing as applied to geological exploration c) and help learners to

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify the types of remote sensing.
2. Explain the principles and process of remote sensing.
3- Discuss the different remote sensing systems.
4- Differentiate between the active and passive sensors.
5- Explore the remote sensing platforms.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Concept of remote sensing.
3		Sensor on the ground, in the air and in the space
4		Elements of climate.
5		Types of remote sensing
6		Applications of remote sensing techniques in geological purposes.

Renewable Energy

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
246. Environmental awareness 247. Renewable energy technologies 248. Energy efficiency behaviour 249. Technology and innovation 250. Climate change policy 251. Climate change adaptation 252. Sustainable consumption and production 253. Sustainable communities 254. Sustainable construction 255. Environmental awareness 256. Climate change: Science, impacts &	346. Dealing with uncertainty 347. Adaptive learning and self-reflection; 348. Awareness and advocacy raising 349. Communicating 350. Contextualising 351. Critical, systemic and futures thinking 352. Debating 353. Discourse 354. Futures thinking 355. Integrated assessment 356. Leadership 357. Local knowledge 358. Mapping gender impacts 359. Motivate and manage change 360. Networked learning	394. Accountability 395. Confident 396. Decisive 397. Democratic 398. Empathy 399. Environmental justice 400. Openness to novelty and change 401. Optimism 402. Organised 403. Respect and care for the community 404. Respect for diversity 405. Social responsibility 406. Sense of urgency 407. Human wellbeing 408. Human rights 409. Solidarity	53. Explain the impacts of traditional energy resources on environment. 54. Compare and contrast the advantages and disadvantages of renewable energy resources with the advantages and disadvantages of traditional energy resources. 55. Identify the basic principles of renewable energy technologies. 56. Question the relation between sustainable development and the use of renewable energy resources. 57. Discuss the different types of renewable energy resources. 58. Anticipate possible future environmental change and identify possible development consequences. 59. Appreciate the positive impacts of utilizing renewable energy resources on the environment. 60. Explain the relationship between poverty,

scenarios 257. Sustainable development and resilience 258. Future climate change scenarios	361. Prioritising 362. Problem solving 363. Resolve ethical dilemmas 364. Scenario analysis and planning 365. Team management	410. Perspective 411. Co-responsibility 412. Systematic 413. Focussed	environment, climate change, and the insufficient supply of energy. 61. Use the different tools and equipments of renewable energy resources.

Course Syllabus

Course Number:

Renewable Energy

Port Said University, Faculty of Science, Department of Physics,
Fall Semester

Instructor Information

Instructor:
Office Location: Faculty of Science Campus
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **renewable energy**
Course Location: University Campus
Class Times:
Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to raise the students' awareness of renewable energy resources. It introduces them to the benefits of using clean energy resources. It does so through tackling the following aspects: 1) traditional and renewable energy resources; 2) impact of energy consumption on environment; 3); clean energy resources and climate change; 4) availability of solar and wind energy in Egypt; and 5) energy and future global climate change. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is they are asked to read and summarize articles on renewable energy resources. They are invited to discuss impacts of energy resources on environment at local, national and international scales. In short, the course provides an appropriate chance for the students to get the minimum knowledge of the advantages and disadvantages of renewable energy resources.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of the renewable energy resources; b) to raise the learners' awareness of the need to explore renewable energy resources in order to achieve the goals of community development; c) help learners use traditional and electronic tools to identify the risks of the petroleum and natural gas limitations in Egypt; and d) to highlight the importance of renewable energy resources as clean and safe resources to the environment.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

62. Explain the impacts of traditional energy resources on environment.
63. Compare and contrast the advantages and disadvantages of renewable energy resources with the advantages and disadvantages of traditional energy resources.
64. Identify the basic principles of renewable energy technologies.
65. Question the relation between sustainable development and the use of renewable energy resources.
66. Discuss the different types of renewable energy resources.

67. Anticipate possible future environmental change and identify possible development consequences.
68. Appreciate the positive impacts of utilizing renewable energy resources on the environment.
69. Explain the relationship between poverty, environment, climate change, and the insufficient supply of energy.
70. Use the different tools and equipments of renewable energy resources .

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

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Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Energy Resources and Supply.
3		Renewable energies and clean technologies.
4		Solar Energy, solar cells, solar thermal heating systems, and electricity generation.
5		Tidal and Hydro as renewable energy resources.
6		Renewable Energy Integration and Energy Efficiency in the Built Environment
7		Research Design Methods.

Scientific Culture

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
259. Environmental awareness 260. Weather and climate 261. Climate change and livelihoods 262. Gender-sensitive response to climate change 263. Climate change communication 264. Fairness and climate change justice 265. Future climate change scenarios	366. Adaptive learning and self-reflection; 367. Awareness and advocacy raising 368. Carbon literacy for procurement 369. Communicating 370. Contextualising 371. Critical, systemic and futures thinking 372. Debating 373. Discourse 374. Emergency psychology 375. Futures thinking 376. Global dynamics 377. Integrated assessment 378. Leadership 379. Local knowledge 380. Mapping gender impacts 381. Motivate and manage change	414. Accountability 415. Confident 416. Decisive 417. Democratic 418. Empathy 419. Environmental justice 420. Gender-sensitive 421. Global mind-set/ consciousness 422. Interdependency 423. Needs vs. wants 424. Nonviolence & peace 425. Openness to novelty and change 426. Optimism 427. Organised 428. Respect and care for the community 429. Respect for diversity	15. Become familiar with the basic terminology and core concepts of climate change adaptation planning. 16. Identify the most likely impacts of local climatic hazards. 17. Articulating what good climate resilient development actually look like. 18. Compare local problems with problems elsewhere and to gain adaptation ideas from this comparison. 19. Comprehend the opportunities for planners and the social, economic and ecological risks of climate change. 20. Understand historical community reactions to and coping strategies for climatic hazards. 21. Contribute to the debate on global environmental change and societal adaptation strategies; to become an informed citizen and decision maker. 22. Demonstrate capacities for self-reflection and self-evaluation as integral aspects of the adaptive learning cycle.

	382. Networked learning 383. Prioritising 384. Problem solving 385. Resolve ethical dilemmas 386. Scenario analysis and planning 387. Team management	430. Social cohesion 431. Social responsibility 432. Stewardship 433. Tolerance 434. Transparency 435. Virtue	23. Questioning business as usual can threaten our ideals, values, beliefs, business strategies and technical understanding and is not necessarily what everyone wants to hear. 24. Draw on active teaching and learning approaches to empower learner, young people and civic engagement. 25. Anticipate possible future environmental change and identify possible development consequences. 26. Appreciate the importance and practical characteristics of adaptive approaches. 27. Demonstrate knowledge and understanding of relationship between poverty, environment, climate change, economics and social issues. 28. Relate climate change and sustainability policy to a range of curricular areas in formal, non formal and informal education.

Course Syllabus

Course Number:

Scientific Culture

University of Port Said, Faculty of Education, Department of Curricula and Methods of Teaching,

Fall Semester, 2013-2014

Instructor Information

Instructor: Dr, Mahmoud Mohammed Mohasseb

Office Location: Faculty of Education Campus

Telephone: Office –

Office Hours: Tuesday 14.30- 17.00, Wednsday 14.00 – 16.00

E-mail:

Website:

Course Identification

Course Number: **Γ0**

Course Name: **Scientific Culture**

Course Location: University Campus

Class Times: Wednesday 8:30pm – 11:30am

Prerequisites:

Faculty Web Page:

Course Description/Overview

Education can be the catalyst for empowering students to become critical, reflective and active citizens. Teachers have the potential to be what Giroux and McLaren described as transformative intellectuals who combine scholarly reflection and practice in the service of educating students to be thoughtful, active citizens. The present course is intended to raise the students' environmental awareness. It introduces them to the challenges resulting from climate change. . It does so through tackling the following logically sequenced six issues: 1) Weather and climate; 2) Climate change and livelihoods; 3) Gender-sensitive response to climate change; 4) Climate change communication; 5) Fairness and climate change justice; and 6) Future climate change scenarios. Issues 3-6 are, however, deeply covered through active participation of the students. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is they are asked to read and summarize articles on climate changes. They are invited to discuss scenarios for the management of climate changes at local, national and international scales. In short, the course provides an appropriate chance for the students practice their role as future citizens.

Course Learning Objectives

The overarching goals of this course are: a) to provide a critical approach to the consequences of climate changes – at local, national and international scales - in the context of education for sustainability; b) raise awareness of the role of the learners to reflect critically on the rights, roles and responsibilities of an active citizen in preparing for a sustainable future for all; and c) use traditional and electronic resources as well as social networking technologies as tools to help the community, including children, identify risks and develop climate change adaptation strategies.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

46. Become familiar with the basic terminology and core concepts of climate change adaptation planning.
47. Identify the most likely impacts of local climatic hazards.
48. Articulating what good climate resilient development actually look like.
49. Compare local problems with problems elsewhere and to gain adaptation ideas from this comparison.

50. Comprehend the opportunities for planners and the social, economic and ecological risks of climate change.
51. Understand historical community reactions to and coping strategies for climatic hazards.
52. Contribute to the debate on global environmental change and societal adaptation strategies; to become an informed citizen and decision maker.
53. Demonstrate capacities for self-reflection and self-evaluation as integral aspects of the adaptive learning cycle.
54. Questioning business as usual can threaten our ideals, values, beliefs, business strategies and technical understanding and is not necessarily what everyone wants to hear.
55. Draw on active teaching and learning approaches to empower learner, young people and civic engagement.
56. Anticipate possible future environmental change and identify possible development consequences.
57. Appreciate the importance and practical characteristics of adaptive approaches.
58. Demonstrate knowledge and understanding of relationship between poverty, environment, climate change, economics and social issues.
59. Relate climate change and sustainability policy to a range of curricular areas in formal, non formal and informal education.

- **Course Resources**

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

- Gender and Climate Change Adaptation: Tools for Community-level Action in Nigeria, http://africanclimate.net/en/node/8979
- Climate Change: Key Concepts. **http://www.careclimatechange.org/tk/cba/en/cba_** basics/key_concepts.html
- The Intergovernmental Panel on Climate Change (IPCC) is a body set up to provide scientific, technical and socio-economic information in a policy-relevant but policy neutral way to decision makers.
- IPCC, 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.
- Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.*
- Task Force on Climate Change, Vulnerable Communities and Adaptation (IUCN, SEI and IISD), 2003. Livelihoods and Climate Change. Combining Disaster Risk Reduction, Natural Resource Management and Climate Change adaptation in a new approach to the reduction of vulnerability and poverty. International Institute for Sustainable Development, Canada.
- World Bank 2009. Convenient Solutions to an Inconvenient Truth: Ecosystem-based Approaches to Climate Change. Environment Department, World Bank.
- Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.*
- Adapted from: UNISDR, 2009. Terminology: Basic terms of disaster risk reduction and IISD et al, 2007. Community-based Risk Screening – Adaptation and Livelihoods (CRiSTAL) User's Manual, Version 3.0.
- UNISDR, 2009. Terminology: Basic terms of disaster risk reduction. Department for International Development, UK (DFID). 2001. *Sustainable Livelihoods Guidance Sheet*. Available at **http://www.nssd.net/pdf/ sectiont.pdf**.
- Scoones, Ian (2005): The Sustainable Rural Livelihoods: A Framework for Analysis. Institute for Development Studies, University of Sussex. England. **http://www.sarpn.org.za/www.careclimatechange.org/files/adaptation/ d0001493/P1833-Sustainable-rural-livelihoods_IDS-paper72.pdf**.
- IPCC, 2007: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.

- NASA - What's the Difference Between Weather and Climate? http://www. nasa.gov/mission_ pages/noaan/climate/climate_weather.html#. VAv8Mfl_vdM February 1, 2005
- Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 http://ezinearticles.com/?How-to-Promote-Environmental-Awareness&id=7141986
- *Livelihoods and Climate Change* ***http://www.iisd.org/ecp/es/resilience/*** *climate.asp*
- Livelihoods and Climate Change Project Snapshot (PDF - 438 kb), http://www.iisd.org/ecp/es/resilience/climate.asp
- Livelihoods and Climate Change: Combining disaster risk reduction, natural resource management and climate change adaptation in a new approach to the reduction of vulnerability and poverty (PDF - 1.6 mb), http://www.iisd.org/ecp/es/resilience/climate.asp
- Steve Vanderheiden Climate Change, Fairness, and Equity in *Atmospheric Justice* Published in print June 2008|ISBN: 9780195334609 Published online May 2008 | e-ISBN: 9780199868759 | DOI: http://dx.doi .org/10.1093/acprof:oso/9780195334609.003.0002 http://oxfordindex.o up.com/ view/10.1093/ acprof:oso/9780195334609. 003.0002
- Carter, T.R. *et al*. (2001). "Developing and Applying Scenarios. In: Climate Change 2001: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change [J.J. McCarthy *et al.* Eds.]". Cambridge University Press, Cambridge, U.K., and New York, N.Y., U.S.A. Retrieved 2010-01-10.
- "Using the Clean Air Act to Sharply Reduce Carbon Pollution from Existing Power Plants". Natural Resources Defense Counsel. Retrieved October 9, 2013.
- Morita *et al.*, "Chapter 2, Greenhouse Gas Emission Mitigation Scenarios and Implications", Sec. 2.5.1.1 IPCC Emissions Scenarios and the SRES Process, in IPCC TAR WG3 2001.
- Karl, TR, *et al*, ed. (2009), "Global climate change", *Global Climate Change Impacts in the United States*, New York, NY, USA: Cambridge University Press, p. 22, ISBN 978-0-521-14407-0
- Rogner, H.-H., *et al.*, "Introduction", Sec 1.3.2 Future outlook, in IPCC AR4 WG3 2007
- Section 4.4.1, Carbon dioxide emissions from energy supply by 2030, in IPCC AR4 WG3 2007

- IPCC AR4 WG3 (2007), Metz, B.; Davidson, O.R.; Bosch, P.R.; Dave, R.; and Meyer, L.A., ed., *Climate Change 2007: Mitigation of Climate Change*, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, ISBN 978-0-521-88011-4(pb: 978-0-521-70598-1).

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave

early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Environmental awareness
3		Weather and climate
4		Climate change and livelihoods
5		Climate change and livelihoods (man, plant, animals)
6		Gender-sensitive response to climate change
7		Male/Female: awareness of climate change consequences
8		Male/Female: roles to alleviate climate change consequences
9		Climate change communication (Concepts)

10		Climate change communication (tools: design)
11		Climate change communication (tools: implementation/analysis)
12		Fairness and climate change justice
13-15		Future climate change scenarios

Course Modules

Course	Scientifc Culture
Module 1	**Climate Change : Environmental Impacts**
Key Concepts	Climate Change, Environment
Overview	The term environment may be vague for many students, Some of them my be concerned with the physical environment around them. They might ignore my cultural components of environment which are responsible for shaping mans attitudes, and in turn, influence our behaviour. Such behaviour might aggregate or alleviate the environmental challenges. Mans behaviour may be affected by climate change. So, his reaction toward the environment is almost disastrous!! Issues addressed in this module include: definition of environment, components of environment: physical and cultural; basic differences between weather and climate; and impacts of local climatic hazards.
Aim	The aim of this module is to turn students able to discourse on basic concepts related to environment and the impact of climate change.
Learning Outcomes	At the end of this module learners will be able to: 4. Become familiar with the basic terminology and core concepts of climate change adaptation planning. 5. Identify the most likely impacts of local climatic hazards. 6. Articulating what good climate resilient development actually look like.
Units	Unit 1.1: Environment: Physical and Cultural Unit 1.2: Man VS Environment Unit 1.3: Weather and Climate
Readings	• Climate Change: Key Concepts. **http://www.careclimatechange.org/tk/cba/en/cba_**basics/key_concepts.html • The Intergovernmental Panel on Climate Change (IPCC) is a body set up to

	provide scientific, technical and socio-economic information in a policy-relevant but policy neutral way to decision makers. • IPCC, 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp. • Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.* • NASA - What's the Difference Between Weather and Climate? http://www. nasa.gov/mission_ pages/noaan/climate/climate_weather.html#. VAv8Mfl_vdM February 1, 2005 • Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness&id=7141986**

Activity	**Overview** Assignment 1.1: Reflecting Upon environmental issues 1. To what extent is responsible for environmental problems? (3-4 paragraphs) 2. What can we do to alleviate environmental problems? 3. draw a table of comparison to show the main differences between climate and weather. Assignment 1.2: Investigate local environmental problems to: - Make a list of most serious environmental problems - Interview a sample of citizens to identify their awareness of such problems. Access and explore the following report to identify and summarize its main ideas with regard the management of the environmental impacts of Climate Change: World Bank 2009. Convenient Solutions to an Inconvenient Truth: Ecosystem-based Approaches to Climate Change. Environment Department, World Bank.
Module 2	Climate Change and Livelihoods: Problems and Solutions
Key Concepts	Climate change , livelihoods (man, plant, animals)

Overview	The world is highly susceptible to a number of natural hazards droughts including, floods and hurricanes. Increasing in frequency and ferocity as a result of changing climate systems, these disasters are placing increased stress on inhabitants and severely impairing economic growth as they batter climate vulnerable sectors like tourism and agriculture upon which the region is financially reliant.In order to avoid risks and damage and to strengthen human resilience to natural disasters, governments need to be prepared. However, in developing countries, the ability of governments to help is often very limited. The impacts of loss and damage associated with natural disasters can set back development by increasing the incidence and severity of poverty. Poverty and vulnerability are fundamentally intertwined: the poor have fewer resources to cope with climate risk and thus their resource base is further diminished with every extreme weather event, deepening their poverty. This module is intended to raise the students awareness towards local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas for the management of such problems.
Aim	The overriding aim of this module is to identify local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas from this comparison.
Learning Outcomes	At the end of this module learners will be able to compare local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas from this comparison.
Units	Unit 2.1: Climate change and livelihoods Unit 2.2: Climate change and livelihoods (man, plant, animals)
Readings	• Task Force on Climate Change, Vulnerable Communities and Adaptation (IUCN, SEI and IISD), 2003. Livelihoods and Climate Change. Combining Disaster Risk Reduction, Natural Resource Management and Climate Change adaptation in a new approach to the reduction of vulnerability and poverty. International Institute for Sustainable Development, Canada.

	• Scoones, Ian (2005): The Sustainable Rural Livelihoods: A Framework for Analysis. Institute for Development Studies, University of Sussex. England. **http://www.sarpn.org.za/www.careclimatechange.org/files/adaptation/d0001493/P1833-Sustainable-rural-livelihoods_IDS-paper72.pdf**. • *Livelihoods and Climate Change* ***http://www.iisd.org/ecp/es/resilience/*** *climate.asp* • Livelihoods and Climate Change Project Snapshot (PDF - 438 kb), http://www.iisd.org/ecp/es/resilience/climate.asp • Livelihoods and Climate Change: Combining disaster risk reduction, natural resource management and climate change adaptation in a new approach to the reduction of vulnerability and poverty (PDF - 1.6 mb), http://www.iisd.org/ecp/es/resilience/climate.asp
Activity	**Overview**
	Design poster showing local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas for the management of such problems.
Module 3	**Gender-Sensitive Response to Climate Change**
Key Concepts	Gender-Sensitive
Overview	A gender-sensitive response does not mean having a set of disaggregated data showing that climate change has differential impacts on women and men. In fact, it is obvious. So more than that, it requires an understanding of the nature of existing inequalities between women and men, their consequences, and then coming up with strategies to nullify them. However, due to their social status men may have greater access to vital information on climate change mitigation or adaptation strategies, or women are too busy with caring and other domestic responsibilities so they lack this information. Therefore, lack of information and lack of opportunity to voice their concerns about adaptation and mitigation strategies could jeopardize their safety when climate change events strike.

	To counter this situation, strategies need to be planned so that women receive as much information on climatic events and conditions as men do. Women are also more likely than men to be absent from decision-making, right from home, to community, to national, to international levels for two reasons. One, their opinion is not given importance and two, they don't have time or confidence or opportunity to share. Therefore, whatever the reasons are they are simply marginalized; and the same is true for elderly and children. The net result is that they remain more vulnerable than men. Thus, if effective adaptation strategies have to be chalked out for them they must be drawn out to participate in the climate change discussions which in turn, means challenging the traditional assumptions about their capabilities and redefining their gender equation. For centuries, women have passed on their skills in water management, forest management and the management of biodiversity, among others. Through these experiences, women have acquired valuable knowledge that will allow them to contribute positively to the identification of appropriate adaptation and mitigation techniques, if only they are given the opportunity. The present module is concerned with: Male/Female awareness of climate change consequences; as well as their role in the management of climate change consequences.
Aim	This module encourages the students to the debate on global environmental change and societal adaptation
Learning Outcomes	At the end of this module learners will be able to: • Contribute to the debate on global environmental change and societal adaptation strategies; to become an informed citizen and decision maker. • Demonstrate capacities for self-reflection and self-evaluation as integral aspects of the adaptive learning cycle.
Units	Unit 3.1: Gender-sensitive response to climate change

	Unit 3.2: Male/Female: awareness of climate change consequences Unit 3.3: Male/Female: how to alleviate climate change consequences
Readings	• Gender and Climate Change Adaptation: Tools for Community-level Action in Nigeria, http://africanclimate.net/en/node/8979 • Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.* • IPCC, 2007: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.
Activity	**Overview**
	Assignment 1: Propose a strategy to: 3- Raise the awareness of both Male and Female citizen towards the climate change consequences in your local environment 4- how to involve both Male and Female citizen in the management of climate change consequences in your local environment
Module 4	**Climate Change Communication**
Key Concepts	social, economic and ecological risks of climate change; civic engagement

Overview	The rapid development of multimedia and hypermedia technologies has provided new avenues for merging images, sound, movies and animation together with texts. These can serve as effective tools for communicating information and data related to climate change concepts, causes and consequences. Climate change is the result of human actions and choices. Limiting climate change – and protecting people and ecosystems to the degree possible from unavoidable changes in the climate – will require significant public engagement in the issue so that difficult decisions can be made by members of the public and policy makers. So, the need emerges for unbiased social science research that will facilitate such public engagement. In other words, students should be trained on how to use social science research methods – experiments, surveys, in-depth interviews and other methods – to find ways of effectively engaging the public and policy makers in the problem, and in considering and enacting solutions. Social science research has played important roles in many social change campaigns over the past several decades, including reducing smoking and littering, and increasing seat belt use and recycling. So, they can conduct unbiased public engagement research - and help government agencies, non-profit organizations, and companies apply the results of this research - so that collectively, we can stabilize our planet's life sustaining climate.
Aim	The overriding aim of this module is encourage the students explore and use appropriate tools to communicate social, economic and ecological risks of climate change.
Learning Outcomes	At the end of this module learners will be able to: - Comprehend the opportunities for planners and the social, economic and ecological risks of climate change. - Understand historical community reactions to and coping strategies for climatic hazards. - Questioning business as usual can threaten our ideals, values, beliefs,

	business strategies and technical understanding and is not necessarily what everyone wants to hear. - Draw on active teaching and learning approaches to empower learner, young people and civic engagement.
Units	Unit 3.1: Climate Change Communication (Concepts) Unit 3.2: Climate Change Communication (tools: design) Unit 3.3: Climate Change Communication (tools: implementation/analysis)
Readings	• Adapted from: UNISDR, 2009. Terminology: Basic terms of disaster risk reduction and IISD et al, 2007. Community-based Risk Screening – Adaptation and Livelihoods (CRiSTAL) User's Manual, Version 3.0. • UNISDR, 2009. Terminology: Basic terms of disaster risk reduction. Department for International Development, UK (DFID). 2001. *Sustainable Livelihoods Guidance Sheet*. Available at **http://www.nssd.net/pdf/sectiont.pdf**.
Activity	**Overview**
	Assignment: Students are invited to work in groups to: - Design appropriate tools to communicate social, economic and ecological risks of climate change. - Write a report on the obtained results of communicating social, economic and ecological risks of climate change. - Orally present the outcomes of the above report
Module 5	Climate Change: Justice and Future Scenarios
Key Concepts	climate change fairness, justice; future scenarios.
Overview	This module is about climate change scenarios. Socioeconomic scenarios are used by analysts to make projections of future greenhouse gas (GHG) emissions and to assess future vulnerability to climate change. Producing scenarios requires estimates of future population levels, economic activity, the structure of governance, social values, and patterns of

	technological change. Economic and energy modelling (such as via the World3 or the POLES models) can be used to analyse and quantify the effects. These scenarios can be thought of as stories of possible futures. They allow the description of factors that are difficult to quantify, such as governance, social structures, and institutions. However, researcher claim a considerable variety among scenarios, ranging from variants of sustainable development, to the collapse of social, economic, and environmental systems.
Aim	The overriding aim of this module is to equip students with the capacity to actualise issues such as fairness and climate change justice; future climate change scenarios.
Learning Outcomes	At the end of this module learners will be able to contribute to group discussion with regard: • possible future environmental change and identify possible development consequences. • the importance and practical characteristics of adaptive approaches. • The relationship between poverty, environment, climate change, economics and social issues. • climate change and sustainability policy and a range of curricular areas in formal, non formal and informal education.
Units	Unit 5.1: Fairness and climate change justice Unit 5.2: Future climate change scenarios
Readings	• Steve Vanderheiden Climate Change, Fairness, and Equity in *Atmospheric Justice* Published in print June 2008|ISBN: 9780195334609 Published online May 2008 | e-ISBN: 9780199868759 | DOI: http://dx.doi .org/10.1093/acprof:oso/9780195334609.003.0002 http://oxfordindex.oup.com/ view/10.1093/ acprof:oso/9780195334609. 003.0002 • Carter, T.R. *et al*. (2001). "Developing and Applying Scenarios. In: Climate Change 2001: Impacts, Adaptation and Vulnerability. Contribution of

	Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change [J.J. McCarthy *et al*. Eds.]". Cambridge University Press, Cambridge, U.K., and New York, N.Y., U.S.A. Retrieved 2010-01-10. • "Using the Clean Air Act to Sharply Reduce Carbon Pollution from Existing Power Plants". Natural Resources Defense Counsel. Retrieved October 9, 2013. • Morita *et al.*, "Chapter 2, Greenhouse Gas Emission Mitigation Scenarios and Implications", Sec. 2.5.1.1 IPCC Emissions Scenarios and the SRES Process, in IPCC TAR WG3 2001. • Karl, TR, *et al*, ed. (2009), "Global climate change", *Global Climate Change Impacts in the United States*, New York, NY, USA: Cambridge University Press, p. 22, ISBN 978-0-521-14407-0 • Rogner, H.-H., *et al.*, "Introduction", Sec 1.3.2 Future outlook, in IPCC AR4 WG3 2007 • Section 4.4.1, Carbon dioxide emissions from energy supply by 2030, in IPCC AR4 WG3 2007 • IPCC AR4 WG3 (2007), Metz, B.; Davidson, O.R.; Bosch, P.R.; Dave, R.; and Meyer, L.A., ed., *Climate Change 2007: Mitigation of Climate Change*, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, ISBN 978-0-521-88011-4(pb: 978-0-521-70598-1).
Activity	**Overview**

	In groups, students are required to: **5- Explore a variety of resources on** - possible future environmental change and identify possible development consequences. - the importance and practical characteristics of adaptive approaches. - the relationship between poverty, environment, climate change, economics and social issues. - climate change and sustainability policy and a range of curricular areas in formal, non formal and informal education**.** **6- Summarize key ideas on the above issues, to be orally reported.** **7- Discuss the data reported in step (2).** **8- Propose at least three Scenarios that can be applicable to the students local environment.**

Contamination of soil and its treatment

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
266. Environmental awareness 267. Strategic planning 268. Environmental awareness 269. Environmental management 270. Technology and innovation 271. Climate change adaptation 272. Risk assessment 273. Climate variability 274. Weather and climate 275. Climate change communication 276. Climate change and health 277. Strategic planning and climate change 278. Role of international institutions 279. Climate change: Science, impacts & scenarios 280. Future climate change	388. Adaptive learning and self-reflection; 389. Communicating 390. Contextualising 391. Critical, systemic and futures thinking 392. Debating 393. Discourse 394. Futures thinking 395. Leadership 396. Local knowledge 397. Motivate and manage change 398. Problem solving 399. Resolve ethical dilemmas 400. Team management	436. Accountability 437. Confident 438. Decisive 439. Democratic 440. Empathy 441. Environmental justice 442. Openness to novelty and change 443. Optimism 444. Organised 445. Respect and care for the community 446. Respect for diversity 447. Social responsibility 448. Human rights 449. Sense of urgency 450. Human wellbeing 451. Social responsibility 452. Perspective 453. Co-responsibility 454. Systematic 455. Focussed	15. Discuss the sources of domestic, agricultural and industrial wastes and pollutants. 16. Identify the problems arising at pollution sites. 17. Devise solutions to the soil pollution problems. 18. Design soil treatment and water treatment process systems, among environmental processes. 19. Anticipate possible future environmental change and identify possible development consequences. 20. Estimate health impact of changes in soil pollution 21. Identify the different types of soil pollutants.

scenarios			

Course Syllabus

Course Number:

Contamination of soil and its treatment

Port Said University, Faculty of Science, Department of,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of Science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Contamination of Soil and its treatment**

Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to raise the students' awareness of soil . The course concentrates on the techniques employed in the analysis of the physical, hydrological, chemical, and biological properties of soils as well as those processes which control the development of the soil. It introduces students to the fundamentals of soil pollution with a background on historical perspective on soil pollution and a commentary on current soil quality policies and standards. It does so through tackling the following aspects: 1) natural sources of soil pollution, 2) anthropogenic sources of soil pollution, 3) airborne particulate matter, 5) negative impacts, 6) global warming, 7) soil pollution act, 8) atmospheric stability, 9) thermal invasion, 10) modelling of soil pollution and control devices. That is they are asked to read and summarize articles on soil pollution and its treatment. They are invited to discuss impacts of soil pollution on environment at local, national and international scales.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of soil pollution; b) to raise awareness of the learners about effects of soil pollution on climate; c) help learners use traditional and electronic tools to identify the risks the different types of soil pollutants; and d) to identify risks of soil pollution.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

22. Discuss the sources of domestic, agricultural and industrial wastes and pollutants.
23. Identify the problems arising at pollution sites.
24. Devise solutions to the soil pollution problems.
25. Design soil treatment and water treatment process systems, among environmental processes.
26. Anticipate possible future environmental change and identify possible development consequences.

27. Estimate health impact of changes in soil pollution
28. Identify the different types of soil pollutants.

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		History of air pollution;
2		Current policies, standards and objectives;
3		Sources of air pollution;
4		Effects of major air pollutants;
5		Monitoring of emissions and air pollutants in ambient air;
6		Modelling and control of emission from road transport;
7		Modelling and control of emission from industrial sources;
8		Chemistry and dispersion of air pollution in atmosphere;
9		Air pollution modelling approaches;
10		Commercial air quality models (ADMS, USEPA models;
11		Indoor air pollution;
12		Personal exposure to air pollution

The environmental impact assessment for projects

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
281. Environmental awareness 282. Climate change communication 283. Fairness and climate change justice 284. Future climate change scenarios 285. Technology and innovation 286. Climate change implications for integrated	401. Adaptive learning and self-reflection; 402. Awareness and advocacy raising 403. Communicating 404. Contextualising 405. Critical, systemic and futures thinking 406. Debating 407. Discourse 408. Futures thinking 409. Integrated assessment	456. Accountability 457. Confident 458. Decisive 459. Democratic 460. Empathy 461. Environmental justice 462. Openness to novelty and change 463. Optimism 464. Organised 465. Respect and care	**1-** Identify methods and principles of environmental assessment of the impacts of activities and pollutants. 2-Explain the dispersion and ecological distribution of pollutants during discharge and after emission. 3- Discuss the basics of project formulation, relationships between organisms and their environment and managing human, air and soil resources. 4- Explore the influence of economic activities on surrounding environment. 5- Summarize a wide range of laboratory and held

coastal planning 287. Risk assessment 288. Climate variability 289. Strategic planning and climate change 290. Role of international institutions 291. Climate change: Science, impacts & scenarios	410. Leadership 411. Local knowledge 412. Motivate and manage change 413. Networked learning 414. Prioritising 415. Problem solving 416. Scenario analysis and planning 417. Team management	for the community 466. Respect for diversity 467. Social responsibility 468. Transparency 469. Sense of urgency 470. Human wellbeing 471. Human rights 472. Social responsibility 473. Perspective 474. Co-responsibility 475. Systematic 476. Focussed	methods directly applicable to the study of environmental problems.

Course Syllabus

Course Number:

The environmental impact assessment for projects

Port Said University, Faculty of science, Department of Environmental Sciences,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **The environmental impact assessment for projects**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to provide students with the key concepts about the methods and principles of environmental assessment of the impacts of activities and pollutants (predicting dispersion and ecological distribution of pollutants during discharge and after emission) with the introduction of the basics of project formulation, relationships between organisms and their environment and managing human, air and soil resources, A course which will familiarize students with a wide range of laboratory and held methods directly applicable to the study of environmental problems.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of methods and principles of environmental assessment of the impacts of activities and pollutants; b) to raise awareness of the learners about the need for predicting dispersion and ecological distribution of pollutants during discharge and after emission; c) and help learners to acquire the basics of project formulation, relationships between organisms and their environment and managing human, air and soil resources and d) give the basic understanding of a wide range of laboratory and held methods directly applicable to the study of environmental problems.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Identify methods and principles of environmental assessment of the impacts of activities and pollutants.

2-Explain the dispersion and ecological distribution of pollutants during discharge and after emission.

3- Discuss the basics of project formulation, relationships between organisms and their environment and managing human, air and soil resources.

4- Explore the influence of economic activities on surrounding environment.

5- Summarize a wide range of laboratory and held methods directly applicable to the study of environmental problems.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Methods and principles of environmental assessment the impacts of activities and pollutants;.
3		the basics of project formulation
4		Relationships between organisms and their environment and managing human, air and soil resources. .
6		The influence of economic activities on surrounding environment.

Water Pollution

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
292. Environmental awareness 293. Climate change communication 294. Fairness and climate change justice 295. Future climate change scenarios 296. Technology and innovation 297. Climate change implications for integrated coastal planning 298. Risk assessment 299. Climate variability 300. Climate change communication 301. Climate change and health 302. Strategic planning and	418. Adaptive learning and self-reflection; 419. Awareness and advocacy raising 420. Communicating 421. Contextualising 422. Critical, systemic and futures thinking 423. Debating 424. Discourse 425. Futures thinking 426. Integrated assessment 427. Leadership 428. Local knowledge 429. Motivate and manage change 430. Networked learning 431. Prioritising 432. Problem solving	477. Accountability 478. Confident 479. Decisive 480. Democratic 481. Empathy 482. Environmental justice 483. Openness to novelty and change 484. Optimism 485. Organised 486. Respect and care for the community 487. Respect for diversity 488. Social responsibility 489. Transparency 490. Sense of urgency 491. Human wellbeing	71. Discuss the sources of domestic, agricultural and industrial wastes and pollutants. 72. Identify the problems arising at pollution sites. 73. Devise solutions to the water pollution problem. 74. Design water treatment and wastewater treatment process systems, among environmental processes. 75. Apply the different steps of the monitoring cycle in rivers and lakes. 76. Anticipate possible future environmental change and identify possible development consequences. 77. Appreciate the positive impacts of utilizing renewable energy resources on the environment. 78. Apply common statistical techniques for water quality data evaluation. 79. Use the different tools and equipments of

climate change 303. Role of international institutions 304. Climate change: Science, impacts & scenarios 305. Future climate change scenarios	433. Resolve ethical dilemmas 434. Scenario analysis and planning 435. Team management	492. Human rights 493. Social responsibility 494. Perspective 495. Co-responsibility 496. Systematic 497. Focussed	renewable energy resources. 80. Apply concepts of water pollution processes in rivers and lakes.

Course Syllabus

Course Number:

Water Pollution

Port Said University, Faculty of Science, Department of Physics,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of Science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Water pollution**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to raise the students' awareness water. It introduces them to the benefits of using clean energy resources. It does so through tackling the following aspects: 1) natural sources of air pollution, 2) anthropogenic sources of air pollution, 3) airborne particulate matter, 4) size distribution of atmospheric aerosols, 5) negative impacts, 6) global warming, 7) air pollution act, 8) atmospheric stability, 9) thermal invasion, 10) modelling of air pollution and control devices. That is they are asked to read and summarize articles on renewable energy resources. They are invited to discuss impacts of energy resources on environment at local, national and international scales. In short, the course provides an appropriate chance for the students to get the minimum knowledge of the advantages and disadvantages of renewable energy resources.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of air pollution; b) to raise awareness of the learners about effects of air pollution on climate; c) help learners use traditional and electronic tools to identify the risks the different types of air pollutants; and d) to highlight

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

81. Discuss the sources of domestic, agricultural and industrial wastes and pollutants.
82. Identify the problems arising at pollution sites.
83. Devise solutions to the water pollution problem.
84. Design water treatment and wastewater treatment process systems, among environmental processes.
85. Apply the different steps of the monitoring cycle in rivers and lakes.

86. Anticipate possible future environmental change and identify possible development consequences.
87. Appreciate the positive impacts of utilizing renewable energy resources on the environment.
88. Apply common statistical techniques for water quality data evaluation.
89. Use the different tools and equipments of renewable energy resources .
90. Apply concepts of water pollution processes in rivers and lakes.

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Energy Resources and Supply.
3		Renewable energies and clean technologies.
4		Solar Energy, solar cells, solar thermal heating systems, and electricity generation.
5		Tidal and Hydro as renewable energy resources.
6		Renewable Energy Integration and Energy Efficiency in the Built Environment
7		Research Design Methods.

CLIMASP COURSE SYLLABUS

Course Syllabus

Course Code: UNC012

History of Engineering and Energy

Aswan University, Faculty of Energy Engineering,

Fall Semester, 2013-2014

Instructor Information

Instructor: Dr. Mohamed Shaaban

Office Location: Faculty of Energy Engineering

Telephone: Office – +20 3481234

Office Hours: Sunday 11.00 - 14.00, Wednesday 11.00 – 14.00

E-mail: mshaban68@yahoo.com

Website:

Course Identification

Course Coder: UNC012

Level: 000

Course Name: Engineering and Energy History

Course Location:	Faculty of Energy Engineering
Class Times:	Sunday 9.00 - 11.00
Prerequisites:	NA
Faculty Web Page:	http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

History was quite impracticable, not only because of the enormous compression that would be necessary, but because the plan of the original did not lend itself to such treatment. The story of technological development was at every epoch closely related to the historical background. This course aims at being as much a technological history as a history of technology, and in pursuing this course we believe ourselves to be following
an important modern trend.

Course Learning Objectives

Know the engineering history in different fields. Know the energy and different sources of it. Know different fields and different programs of engineering Know about the engineer jobs in different pogroms. Understand the engineering job ethics

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Demonstrate knowledge of role of engineering in development and establishment of civilization.
2- Demonstrate knowledge and understanding of engineering history in ancient time, middle ages and modern time.
3- Demonstrate knowledge of different engineering fields.
4- Demonstrate knowledge of different engineering programs.
5- Demonstrate knowledge and understanding of technology transfer, environmental, inventions and engineering ethics.
6- Understand the role of engineering in development and establishment of civilization.
7- Identify technology transfer, environmental & inventions and engineering ethics

8- Assess engineering history in ancient, middle and modern time.
9- Assess resources in engineering history
10- Deal with engineering history at various times
11- Analyze methods and tools used in engineering history and engineering ethics

Course Resources

1- Chaaban, M. A., "History of Engineering and technology", Elslam Press, 1998
2- Singer, C. Holmyard, E. J. and Hill, A. R., History of Technology, Oxford university press, London, 1975

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	22/9/2013	Role of engineering in development
2	29/7	Establishment of civilization.
3	6/10	Engineering history in ancient time and middle ages.

4	13/10	Engineering history in modern time.
5	20/10	Engineering fields.
6	27/10	Engineering programs.
7	3/11	Technology transfer,
8	10/11	Midyear exam
9	17/11	Inventions
10	24/11	Environmental,
11	1/12	Engineering ethics
12	8/12	Resources in engineering history
13	15/12	Methods and tools used in engineering history
14	22/12	Final Exam

Module 1	**Engineering Development and Civilization**
Key Concepts	Civilization, history
Overview	History was quite impracticable, not only because of the enormous compression that would be necessary, but because the plan of the original did not lend itself to such treatment. The story of technological development was at every epoch closely related to the historical background.
Aim	The overriding aim of this module is to equip students with the engineering history at different ages.
Learning Outcomes	At the end of this module learners will be able to: 1- Demonstrate knowledge of role of engineering in development and establishment of civilization.

	2- Demonstrate knowledge and understanding of engineering history in ancient time, middle ages and modern time.
Units	• Unit 1.1: Role of engineering in development • Unit 1.2: Establishment of civilization • Unit 1.3: Engineering history in ancient time and middle ages • Unit 1.4: Engineering history in modern time.
Readings	1- Chaaban, M. A., "History of Engineering and technology", Elslam Press, 1998
Activity	**Overview**
	Assignment : Using the WWW search for different civilization and its famous pictures. Assignment : Prepare a research proposal
Module 2	**Engineering Programs**
Key Concepts	Engineering Fields, Engineering programs
Overview	Because of the development of engineering, there are many fields are presented. Different engineering programs are described which leads to different jobs.
Aim	The overriding aim of this module is to equip students with the engineering fields, programs and jobs
Learning Outcomes	At the end of this module learners will be able to: 1- Know different fields and different programs of engineering 2- Know about the engineer jobs in different pogroms.
Units	• Unit 2.1: Engineering programs • Unit 2.2: Engineering fields • Unit 2.3: Engineering jobs
Readings	2- Singer, C. Holmyard, E. J. and Hill, A. R., History of Technology, Oxford

	university press, London, 1975
Activity	**Overview**
	Assignment : Using the WWW search for different programs, fields and jobs Assignment : Prepare a research proposal
Module 3	**Technology transfer**
Key Concepts	Technology, inventions
Overview	The aims at being as much a technological history as a history of technology transfer, and in pursuing this course we believe ourselves to be following an important modern trend.
Aim	The overriding aim of this module is to equip students with the how is the technology transferred during centuries and the greatest inventions.
Learning Outcomes	At the end of this module learners will be able to: 1- Identify technology transfer, 2- Know about the inventions.
Units	• Unit 3.1: Technology transfer, • Unit 3.2: Engineering fields • Unit 3.3: Inventions
Readings	2- Singer, C. Holmyard, E. J. and Hill, A. R., History of Technology, Oxford university press, London, 1975
Activity	**Overview**
	Assignment : Using the WWW search **Assignment : Prepare a research proposal**
Module 4	**Technology transfer**
Key Concepts	Technology, inventions

Overview	The aims at being as much a technological history as a history of technology transfer, and in pursuing this course we believe ourselves to be following an important modern trend.
Aim	The overriding aim of this module is to equip students with the how is the technology transferred during centuries and the greatest inventions.
Learning Outcomes	At the end of this module learners will be able to: 1- Identify technology transfer, 2- Know about the inventions.
Units	• Unit 4.1: Technology transfer, • Unit 4.2: Engineering fields • Unit 4.3: Inventions
Readings	2- Singer, C. Holmyard, E. J. and Hill, A. R., History of Technology, Oxford university press, London, 1975
Activity	**Overview** Assignment : Using the WWW search **Assignment : Prepare a research proposal**
Module 5	**Engineering ethics**
Key Concepts	Environment, ethics
Overview	There is a strong relation between technology and the environment and ethics.
Aim	The overriding aim of this module is to equip students with the relation between invention and ethics.
Learning Outcomes	At the end of this module learners will be able to: 1- Identify technology transfer, environmental & inventions and engineering ethics 2- Demonstrate knowledge and understanding of technology transfer, environmental, inventions and engineering ethics.

Units	• Unit 5.1: Environmental, • Unit 5.2: Engineering ethics • Unit 5.3: Methods and tools used in engineering history
Readings	2- Singer, C. Holmyard, E. J. and Hill, A. R., History of Technology, Oxford university press, London, 1975
Activity	**Overview**
	Assignment : Using the WWW search **Assignment : Prepare a research proposal**

CLIMASP COURSE SYLLABUS

Course Syllabus

Course Code: UNC321

Project Management

Aswan University, Faculty of Energy Engineering, Departments of Mechanical Power Station and High Voltage Networks,

Spring Semester, 2013-2014

Instructor Information

Instructor: Prof. Dr. Muntasser Dwidar

Location: Faculty of Energy Engineering
Telephone: Office – +20 3481234
Office Hours: Monday 11.00 - 14.00, Thursday 11.00 – 14.00
E-mail: dewidar5@hotmail.com
Website:

Course Identification

Course Coder: UNC321
Level: 300
Course Name: Project management
Course Location: Faculty of Energy Engineering
Class Times: Wednesday 10.00 - 12.00
Prerequisites: NA
Faculty Web Page: http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

The project management is a process. It is an activity of planning, organizing, motivating, and controlling resources. It uses the procedures and protocols to achieve specific goals. A project is designed to produce a product or service. The management requires the development of distinct technical skills and management strategies.

Course Learning Objectives

Know the definitions used in project management. The project life cycle, Project stages, Relationships and responsibilities of the different project parties, Execution phase responsibilities, Productivity, Quality management. - Human Influences of projects: Upgrading, Development, Economic factors, Social factors, Cultural factors, Aesthetic factors, Hygienic and psychological factors. Types of projects: Urban planning projects (residential projects, tourism projects, commercial projects, public buildings…etc.). Infrastructure projects

(electricity plants, water supply and sewage networks, road networks, railroad networks, reservoirs, dams…etc.). Different Industrial projects (textile factories, steel Industries, cement factories, carpet factories, ceramic factories, food factories, electrical appliances, car industries…etc.). Environmental impact of projects: Negative and positive impacts (direct and indirect). The assessment of projects- both nationally and internationally- in order to avoid the negative consequences of projects on the environment. The approved rates and criteria for the compatibility of projects with environmental topics.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Define the definitions used in project management.

2- Understand the project life cycle

3- Understand the project stages, relationships and responsibilities.

4- Analyze execution phase responsibilities, productivity, quality management.

5- Discuss the hhuman influences of projects: Upgrading,

6- Identify the types of projects.

7- Analyse the environmental impact of projects

8- Apply the approved rates and criteria for the compatibility of projects with environmental topics.

Course Resources

1- Gray, R. and Larson, K., Project Management: The Managerial Process, McGraw Hill, Irwin, New York, NY, 2002.

2- Harris, R. and McCaffer, D., Modern Construction Management, Black Well Science, London, U.K., 2002.

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	definitions used in project management
2	23/2	Relationships and responsibilities of the different project parties

3	2/3	The project life cycle and project stages
4	9/3	Execution phase responsibilities
5	16/3	Productivity
6	23/3	Quality management
7	30/3	Human Influences of projects
8	6/4	Midyear exam
9	27/4	Types of projects and urban planning projects
10	4/5	Infrastructure projects and Industrial projects
11	11/5	Environmental impact of projects
12	18/5	The assessment of projects
13	25/5	The approved rates and criteria for the compatibility of projects with environmental topics
14	1/6	Final Exam

Module 1	**Definitions**
Key Concepts	Project, Management
Overview	The project management is a process. It is an activity of planning, organizing, motivating, and controlling resources.
Aim	The overriding aim of this module is to equip students know the definitions used in project management
Learning Outcomes	1- Define the definitions used in project management. 2- Understand the project life cycle
Units	• Unit 1.1: definitions used in project management • Unit 1.2: Relationships and responsibilities of the different project parties • Unit 1.3: The project life cycle and project stages
Readings	1- Gray, R. and Larson, K., Project Management: The Managerial Process, McGraw Hill, Irwin, New York, NY, 2002.
Activity	**Overview**

	Assignment : Using the WWW search for different definitions Assignment : Prepare a research proposal
Module 2	**Productivity and Quality**
Key Concepts	Productivity, Quality
Overview	A project is designed to produce a product or service with quality management
Aim	The overriding aim of this module is to equip students with the project stages.
Learning Outcomes	At the end of this module learners will be able to: 1- Understand the project stages, relationships and responsibilities. 2- Analyze execution phase responsibilities, productivity, quality management.
Units	• Unit 2.1: Execution phase responsibilities • Unit 2.2: Productivity • Unit 2.3: Quality management
Readings	Harris, R. and McCaffer, D., Modern Construction Management, Black Well Science, London, U.K., 2002.
Activity	**Overview**
	Assignment : Using the WWW search Assignment : Prepare a research proposal
Module 3	**Human Influences of Projects**
Key Concepts	Human, Projects
Overview	Human influences of projects such as upgrading, development, economic

	factors, social factors, cultural factors, aesthetic factors, Hygienic and psychological factors are the aim.
Aim	The overriding aim of this module is to equip students with human influences of projects
Learning Outcomes	At the end of this module learners will be able to: 1- Discuss the hhuman influences of projects: Upgrading, 2- Identify the types of projects..
Units	• Unit 3.1: Types of projects and urban planning projects • Unit 3.2: Infrastructure projects and Industrial projects •
Readings	1- Gray, R. and Larson, K., Project Management: The Managerial Process, McGraw Hill, Irwin, New York, NY, 2002.
Activity	**Overview**
	Assignment : Using the WWW search **Assignment : Prepare a research proposal**
Module 4	**Assessment of Projects**
Key Concepts	Assessment, Environmental
Overview	Environmental impact of projects: Negative and positive impacts (direct and indirect). The aim is the assessment of projects- both nationally and internationally- in order to avoid the negative consequences of projects on the environment.
Aim	The overriding aim of this module is to equip students with assessment of projects on the environment
Learning Outcomes	At the end of this module learners will be able to: 1- Analyse the environmental impact of projects
Units	• Unit 4.1:: Environmental impact of projects

	• Unit 4.2 Assessment of projects
Readings	2- Harris, R. and McCaffer, D., Modern Construction Management, Black Well Science, London, U.K., 2002.
Activity	**Overview** Assignment : Using the WWW search for different inventions. **Assignment : Prepare a research proposal**
Module 5	**Compatibility of Projects**
Key Concepts	Compatibility, environmental
Overview	The approved rates and criteria for the compatibility of projects with environmental topics.
Aim	The overriding aim of this module is to equip students to apply the compatibility with the environmental topics
Learning Outcomes	At the end of this module learners will be able to: 1- Apply the approved rates and criteria for the compatibility of projects with environmental topics.
Units	• Unit 5.1: Criteria for the compatibility of projects
Readings	2- Harris, R. and McCaffer, D., Modern Construction Management, Black Well Science, London, U.K., 2002.
Activity	**Overview** Assignment : Using the WWW search for different inventions. **Assignment : Prepare a research proposal**

CLIMASP COURSE SYLLABUS

Course Syllabus

Course Code: PCR123

Fundamentals of Thermodynamic

Aswan University, Faculty of Energy Engineering, Departments of Mechanical Power Station and High Voltage Networks,

Spring Semester, 2013-2014

Instructor Information

Instructor: Dr. Waleed Abdel-Fadeel
Location: Faculty of Energy Engineering
Telephone: Office – +20 3481234
Office Hours: Tuesday 11.00 - 14.00, Wednesday 11.00 – 14.00
E-mail: wfadeel@yahoo.com
Website:

Course Identification

Course Coder: PCR123
Level: 100
Course Name: Thermodynamic Fundamentals

Course Location:	Faculty of Energy Engineering
Class Times:	Thursday 9.00 - 11.00
Prerequisites:	NA
Faculty Web Page:	http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

The subject of thermodynamics referred to as thermal science. It is of interest to students of all engineering branches, in fact to all mankind, as it deals with the most basic processes occurring in nature. The subject forms the basis for the study of a vast variety of devices such as refrigerators, air conditioners, automotive engines, aircrafts, locomotives, power plants, etc, the use of which is involved in the everyday life of almost every individual. Even the simple kitchen gadget of steam pressure cooker is designed on the basis of the principles of thermodynamics.

Course Learning Objectives

Demonstrate knowledge of basic thermodynamic concepts, ideal gases and pure substance, first low of thermodynamic on different systems. Apply the first law of thermodynamics on various engineering applications. Share ideas and work in a team in an efficient and effective manner under controlled supervision or independently.

Course Content Learning Outcomes

1- Define the concept of the energy.
2- Define the different basic concepts like properties, state, process, equilibrium, and cycles.
3- Identify the different between the ideal gases and the pure substance.
4- Understand the property relations relevant to engineering thermodynamics.
5- Understand how to deal with thermodynamic tables.
6- Identify the concept of energy and mass conservation.
7- Apply these concepts on different applications.
8- Analyse problems, conclude solutions and demonstrate creative thinking.
9- Work coherently and successfully as a part of a team in assignments.
10- Discuss results and defined his/her ideas.

Course Resources

1- Sonntag, R. E.; Borgnakke, C. and Van Wylen, G. J., Fundamentals of thermodynamics, John Wiley and Sons Inc., 1998.

2- Cengel, Y. A. and M. A., Thermodynamics: An Engineering Approach, WCB/McGraw Hill, 1998

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	Basic concepts and definitions
2	23/2	System and control volume, Property and state

3	2/3	Processes and cycles
4	9/3	Work definition, Definition of heat transfer
5	16/3	Ideal gases, State equation, Specific heat at constant pressure and volume
6	23/3	Pure substances and phase equilibrium, Tables of thermodynamic properties
7	30/3	First law of thermodynamics, Internal energy and enthalpy
8	6/4	Midyear exam
9	27/4	First law for closed cycle
10	4/5	Closed and open systems: Steady flow and uniform state uniform flow
11	11/5	Application of first law of thermodynamics (reciprocating compressors)
12	18/5	Second law of thermodynamics
13	25/5	Vapour and gas cycles
14	1/6	Final Exam

Module 1	Basic concepts and definitions
Key Concepts	Property, state, Processes, cycles
Overview	The subject of thermodynamics referred to as thermal science. It is of interest to students of all engineering branches, in fact to all mankind, as it deals with the most basic processes occurring in nature.
Aim	The overriding aim of this module is to equip students with the basic concepts.
Learning Outcomes	At the end of this module learners will be able to: 1- Define the concept of the energy 2- Define the different basic concepts like properties, state, process, equilibrium, and cycles.
Units	• Unit 1.1: System and control volume, • Unit 1.2: Property and state • Unit 1.3: Processes and cycles
Readings	1- Sonntag, R. E.; Borgnakke, C. and Van Wylen, G. J., Fundamentals of thermodynamics, John Wiley and Sons Inc., 1998.
Activity	**Overview** Assignment : Using the WWW search Assignment : Prepare a research proposal
Module 2	**Work and heat**
Key Concepts	Work, heat
Overview	The work and heat are a kind of energy.
Aim	The overriding aim of this module is to equip students with the meaning of

	heat and energy.
Learning Outcomes	At the end of this module learners will be able to: 1- Know the difference between heat and work 2- Identify the different between the ideal gases and the pure substance. 3- Understand the property relations relevant to engineering thermodynamics. 4- Understand how to deal with thermodynamic tables
Units	• Unit 2.1: definitions • Unit 2.2: Ideal gas • Unit 2.3: pure substances
Readings	2- Cengel, Y. A. and M. A., Thermodynamics: An Engineering Approach, WCB/McGraw Hill, 1998
Activity	**Overview**
	Assignment : Using the WWW search Assignment : Prepare a research proposal
Module 3	**First law of thermodynamics**
Key Concepts	First law of thermodynamics
Overview	Apply the first law of thermodynamics on various engineering applications
Aim	The overriding aim of this module is to equip students with applications of the first law of thermodynamics.
Learning Outcomes	At the end of this module learners will be able to: 1- Identify the concept of energy and mass conservation 2- Apply these concepts on different applications
Units	• Unit 3.1: Understand how to deal with thermodynamic tables. • Unit 3.2: Closed cycle and Open cycle • Unit 3.3: Applications

Readings	1- Sonntag, R. E.; Borgnakke, C. and Van Wylen, G. J., Fundamentals of thermodynamics, John Wiley and Sons Inc., 1998.
Activity	**Overview** Assignment : Using the WWW search **Assignment : Prepare a research proposal**
Module 4	**Second law of thermodynamics**
Key Concepts	Second law of thermodynamics
Overview	The meaning of entropy and losses
Aim	The overriding aim of this module is to equip students with the meaning of entropy and kind of losses
Learning Outcomes	At the end of this module learners will be able to: 1- Identify the second law of thermodynamics 2- Identify the entropy and losses
Units	• Unit 4.1: Second law of thermodynamics • Unit 4.2: Entropy
Readings	1- Sonntag, R. E.; Borgnakke, C. and Van Wylen, G. J., Fundamentals of thermodynamics, John Wiley and Sons Inc., 1998.
Activity	**Overview** Assignment : Using the WWW search. **Assignment : Prepare a research proposal**
Module 5	**Vapour and gas cycles**
Key Concepts	Vapor, gas, cycles
Overview	Producing and consuming energy depends on cycles
Aim	The overriding aim of this module is to equip students with the different cycles.
Learning Outcomes	At the end of this module learners will be able to:

	1- Identify vapour cycles 2- Identify gas cycles
Units	• Unit 5.1: Vapour cycles • Unit 5.2: Gas cycles
Readings	2- Cengel, Y. A. and M. A., Thermodynamics: An Engineering Approach, WCB/McGraw Hill, 1998
Activity	**Overview**
	Assignment : Using the WWW search for **Assignment : Prepare a research proposal**

CLIMASP COURSE SYLLABUS

Course Syllabus

Course Code: ENN223

Energy Conversion and Utilization

Aswan University, Faculty of Energy Engineering, Departments of Mechanical Power Station and High Voltage Networks,

Spring Semester, 2013-2014

Instructor Information

Instructor:	Dr. Ezzat Gad
Location:	Faculty of Energy Engineering
Telephone:	Office – +20 3481234
Office Hours:	Monday 12.00 - 14.00, Wednesday 10.00 – 14.00
E-mail:	gadelseed@msn.com
Website:	

Course Identification

Course Coder:	ENN223
Level:	200
Course Name:	Energy conversion and utilization
Course Location:	Faculty of Energy Engineering
Class Times:	Monday 9.00 - 12.00
Prerequisites:	NA
Faculty Web Page:	http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

The purpose of this course is to critically examine the technology of energy systems that will be acceptable in a world faced with global warming, local pollution, and declining supplies of oil. The focus is on renewable energy sources (wind, solar, biomass), but other non-carbon emitting sources (nuclear) and reduced carbon sources (co-generative gas turbine plants, fuel cells) are also studied. Both the devices and the overall systems are analysed.

Course Learning Objectives

Introduction to principles, theories and processes of devices and systems that convert thermal, chemical, nuclear, and electromagnetic energy to electrical, mechanical and alternative chemical form. Energy conversion performance characteristics and sources of inefficiencies are explored for a variety of applications that include conventional fossil energy combustion based systems, nuclear, solar, wind, wave, biomass, thermoelectric, and geothermal energy systems.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Demonstrate knowledge of energy conversion principles

2- Understand of energy conversion principles

3- Understand the traction systems.

4- Recognize illumination and heating systems

5- Analyze illumination and heating systems.

6- Analyze essential industrial of wind energy. .

7- Analyze essential industrial of biomass and geothermal energy.

8- Analyze essential industrial of ocean energy.

9- Recognize the concepts and basics of climate control and sustainability.

Course Resources

1- Energy Systems Engineering, F.M. Vanek, L.D Albright, and Largus Angenent, Second Edition, McGraw-Hill, Inc., 2012.
2- Energy Conversion, Edited by D.Y. Goswami and F.Kreith, CRC Press, 2008. 2. G.N. Tiwari and R.K. Mishra, Advanced Renewable Energy Sources, RSC Publishing, 2012.

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	Introduction and scope of energy conversion. Outline of the course. Guidelines for how the material is approached. Motivations for studying future energy systems (e.g. pollution, climate change,

		energy security). Principles from engineering economics and systems engineering.
2	23/2	Overview of fossil fuel combustion and plants. Comparison of fuels (oil, natural gas and coal). Cycle analysis (Brayton, Rankine review; combined cycles, cogeneration).
3	2/3	Nuclear power: nuclear reaction physics, current reactor designs, Breeder reactors, nuclear fusion. Nuclear waste disposal.
4	9/3	Solar-thermal energy: solar radiation physics, solar radiation geometry.
5	16/3	Solar energy collection and conversion for heating systems. Concentrating solar thermal power. Stirling cycle
6	23/3	Photovoltaic technology. P-n junctions. Materials. Photovoltaic cells. Solar towers/heliostats.
7	30/3	Wind Energy: Wind energy formation and availability. Wind turbine design. Turbine capacity factor. Tip speed ratio, Betz limit. Blade element theory. Operating conditions (sitting, height, wind speed variation, sitting density). Land requirements. Economics of wind energy.
8	6/4	Midyear exam
9	27/4	Geothermal and Ocean Current Energy : Physics, resources and availabilities, energy conversion technologies.
10	4/5	Biomass and Waste to Energy : Potential of biomass energy. Thermal-chemical and bio-chemical conversion. Syngas and liquid fuel production. System efficiency and environmental impact.

11	11/5	Electro-chemical conversion: physics of conversion, types and systems of fuel cells
12	18/5	Thermoelectric conversion: physics of conversion. Materials and applications
13	25/5	Overview of Climate Control, CO2 Sequestration and Energy Sustainability.
14	1/6	Final Exam

Module 1	**scope of energy conversion**
Key Concepts	Energy, conversion
Overview	Introduction and scope of energy conversion. Outline of the course. Guidelines for how the material is approached. Motivations for studying future energy systems (e.g. pollution, climate change, energy security). Principles from engineering economics and systems engineering. Overview

	of fossil fuel combustion and plants. Comparison of fuels (oil, natural gas and coal). Cycle analysis (Brayton, Rankine review; combined cycles, cogeneration).
Aim	The overriding aim of this module is to equip students with the energy conversion and future energy system.
Learning Outcomes	At the end of this module learners will be able to: 1- Demonstrate knowledge of energy conversion principles 2- Understand of mechanical energy conversion principles
Units	• Unit 1.1: Introduction and scope of energy conversion. • Unit 1.2: Motivations for studying future energy systems • Unit 1.3: Principles from engineering economics and systems engineering. • Unit 1.4: fossil fuel combustion and plants • Unit 1.5: Cycle analysis.
Readings	1- Energy Systems Engineering, F.M. Vanek, L.D Albright, and Largus Angenent, Second Edition, McGraw-Hill, Inc., 2012.
Activity	**Overview**
	Assignment : Using the WWW search Assignment : Prepare a research proposal
Module 2	**Nuclear power**
Key Concepts	Nuclear, power
Overview	Nuclear reaction physics are widely used. The nuclear fusion is very dangerous. Nuclear waste disposal is a big problem.
Aim	The overriding aim of this module is to equip students with the nuclear reaction; the nuclear fusion and the nuclear waste disposal.
Learning Outcomes	At the end of this module learners will be able to: 1- Understand the reaction systems.

	2- Know about the nuclear fusion and the nuclear waste disposal
Units	• Unit 2.1: nuclear reaction physics • Unit 2.2: current reactor designs • Unit 2.3: nuclear fusion • Unit 2.4: Nuclear waste disposal
Readings	1- Energy Systems Engineering, F.M. Vanek, L.D Albright, and Largus Angenent, Second Edition, McGraw-Hill, Inc., 2012.
Activity	**Overview**
	Assignment : Using the WWW search Assignment : Prepare a research proposal
Module 3	**Solar energy**
Key Concepts	Solar, energy
Overview	Solar energy can be converted for heating systems. Solar energy is also can be converted directly into electricity by using Photovoltaic.
Aim	The overriding aim of this module is to equip students with the solar energy and its techniques for heating and electricity.
Learning Outcomes	At the end of this module learners will be able to: 1- Recognize illumination and heating systems 2- Know about the design of Photovoltaic.
Units	• Unit 3.1: solar radiation physics and geometry. • Unit 3.2: heating systems and Stirling cycle • Unit 3.3: Photovoltaic technology
Readings	1- Energy Systems Engineering, F.M. Vanek, L.D Albright, and Largus Angenent, Second Edition, McGraw-Hill, Inc., 2012.
Activity	**Overview**

	Assignment : Using the WWW search **Assignment : Prepare a research proposal**
Module 4	**Wind and other Energies**
Key Concepts	Wind, biomass, geothermal, ocean
Overview	Wind energy draws a main source of renewable energy. There are other sources such as biomass, geothermal and ocean energies.
Aim	The overriding aim of this module is to equip students with the technology of the wind, biomass, geothermal and ocean energies.
Learning Outcomes	At the end of this module learners will be able to: 1- Understand the Technology of wind energy. 2- Recognize the other renewable energy.
Units	• Unit 4.1: Wind Energy • Unit 4.2: Geothermal • Unit 4.3: Ocean Current Energy • Unit 4.4: Biomass and Waste to Energy
Readings	2- Energy Conversion, Edited by D.Y. Goswami and F.Kreith, CRC Press, 2008. 2. G.N. Tiwari and R.K. Mishra, Advanced Renewable Energy Sources, RSC Publishing, 2012.
Activity	**Overview**
	Assignment : Using the WWW search. **Assignment : Prepare a research proposal**
Module 5	**Climate Control**
Key Concepts	Climate, chemical, Control, Sustainability
Overview	The technology of energy systems must be examined that will be acceptable in a world faced with global warming, local pollution.
Aim	The overriding aim of this module is to equip students with the climate

	control, CO2 Sequestration and Energy Sustainability
Learning Outcomes	At the end of this module learners will be able to: 1- Recognize the concepts and basics of climate control and sustainability.
Units	• Unit 5.1: Electro-chemical conversion • Unit 5.2: Climate Control • Unit 5.3: CO2 Sequestration • Unit 5.4: Energy Sustainability
Readings	2- Energy Conversion, Edited by D.Y. Goswami and F.Kreith, CRC Press, 2008. 2. G.N. Tiwari and R.K. Mishra, Advanced Renewable Energy Sources, RSC Publishing, 2012.
Activity	**Overview**
	Assignment : Using the WWW search. **Assignment : Prepare a research proposal**

CLIMASP COURSE SYLLABUS

Course Syllabus

Course Code: ENP222

Heat Transfer

Aswan University, Faculty of Energy Engineering, Departments of High Voltage Networks, Spring Semester, 2013-2014

Instructor Information

Instructor:	Dr. Mahmuod Hasan
Location:	Faculty of Energy Engineering
Telephone:	Office – +20 3481234
Office Hours:	Thursday 12.00 - 14.00, sunday 10.00 – 14.00
E-mail:	aswan1500@yahoo.com
Website:	

Course Identification

Course Coder:	ENP222
Level:	200
Course Name:	Energy conversion and utilization
Course Location:	Faculty of Energy Engineering
Class Times:	Thursday 9.00 - 12.00
Prerequisites:	NA
Faculty Web Page:	http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

Heat transfer is a subject taught the basic concepts and the simple technical applications of heat transfer. More extensive knowledge of the subject is expected of graduate engineers. The engineer should be familiar with the fundamentals of heat conduction, convective heat transfer and radiative transfer, as well as having a basic knowledge of mass transfer. However, it is important that the student acquires a broad understanding of the fundamentals and methods. Then it is sufficient to deepen this knowledge with selected examples and thereby improve problem solving skills.

Course Learning Objectives

Demonstrate knowledge of heat transfer definitions and terminology, including heat flux, thermal conductivity, and heat transfer coefficients. Demonstrate knowledge of conduction and the equivalent resistance formula, convective and use of the overall heat transfer coefficient, radiant heat transfer, including black bodies, gray bodies and emissivity. Demonstrate knowledge of heat exchangers, including the different types and how they operate, application. Demonstrate knowledge of mass transfer definition and compare it with convenient heat transfer. Apply this knowledge on various engineering application. Share ideas and work in a team in an efficient and effective manner under controlled supervision or independently.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Explain the difference between turbulent and laminar flow regimes and how to determine which regime exists for a given flow.
2- Use correlations to calculate the convection heat transfer for flows over flat plates, cylinders, and sphere.
3- Determine the heat transfer coefficient and heat transfer rate using correlations for flow in cylindrical pipes.
4- Explain the difference between natural convection and forced convection.
5- Describe the relationship between radiation surface properties and radiation incident on a surface.
6- Determine the heat transfer from a grey surface given emissivity and the surface temperature.
7- Analyse the Heat transfer problems.
8- Conclude solutions and demonstrate creative thinking.
9- Deal with different used tables and charts.
10- Use appropriate fluid measurement lab. equipment.
11- Perform experiments in the lab within proper safety and ethical framework.
12- Write reports in accordance with the standard scientific guidelines.
13- Present reports, discuss results and defined his/her ideas.
14- Work coherently and successfully as a part of a team in assignments.

Course Resources

1- Bird, R. B.; Steward, W. E. and Lishtbast, E. N., Transport Phenomena, John Wiley and Sons Inc., 1960.

2- Incroperal David, P. Devitt, Introduction to Heat Transfer, John Wiley and Sons, 1990.

3- Holman, J. P., Heat Transfer, McGraw Hill Book Co., 1990.

4- Geankoplis, C. J., Transport Processes and unit operations, Prentice Hall Int., 1993.

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	Conduction equation and its application for steady state in simple and compound walls
2	23/2	Conduction equation and its application for steady state in simple and compound cylindrical and spherical surfaces

3	2/3	Study of the critical radius of insulation, Extended surfaces (fins) their efficiency charts.
4	9/3	Transient conduction
5	16/3	Introduction to convection heat transfer
6	23/3	Convection with internal flow
7	30/3	Convection with external flow
8	6/4	Midyear exam
9	27/4	Parameters affecting convection.
10	4/5	Relations for free convection and forced convection
11	11/5	Fundamentals of radiation heat transfer
12	18/5	Heat exchanger
13	25/5	Introduction to mass transfer
14	1/6	Final Exam

Module 1	**Conduction**
Key Concepts	Conduction, steady
Overview	The engineer should be familiar with the fundamentals of heat conduction. Demonstrate knowledge of heat transfer definitions and terminology, including heat flux, thermal conductivity,
Aim	The overriding aim of this module is to equip students with the fundamentals of heat conduction.
Learning Outcomes	At the end of this module learners will be able to: 1- Understand the steady state in simple and compound walls. 2- Study the conduction equation and its application
Units	• Unit 1.1: steady state in simple and compound walls • 1.2: steady state in simple and compound cylindrical and spherical

	surfaces • Unit 1.3: Extended surfaces (fins) • Unit 1.4: Transient conduction
Readings	1- Bird, R. B.; Steward, W. E. and Lishtbast, E. N., Transport Phenomena, John Wiley and Sons Inc., 1960.
Activity	**Overview**
	Assignment : Using the WWW search. Assignment : Prepare a research proposal
Module 2	**convection**
Key Concepts	Convection, internal flow, external flow, free, forced
Overview	The engineer should be familiar with the fundamentals of heat convection. Demonstrate knowledge of heat transfer coefficient and different types of convections.
Aim	The overriding aim of this module is to equip students with free and forced convection of the external and internal flows
Learning Outcomes	At the end of this module learners will be able to: 1- Explain the difference between turbulent and laminar flow regimes and how to determine which regime exists for a given flow. 2- Use correlations to calculate the convection heat transfer for flows over flat plates, cylinders, and sphere. 3- Explain the difference between natural convection and forced convection.
Units	• Unit 2.1: Introduction to convection heat transfer • Unit 2.2: Convection with internal flow • Unit 2.3: Convection with external flow • Unit 2.4 Parameters affecting convection.

	• Unit 2.5 free and forced convection
Readings	1- Bird, R. B.; Steward, W. E. and Lishtbast, E. N., Transport Phenomena, John Wiley and Sons Inc., 1960.
Activity	**Overview**
	Assignment : Using the WWW search Assignment : Prepare a research proposal
Module 3	**radiation**
Key Concepts	Radiation, black body, gray
Overview	The engineer should be familiar with the fundamentals of heat radiation. Demonstrate knowledge of different surfaces and black body
Aim	The overriding aim of this module is to equip students with the how is the Fundamentals of radiation heat transfer.
Learning Outcomes	At the end of this module learners will be able to: 1- Describe the relationship between radiation surface properties and radiation incident on a surface. 2- Determine the heat transfer from a grey surface given emissivity and the surface temperature. 3- Analyse the Heat transfer problems.
Units	• Unit 3.1: Fundamentals of radiation heat transfer
Readings	2- Incroperal David, P. Devitt, Introduction to Heat Transfer, John Wiley and Sons, 1990.
Activity	**Overview**
	Assignment : Using the WWW search **Assignment : Prepare a research proposal** **Perform experiments in the lab**

Module 4	**Heat exchanger**
Key Concepts	Heat exchanger
Overview	Heat exchanger is one of the most important applications of heat transfer.
Aim	The overriding aim of this module is to equip students with the how is the technology of heat exchangers.
Learning Outcomes	At the end of this module learners will be able to: 1- Identify the types of heat exchangers
Units	• Unit 4.1: Heat exchanger
Readings	3- Holman, J. P., Heat Transfer, McGraw Hill Book Co., 1990.
Activity	**Overview**
	Assignment : Using the WWW search. **Assignment : Prepare a research proposal** **Perform experiments in the lab**
Module 5	**mass transfer**
Key Concepts	mass transfer
Overview	There are many application in technology using the concept of mass transfer.
Aim	The overriding aim of this module is to equip students with the concept of mass transfer.
Learning Outcomes	At the end of this module learners will be able to: 1- Identify the concept of mass transfer and its technology.
Units	• Unit 5.1: mass transfer
Readings	4- Geankoplis, C. J., Transport Processes and unit operations, Prentice Hall Int., 1993.
Activity	**Overview**
	Assignment : Using the WWW search

	Assignment : Prepare a research proposal **Perform experiments in the lab**

CLIMASP COURSE SYLLABUS

Course Syllabus

Course Code: ENX31x

Renewable Energy Resources *(Elective Course)*

Aswan University, Faculty of Energy Engineering, Departments of High Voltage Networks,

Fall Semester, 2013-2014

Instructor Information

Instructor: Prof. Dr. Salama Abdel-Hady

Location: Faculty of Energy Engineering

Telephone: Office – +20 3481234

Office Hours: Monday 12.00 - 14.00, Thursday 10.00 – 14.00

E-mail: salama_abdelhady@hotmail.com

Website:

Course Identification

Course Coder:	ENX31x
Level:	300
Course Name:	Renewable Energy Resources (Engineering Elective Course 1)
Course Location:	Faculty of Energy Engineering
Class Times:	Monday 9.00 - 12.00
Prerequisites:	NA
Faculty Web Page:	http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

The origin and continuation of humankind is based on renewable energy such as solar and wind. The most basic processes supporting life on earth, such as photosynthesis and the rain cycle, are driven by solar and wind energy. From the very beginning of its history humankind realized that a good use of solar and wind energy is in humankind's benefit. Despite this, only recently, during the last 40 years, has solar and wind energy been har-nessed with specialized equipment and used as an alternative source of energy,

Course Learning Objectives

Identity different renewable energy, resources for power production such as wind, Solar, and non-conventional by hydro-power. Recognize natural sources of wind and solar ؟ energies in Egypt. Practice the operation and Design of Horizontal and Vertical Axis wind Turbines. Practice the Operation and Design of Solar flat plate collectors, concentrator systems, photovoltaic systems and other solar applications. Practice the operation of non-conventional hydro Power Systems Such as wave Energy and Tidal Energy. Recognize other renewable energy technologies such as Biomass, Ocean Thermal Energy …etc.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Define the renewable energy
2- Study the causes and the power of wind energy
3- Study of measuring equipment for wind speed and direction.

3- Analysis of wind energy data: Energy and frequency curves.
4- Analysis wind turbine theory and aerofoil theory.
5- Study of forces acting on the wind turbine and study the turbine performance.
6- Study of solar thermal energy: Its intensity in outer space and the calculation of the solar intensity on earth.
7- Study of solar angles, Shades and the equation of time.
8- Study of the solar collector and its components.

Course Resources

1- Duffie and Beckman, Solar Engineering of Thermal Processes, John Wiley, 1980.

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	22/9/2013	Introduction to renewable energy
2	29/7	Causes and the power of wind energy

3	6/10	Measuring equipment for wind speed and direction
4	13/10	Wind energy and frequency curves
5	20/10	Aerofoil theory.
6	27/10	Wind turbine theory
7	3/11	Forces acting on the wind turbine and study the turbine performance
8	10/11	Midyear exam
9	17/11	Introduction to solar thermal energy
10	24/11	Intensity in outer space and the calculation of the solar intensity on earth
11	1/12	Solar angles, Shades and the equation of time.
12	8/12	Components of solar collector
13	15/12	Design of solar collector
14	22/12	Final Exam

Module 1	**Introduction to renewable energy**
Key Concepts	Renewable, energy
Overview	The origin and continuation of humankind is based on renewable energy such as solar and wind. The most basic processes supporting life on earth, such as photosynthesis and the rain cycle, are driven by solar and wind energy. From the very beginning of its history humankind realized that a good use of solar and wind energy is in humankind's benefit. Despite this, only recently, during the last 40 years, has solar and wind energy been harnessed with specialized equipment and used as an alternative source of energy.
Aim	The overriding aim of this module is to equip students with the main sources of renewable energy.
Learning Outcomes	At the end of this module learners will be able to: 1- Define the renewable energy
Units	• Unit 1.1: Introduction to renewable energy
Readings	1- Duffie and Beckman, Solar Engineering of Thermal Processes, John Wiley, 1980.
Activity	**Overview** Assignment : Using the WWW search Assignment : Prepare a research proposal
Module 2	**Wind energy**

Key Concepts	Wind, energy
Overview	The power produces from the wind turbines is the most important sources of te renewable energy.
Aim	The overriding aim of this module is to equip students with the technology of wind turbines.
Learning Outcomes	At the end of this module learners will be able to: 1- Study the causes and the power of wind energy 2- Study of measuring equipment for wind speed and direction. 3- Analysis of wind energy data: Energy and frequency curves. 4- Analysis wind turbine theory and aerofoil theory. 5- Study of forces acting on the wind turbine and study the turbine performance.
Units	• Unit 2.1: Causes and the power of wind energy • Unit 2.2: Measuring equipment for wind speed • Unit 2.3: frequency curves • Unit 2.4: Aerofoil theory. • Unit 2.5: Wind turbine theory • Forces and performances of wind turbine
Readings	1- Duffie and Beckman, Solar Engineering of Thermal Processes, John Wiley, 1980.
Activity	**Overview**
	Assignment : Using the WWW search Assignment : Prepare a research proposal
Module 3	**solar thermal energy**
Key Concepts	Solar, thermal, energy
Overview	The power produces from the solar energy due to heat working fluid by

	using different method of technology.
Aim	The overriding aim of this module is to equip students with the technology of solar thermal energy.
Learning Outcomes	At the end of this module learners will be able to: 1- Study of solar thermal energy: Its intensity in outer space and the calculation of the solar intensity on earth. 2- Study of solar angles, Shades and the equation of time. 3- Study of the solar collector and its components.
Units	• Unit 3.1: solar intensity on earth • Unit 3.2: solar angles and the equation of time. • Unit 3.3: solar collectors
Readings	1- Duffie and Beckman, Solar Engineering of Thermal Processes, John Wiley, 1980.
Activity	**Overview**
	Assignment : Using the WWW search **Assignment : Prepare a research proposal**

CLIMASP COURSE SYLLABUS

Course Syllabus

Course Code: SEP32x

Pollution *(Elective Course)*

Aswan University, Faculty of Energy Engineering, Departments of Mechanical Power Station, Spring Semester, 2012-2013

Instructor Information

Instructor: Dr. Mohamed Fathi
Location: Faculty of Energy Engineering
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Office Hours: Tuesday 12.00 - 14.00, Wednesday 10.00 – 14.00
E-mail: mfsadik@yahoo.com
Website:

Course Identification

Course Coder: SEP32x
Level: 300
Course Name: Pollution (Special Elective Course 2)
Course Location: Faculty of Energy Engineering
Class Times: Tuesday 9.00 - 12.00

Prerequisites: NA

Faculty Web Page: http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

This course covers the practices and technologies that are applied to the prevention of air pollution, and to the cleaning and control of industrial air emissions. It provides a bridge for today's environmental manager by focusing on an integrated approach to managing air pollution problems within industrial operations.

Course Learning Objectives

Know the: definition of pollution - Sources of pollution - Types of pollution and their effect on lumen health. Methods of measurement - methods of pollutant reduction.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Define the environment.
2- Define the pollution.
3- Identify the sources of pollution.
4- Identify the types of pollution.
5- Discuss their effect on lumen health.
6- Identify the methods of measurement.
7- Apply the methods of pollutant reduction.

Course Resources

1- Nicholas P. Cheremisinoff, HANDBOOK OF AIR POLLUTION PREVENTION AND CONTROL, Elsevier Science (USA), 2002.
2- Boubel et al. (1994) Fundamentals of Air Pollution, 3rd Edition. Academic Press.

Course Website(s)
http://lwf.ncdc.noaa.gov/oa/climate/gases.html#cd
http://lwf.ncdc.noaa.gov/oa/climate/gases.html#m
http://lwf.ncdc.noaa.gov/oa/climate/gases.html#n2o
http://www.gsf.de/eurotrac
http://www.epa.gov/air/airtrends/reports.html
http://www.epa.gov/air/airtrends/aqtrnd03/
http://www.epa.gov/oar/caa/contents.html
http://www.epa.gov/air/basic.html
http://yosemite.epa.gov/R10/AIRPAGE.NSF

http://en.wikipedia.org/wiki/Air_pollution

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	Environment

2	23/2	Primary and secondary pollution
3	2/3	Sources of pollution
4	9/3	Types of pollution.
5	16/3	Air pollution regulation
6	23/3	Toxic pollutants
7	30/3	Radioactive pollutants
8	6/4	Midyear exam
9	27/4	Indoor pollutants
10	4/5	Ventilation and air quality control
11	11/5	Methods of measurement
12	18/5	Effect on lumen health
13	25/5	Pollutant reduction.
14	1/6	Final Exam

Module 1	**Environment**
Key Concepts	Environment, : Primary , secondary pollution
Overview	The concept of environment are widely used, therefore definition of it are most important.
Aim	The overriding aim of this module is to equip students with the meaning of environment and pollution.
Learning Outcomes	At the end of this module learners will be able to: 1- Define the environment.

	2- Define the pollution. 3- Identify the sources of pollution
Units	• Unit 1.1: Environment • Unit 1.2: Primary and secondary pollution • Unit 1.3: Sources of pollution
Readings	1- Nicholas P. Cheremisinoff, HANDBOOK OF AIR POLLUTION PREVENTION AND CONTROL, Elsevier Science (USA), 2002. http://lwf.ncdc.noaa.gov/oa/climate/gases.html#cd http://lwf.ncdc.noaa.gov/oa/climate/gases.html#m
Activity	**Overview**
	Assignment : Using the WWW search Assignment : Prepare a research proposal
Module 2	**Types of pollution.**
Key Concepts	Air pollution , Toxic, Radioactive, Indoor
Overview	There different types of pollution such as air, toxic, radioactive and indoor pollutants.
Aim	The overriding aim of this module is to equip students with the Types of pollution.
Learning Outcomes	At the end of this module learners will be able to: 1- Identify the types of pollution.
Units	• Unit 2.1: Air pollution regulation • Unit 2.2: Toxic pollutants • Unit 2.3: Radioactive pollutants • Unit 2.4: Indoor pollutants
Readings	1- Nicholas P. Cheremisinoff, HANDBOOK OF AIR POLLUTION PREVENTION AND CONTROL, Elsevier Science (USA), 2002.

	http://lwf.ncdc.noaa.gov/oa/climate/gases.html#n2o http://www.gsf.de/eurotrac
Activity	**Overview**
	Assignment : Using the WWW search Assignment : Prepare a research proposal
Module 3	**Methods of measurement**
Key Concepts	Measurement instrument, pollution
Overview	There are different methods to measure the different types of pollution.
Aim	The overriding aim of this module is to equip students with the how is the pollutions measured.
Learning Outcomes	At the end of this module learners will be able to: 1- Identify the methods of measurement 2- Discuss their effect on lumen health.
Units	• Unit 3.1: Methods of measurement • Unit 3.2: Effect on lumen health
Readings	1- Nicholas P. Cheremisinoff, HANDBOOK OF AIR POLLUTION PREVENTION AND CONTROL, Elsevier Science (USA), 2002. http://www.epa.gov/air/airtrends/reports.html http://www.epa.gov/air/airtrends/aqtrnd03/
Activity	**Overview**
	Assignment : Using the WWW search **Assignment : Prepare a research proposal**
Module 4	**Pollutant reduction.**
Key Concepts	Pollutant, reduction.

Overview	To reduce the pollutions, there are several methods must be followed.
Aim	The overriding aim of this module is to equip students with the method using to reduce the pollutions.
Learning Outcomes	At the end of this module learners will be able to: 1- Apply the methods of pollutant reduction.
Units	• Unit 4.1: Pollutant reduction.
Readings	2- Boubel et al. (1994) Fundamentals of Air Pollution, 3rd Edition. Academic Press. http://www.epa.gov/oar/caa/contents.html http://www.epa.gov/air/basic.html
Activity	**Overview**
	Assignment : Using the WWW search **Assignment : Prepare a research proposal**

Course Number:AQA121

University of Aswan, Faculty of Science, Department of Mathematics,
Summer Semester, 2013-2014

Instructor Information

Instructor: Dr. Adel A. El-Faheem
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Office Hours: Sunday 10.00 – 13.00
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Website:

Course Identification

Course Number: AQA121
Course Name: Statistical Biology and Experimental Design
Course Location: University Campus
Class Times: Sunday 10.00 – 13.00
Prerequisites: Introduction to Probability and Statistics
Faculty Web Page:

Course Description/Overview

This course is an introduction to statistics, experimental design and statistical analysis for addressing problems in biology. Statistics includes those techniques and tools used for the collection, display, and analysis of data for the purpose of making decisions or constructing mathematical models. Thus, we will explore the theoretical properties of statistical inference methods, and we will apply these methods to many sets of real data from the surrounding environment and climate change and its impact on fisheries statistics. The course begins with methods for collecting and summarizing data and analyzing and studying the measures of central tendency and measures of dispersion. The course then introduces probability theory as a background for understanding inferential statistics and Design of Experiments. Methods are next presented for drawing

inferences from research samples to populations from which the samples were drawn. The course covers basic statistical tests: analysis of variance, and Latin square - block design - the design of the cluster - the analysis of covariance.

Course Learning Objectives

The main goals of this course are practical:
1) to help you learn and practice basic experimental design, statistical methods, and tools for analyzing data,
2) to help you better critically interpret the primary biological literature. We work as much as possible with real biological problems and data sets related with environment and climate change,
3) to apply statistical methods learned to help solve interesting and realistic problems across a variety of fields.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. To learn basic techniques for collecting and summarizing data and analyzing and studying the measures of central tendency and measures of dispersion.
2. To appreciate the importance of how data are produced.
3. To understand the mathematical theory behind common methods of statistical inference, such as analysis of variance and the analysis of covariance .
4. To apply statistical methods learned to help solve interesting and realistic problems across a variety of fields.
5. To gain facility in analysis of variance, and Latin square - block design - the design of the cluster - the analysis of covariance.

Course Resources

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

1- Snedecor, G. W. and W. G. Cochran (1969). Statistical Methods 6th ed. Iowa State Univ., Press, Ames.

2- Steel, R. G. D. and J. H. Torrie (1980). Principles and procedures of Statistical: A biometrical Approach 2nd Ed. New Yourk U.S.A.

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments/attendance/participation	15 degrees
Midyear Exam	15 degrees
Applied Part	10 degrees
An oral exam	10 degrees
Final Exam	50 degrees
Total Points	100

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than 25% of classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 15% of the grade.

Dissability

N.A.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/3/2014	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	23/3	Methods for collecting and summarizing data
3	30/3	Analyzing and studying the measures of central tendency.
4	13/4	Measures of dispersion.
5	27/4	Introduces probability theory as a background for

		understanding inferential statistics
6	4/5	Understanding inferential statistics and testing the significant.
7	11/5	Introduction to Design of Experiments
8	18/5	Analysis of variance.
9	25/5	Latin square - block design - the design of the cluster -
10	1/6	Design sectors
11	8/6	Design Cluster
12	15/6	the analysis of covariance

Course	Statistical Biology and Experimental Design
Module 1	Collecting Data
Key Concepts	Types of Data, Information, Collecting Data.
Overview	Data Collection is an important aspect of any type of research study. Inaccurate data collection can impact the results of a study and ultimately lead to invalid results.
Aim	The aim of this module is to give students an idea about Data, and its types. Collecting the Data and put it in tables.
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss the different types of Data • Discuss how to put Data in Graphs and Tables
Units	Unit 1.1 Discrete Data

	Unit 1.2: Continuous Data Unit 1.3: Colleting Data Unit 1.4: Tabulation and Graphing the Data
Readings	http://www.stat.ncsu.edu/info/srms/survpamphlet.html http://www.worldbank.org/poverty/impact/methods/datacoll.
Activity	**Overview**
Module 2	Central Tendency
Key Concepts	Mean, Median, Mode
Overview	• A measure of central tendency is a measure that tells us where the middle of a bunch of data lies. • The three most common measures of central tendency are the mean, the median, and the mode.

Aim	The overriding aim of this module is to Enhances understandings of the Mean: Mean is the most common measure of central tendency. It is simply the sum of the numbers divided by the number of numbers in a set of data. This is also known as average. Median: Median is the number present in the middle when the numbers in a set of data are arranged in ascending or descending order. If the number of numbers in a data set is even, then the median is the mean of the two middle numbers. Mode: Mode is the value that occurs most frequently in a set of data.
Learning Outcomes	• At the end of this module learners will be able to: • Identify examples of Mean, Median, Mode • Understand calculating the central tendency measurements
Units	Unit 2.1: The arithmetic Mean. Unit 2.2: The Median. Unit 2.3: The Mode
Readings	http://www.icoachmath.com/math_dictionary/measures_of_central_tendency.html

	http://www.businessdictionary.com/definition/measures-of-central-tendency.html http://www.kenbenoit.net/courses/iqrm/IQRM_Week3_CentralTendency.pdf
Activity	**Overview**
	Find the mean, median, mode, and range for the following list of values of Data
Module 3	Measures of dispersion
Key Concepts	Rang, variance, standard deviation
Overview	In statistics, statistical dispersion (also called statistical variability or variation) is variability or spread in a variable or a probability distribution. Common examples of measures of statistical dispersion are the variance, standard deviation and interquartile range. Dispersion is contrasted with location or central tendency, and together they are the most used properties of distributions.
Aim	This module aims at measure of statistical dispersion for a real number that is zero if all the data are identical, and increases as the data becomes more diverse. It cannot be less than zero. Most measures of dispersion have the same scale as the quantity being measured. In other words, if the

	measurements have units, such as metres or seconds, the measure of dispersion has the same units
Learning Outcomes	At the end of this module learners will be able to: Identify examples of Mean, Median, Mode Understand calculating the central tendency measurements
Units	Unit 3.1 Standard deviation, Range Unit 3.2: Interquartile range Unit 3.3: Mean difference Median absolute deviation
Readings	http://www.regentsprep.org/Regents/math/algtrig/ATS1/Dispersion.htm http://web.uct.ac.za/depts/stats/BioInformaticsResources/Rayner/Rayner150/chapter6.pdf
Module 4	Probability
Key Concepts	Random Variables, Conditional Probability and Expectation

Overview	We use probability to describe uncertain events. When you accidentally drop a slice of bread, you don't know if it's going to fall with the buttered side facing upwards or downwards. When your favorite sports team plays a game, you don't know whether they will win or not. When the weatherman says that there is a 40% chance of rain tomorrow, you may or may not end up getting wet. Uncertainty presents itself to some degree in every event that occurs around us and in every decision that we make.
Aim	We will see in this Module all of these uncertainties can be described using the rules of probability theory and that we can make definite conclusions about uncertain processes. We'll use three examples of uncertain processes to help you understand the meanings of the different words used in probability theory: tossing a coin, rolling dice, and a soccer match.
Learning Outcomes	At the end of this module learners will be able to: • Demonstrate knowledge on the concept of probability • Plan, develop and assess uncertainties can be described using the rules of probability theory
Units	Unit 3.1: Basic Concepts Unit 3.2: Random Variables

	Unit 3.3: Expectation Unit 3.4: Conditional Probability and Expectation
Readings	http://m.everythingmaths.co.za/grade-10/10-probability/10-probability-01.cnxmlplus http://m.everythingmaths.co.za/grade-10/10-probability/10-probability-01.cnxmlplus
Activity	**Overview**
	Assignment : **Prepare a research proposal for Bayes' Theorem** What is Probability?
Module 5	**Inferential Statistics**
Key Concepts	Production processes, techniques
Overview	We have seen that descriptive statistics provide information about our immediate group of data. For example, we could calculate the mean and standard deviation of the exam marks for the 100

	students and this could provide valuable information about this group of 100 students. Any group of data like this, which includes all the data you are interested in, is called a **population**. A population can be small or large, as long as it includes all the data you are interested in. For example, if you were only interested in the exam marks of 100 students, the 100 students would represent your population. Descriptive statistics are applied to populations, and the properties of populations, like the mean or standard deviation, are called **parameters** as they represent the whole population (i.e., everybody you are interested in).
Aim	With inferential statistics, you are trying to reach conclusions that extend beyond the immediate data alone. For instance, we use inferential statistics to try to infer from the sample data what the population might think. Or, we use inferential statistics to make judgments of the probability that an observed difference between groups is a dependable one or one that might have happened by chance in this study. Thus, we use inferential statistics to make inferences from our data to more general conditions; we use descriptive statistics simply to describe what's going on in our data.
Learning Outcomes	At the end of this module learners will be able to: • Estimating the parameter for population. • Work with others in groups

	• Solving problems using statistical inference theory • Use inferential statistics to make inferences from our data to more general conditions
Units	Unit 5.1: Understanding inferential statistics and testing the significant. Unit 5.2: Introduction to Design of Experiments Unit 5.3: Analysis of variance, the analysis of covariance Unit 5.4: Latin square - block design - the design of the cluster
Readings	https://statistics.laerd.com/statistical-guides/descriptive-inferential-statistics.php http://www.mathcs.duq.edu/~packer/Courses/Psy624/Inferential.pdf
Activity	

Instructor Information

Instructor: Associate Prof. Dr. Ashraf Emam
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http://scholar.google.com/citations?user=pod-43UAAAAJ

Course Identification

Course Number: **GEO 434**
Course Name: Environmental Geology
Course Location: University Campus
Class Times: 2:00 – 3:00 pm, Wednesday
Faculty Web Page: http://sci.aswu.edu.eg

Course Description:

Environmental geology is a science which objectively studies geologic information and applies it to contemporary environmental problems such as pollution, waste management, resource extraction, natural hazards, and human health. An environmental geologist might evaluate the risk and damage potential from natural hazards such as floods, landslides, volcanoes, or earthquakes. The environmental changes on local to global scales can be placed into an earth systems science perspective through examining the evolution and structure of our planet's components, and how these components naturally interact. This course is designed to introduce students to the relationship between humans and our Earth. It focuses on environmental and geosciences subjects that facilitate greater awareness of the interactions between the different Earth's components. The course discusses the geologic processes that shape the surface of the Earth, and how these processes affect and are affected by human activity. Moreover, the relationships between the lithosphere, hydrosphere, and atmosphere will be discussed. Particular attentions are given to the subjects of soil, mineralogy,

biogeochemical cycles, climate change, and pollution by human activities. The scientific methods that allow studying, prediction, and mitigation of environmental problems will be discussed.

Course Learning Objectives:
The course introduces students to our natural environment and the human interactions and everyday problems with our environment and global community from a geological perspective. Topics to be covered will include; earth materials and structure, environmental hazards such as floods, volcanoes and earthquakes, pollution of the environment, waste disposal, natural resources, and energy sources and their exploitation. The overarching goals of this course are to:

- Provide the fundamental concepts of environmental geology, and the interactions between the Earth systems and human activities.
- Increase awareness of environmental issues and how they affect society.
- Raise awareness of the natural hazards associated with common geologic processes including volcanoes, earthquakes, tsunamis, and floods.
- Gain an understanding of the physical processes that operate in and on earth.
- Understand the interactions between humans and these geological processes.
- Introduce the environmental challenges such as climate change, the global water quality and supply, and the scale of these challenges
- Summarize the pollutants and harms that are created from exploitation of ores, minerals and energy resources.
- Process and interpret the environmental data to solve environmental problems.

Course Content Learning Outcomes
Upon successful completion of this course, students will be able to:

1. Discuss the fundamental concepts of environmental geology, the earth system and the different environmental cycles, and the interactions between the Earth systems and human activities.

2. Understand the geologic processes and associated natural hazards, the pollutants and harms, created from ore and energy resources exploitation.
3. Understand the interactions between humans and the geological processes.
4. Summarize the environmental challenges such as climate change, the global water quality and supply.
5. Process and interpret the environmental data and apply scientific methods to solve environmental problems.

Required Course Texts and Materials:
Reference textbook for this course are:
1) Principles of Environmental Geochemistry by G. Nelson Eby, Brooks/Cole, 2004; 2) Environmental Geology, 8th edition, by Edward A. Keller Prentice Hall, 2000.
3) The Geology of Egypt, by Said, R., Ed. (1990).
In addition, selected publications in the fields relevant to the topics will be reviews and discussed extensively.

Assignments and Grading Scheme

Grading System
0 to 150 (where 90 is the least pass mark)

Grading Policy

Assignments	20%
Exams	70%
Class attendance/participation	10%
Total Points	**100**

Course Schedule

Week	Date	Topics
1		Discussion of syllabus, assignments, and course requirements.
2		Environmental geology: Fundamental concepts and definitions.
3		Earth structure and systems.
4		Geologic cycle and processes
5		Soil formation, classification and profile
6		Mass wasting processes
7		Volcanism: tectonic setting and types
8		Volcanic hazards, volcanoes and climate
9		Earthquake process, magnitude and intensity
10		Hazards and effects of earthquakes
11		Hazards associated with Floods and torrents
12		Hazards associated with ore and energy resources exploitation.
13		Wastes management
14		The environmental challenges (climate change, the global water quality and supply).

Course	Environmental Geology
Module 1	**Introduction**
Key Concepts	Environmental geology: Fundamental concepts and definitions
Overview	Environmental geology is the use of geologic information to help us solve conflicts in land use, to minimize environmental degradation, and to maximize the beneficial results of using our natural and modified

	environments. This module discusses the basic concepts and principles of environmental geology, and defines the commonly used terms and issues. The module provides general introduction to Environmental Geology, environmental ethics, environmental Crisis and fundamental concepts of the environmental sciences
Aim	The overriding aim of this module is to turn students able to discourse on basic concepts and principles of environmental geology, definitions of commonly used terms and issues, and fundamental concepts that apply to all environmental sciences.
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss the different terms, concepts and principles of environmental geology. • Summarize the environmental ethics and crisis
Units	Unit 1.1: Introduction to Environmental Geology. Unit 1.2: Environmental Ethics. Unit 1.2: Environmental Crisis. Unit 1.4: Fundamental Concepts of the Environmental Sciences.
Readings	Environmental Geology, Lundgren, L. W., 1999 Environmental Geology, 8th edition, Keller E. A., 2000
Activity	What environmental geology means? Discuss the basic concepts of environmental geology? Write brief notes on environmental ethics and crisis?
Module 2	**Geologic cycles and processes**
Key Concepts	Plate tectonics, rock cycle, water cycle, surficial process
Overview	This module focuses on the geologic cycle including tectonic, hydrologic, rock, and biogeochemical sub-cycles that influence each other and may produce natural hazards and processes important to environmental geology such as landslides, earthquakes, volcanic activity, flooding,

	groundwater flow, and weather. Next, the module spotlights on the three rock families and their properties, such as a compressive strength and response to stress and strain that are essential to evaluating natural hazards.
Aim	The overriding aim of this module is to enhance student understandings about the geologic cycle, rock properties and surfacial process.
Learning Outcomes	At the end of this module students will be able to: • Identify and discuss the geologic sub-cycles • Understand the surficial processes that produce natural hazards.
Units	Unit 2.1: Geologic Cycle Unit 2.2: Hydrologic Cycle Unit 2.3: Biogeochemical Cycle Unit 2.4: Physical Properties of Rocks Unit 2.5: Surficial Processes
Readings	Environmental Geology, Lundgren, L. W., 1999 Environmental Geology, 8th edition, Keller E. A., 2000
Activity	Where do volcanoes and earthquakes occur? What is the percent of fresh water on earth? How much carbon dioxide enters the Earth's atmosphere each day? What is carbon dioxide's residence time in the atmosphere? Define the three types of stress? What are the physical earth processes might cause each, and what strain would result? What are the differences between elastic and plastic deformations?
Module 3	**Soils**
Key Concepts	Soil formation, soil profile, soil physical properties
Overview	The module focuses on soils--how they are formed and classified, their texture and structure, how liquids move through them, and their engineering properties. The module concludes the effects of land use activities on soil which results in erosion, pollution, and desertification.

Aim	The overriding aim of this module is to turn students able to understand the principle factor controlling soil formation, and to evaluate the physical properties of soils as engineering materials.
Learning Outcomes	At the end of this module students will be able to: • Reveal knowledge on the soil formation factors • Identify the different soil horizons and soil profile • Determinate the physical and engineering properties of soils
Units	Unit 3.1: Soil formation and classification Unit 3.2: Soil horizons and soil profile Unit 3.3: Physical properties of soils
Readings	Environmental Geology, 8th edition, Keller E. A., 2000
Activity	What are the main factors controlling soil formation? What are the criteria that used to make soil classification? Define the most common soil horizons and their characteristics? What are the physical parameters you use to evaluate soils for engineering purposes?
Module 4	**Slope Failure and Mass Wasting Processes**
Key Concepts	Slope Profiles, Slope Stability, Types of Mass Wasting, The Human Impact of Landslides, Subsidence
Overview	Slope failure, also referred to as mass wasting, is the down-slope movement of rock debris and soil in response to gravitational stresses. This module focuses on the types of mass wasting classified based on the type of down-slope movement. The types of movement, falls, slides, and flows are covered in this module. In addition, another type of ground failure and subsidence are covered.
Aim	The overriding aim of this module is to turn students able to discourse on major types of mass wasting and their causes.
Learning	At the end of this module learners will be able to:

Outcomes	• Identify the slope stability and types of down-slope movement. • Understand the different mass wasting processes. • Summarize the driving and resisting forces. • Discuss the effects of water and earth materials on slope failure.
Units	Unit 4.1: Slopes and slope profiles Unit 4.2: Mass wasting processes Unit 4.3: Types of down-slope movement Unit 4.4: Slope stability, driving and resisting forces Unit 4.5: Water and ground material effects on pattern of slope failure
Readings	Environmental Geology, 8th edition, Keller E. A., 2000
Activity	List the common mass wasting processes and types of slope failure? Write brief notes on slope stability, driving and resisting forces? Summarize effects of water and earth materials on slope failure pattern? What are the conditions causing the slope failure?
Module 5	**Volcanism and Earthquakes**
Key Concepts	Major Types of Volcanoes, Volcanic Hazards, Effects of Volcanoes, Earthquake Process, Magnitude and Intensity Earthquakes, Effects of Earthquakes.
Overview	Volcanoes differ greatly in style of eruption and associated hazards. Moreover, earthquakes are probably the most frightening naturally occurring hazard encountered. This module discusses the types of volcanoes and earthquake process, effects of volcanoes and earthquakes, and their associated hazards. It includes the following major topics: tectonic setting and types of volcanoes, volcanic hazards, predicting volcanic activity, volcanoes and climate, types of faults and earthquake process, detecting, locating and measuring earthquakes.
Aim	The overriding aim of this module is to turn students able to discourse on major types of volcanoes and earthquake process, their primary and secondary effects, and the associated hazards.

Learning Outcomes	At the end of this module learners will be able to: • Understand tectonic setting of volcanoes. • Identify the common types of volcanoes. • Summarize the effects and hazards of volcanoes. • Understand the earthquake process, their magnitude and intensity • Summarize the effects and hazards of earthquakes
Units	Unit 5.1: Volcanoes: tectonic setting and types. Unit 5.2: Volcanic hazards and predicting volcanic activity. Unit 5.3: Volcanoes and climate. Unit 5.4: Types of faults and earthquake process. Unit 5.5: Magnitude, intensity and effects of earthquakes
Readings	Environmental Geology, 8th edition, Keller E. A., 2000
Activity	What are the common types of volcanoes? List and briefly describe the primary and secondary environmental effects of volcanic eruptions? Discuss the relationship between the volcanic activity and climate? List and briefly describe the primary and secondary environmental effects of earthquakes?

Air Pollution

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
306. Environmental awareness 307. Strategic planning 308. Environmental awareness 309. Environmental management 310. Technology and innovation 311. Climate change adaptation 312. Risk assessment 313. Climate variability 314. Weather and climate 315. Climate change communication 316. Climate change and health 317. Strategic planning and climate change 318. Role of international institutions	436. Adaptive learning and self-reflection; 437. Communicating 438. Contextualising 439. Critical, systemic and futures thinking 440. Debating 441. Discourse 442. Futures thinking 443. Leadership 444. Local knowledge 445. Motivate and manage change 446. Problem solving 447. Resolve ethical dilemmas 448. Team management	498. Accountability 499. Confident 500. Decisive 501. Democratic 502. Empathy 503. Environmental justice 504. Openness to novelty and change 505. Optimism 506. Organised 507. Respect and care for the community 508. Respect for diversity 509. Social cohesion 510. Social responsibility 511. Transparency 512. Human rights 513. Sense of urgency 514. Human wellbeing	91. Discuss the effects of air pollution on vegetation, soils, fresh water, and buildings. 92. Identify the characteristics of air pollution, relevant regulations, and control technologies. 93. Identify the different types of air pollutants. 94. Anticipate possible future environmental change and identify possible development consequences. 95. Estimate air pollution concentrations as a function of emission, meteorology, topography and the built environment for a combination of road and industrial sources. 96. Disseminate emission and air quality results to a wider audience. 97. Estimate health impact of changes in air pollution

319. Climate change: Science, impacts & scenarios 320. Future climate change scenarios		515. Social responsibility 516. Perspective 517. Co-responsibility 518. Systematic 519. Focussed	

Course Syllabus

Course Number:

Air Pollution

Port Said University, Faculty of Science, Department of Physics,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of science Campus
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Air Pollution**
Course Location: University Campus
Class Times:
Prerequisites:

Faculty Web Page: www.sci.psu.edu.eg

Course Description/Overview

The present course is intended to raise the students' awareness. It introduces students to the fundamentals of air pollution with a background on historical perspective on air pollution and a commentary on current air quality policies and standards It focuses on understanding the atmospheric phenomena and the destruction of natural balance, including noise pollution, inevitably brought about by human activities, It provides an overview of the history of air pollution, air pollutants, effect of air pollution on climate, air quality management, and indoor air pollution. It does so through tackling the following aspects: 1) natural sources of air pollution; 2) anthropogenic sources of air pollution; 3) airborne particulate matter; 4) size distribution of atmospheric aerosols; 5) negative impacts; 6) global warming; 7) air pollution act; 8) atmospheric stability; 9) thermal invasion; 10) modelling of air pollution and control devices. That is they are asked to read and summarize articles on air pollution and its sources. They are invited to discuss effect of air pollution on climate at local, national and international scales. In short, the course provides an appropriate chance for the students to get the minimum knowledge of major air pollutants; their sources and their effects (environmental, economic and health) and how emissions are estimated from road traffic and industrial sources.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of air pollution; b) to raise awareness of the learners about effects of air pollution on climate; c) help learners use traditional and electronic tools to identify the risks the different types of air pollutants; and d) to highlight the importance of renewable energy resources as clean and safe resources to the environment.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

98. Discuss the effects of air pollution on vegetation, soils, fresh water, and buildings.
99. Identify the characteristics of air pollution, relevant regulations, and control technologies.
100. Identify the different types of air pollutants.
101. Anticipate possible future environmental change and identify possible development consequences.

102. Estimate air pollution concentrations as a function of emission, meteorology, topography and the built environment for a combination of road and industrial sources.
103. Disseminate emission and air quality results to a wider audience.
104. Estimate health impact of changes in air pollution

Required Course Texts and Materials

Hands-out prepared by the instructor for the

- Environmental pollution and control , Ann Arbor, 1982.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		History of air pollution;
2		Current policies, standards and objectives;
3		Sources of air pollution;
4		Effects of major air pollutants;
6		Monitoring of emissions and air pollutants in ambient air;
7		Modelling and control of emission from road transport;
8		Modelling and control of emission from industrial sources;
9		Chemistry and dispersion of air pollution in atmosphere;
10		Air pollution modelling approaches;
11		Commercial air quality models (ADMS, USEPA models;
12		Indoor air pollution;
13		Personal exposure to air pollution

Atmospheric Physics

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
321. Environmental awareness 322. Gender-sensitive response to climate change 323. Climate change communication 324. Fairness and climate change justice 325. Future climate change scenarios	449. Adaptive learning and self-reflection; 450. Awareness and advocacy raising 451. Communicating 452. Contextualising 453. Critical, systemic and futures thinking 454. Debating 455. Discourse 456. Futures thinking 457. Integrated assessment 458. Leadership 459. Local knowledge 460. Mapping gender impacts 461. Motivate and manage	520. Accountability 521. Confident 522. Decisive 523. Democratic 524. Empathy 525. Environmental justice 526. Gender-sensitive 527. Global mind-set/ consciousness 528. Interdependency 529. Needs vs. wants 530. Nonviolence & peace 531. Openness to novelty and change 532. Optimism 533. Organised	17. Describe the biosphere through the study of the natural state of ecosystems, the relationships between organisms and their environment and managing human and water resources. 18. Explain the relationships between organisms and their environment and managing human and water resources. 19. Question the relationships between Earth's atmosphere and the atmospheres of the other planets using fluid flow equations, chemical models, radiation balancing, and energy transfer processes in the atmosphere (as well as how these tie into other systems such as the oceans). 20. Anticipate possible future environmental changes and possible development consequences.

	change 462. Networked learning 463. Prioritising 464. Problem solving 465. Resolve ethical dilemmas 466. Scenario analysis and planning 467. Team management	534. Respect and care for the community 535. Respect for diversity 536. Social cohesion 537. Social responsibility 538. Stewardship 539. Tolerance 540. Transparency 541. Virtue	21. Understand scattering theory, wave propagation models, cloud physics, statistical mechanics and spatial statistics which are highly mathematical and related to physics 22. Demonstrate the knowledge and understanding of the links of atmospheric physics to meteorology and climatology. 23. Use the different tools and equipments to collect data needed for studying the atmosphere and atmospheric changes, 24. Anticipate the effect of atmosphere on climate change.

Course Syllabus

Course Number:

Atmospheric Physics

University of Port Said, Faculty of Science, Department of Physics, Spring Semester

Instructor Information

Instructor: Dr
Office Location: Faculty of Science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Atmospheric Physics**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

This course examines the dynamics of the biosphere through the study of the natural state of ecosystems. Emphasis is on the explanation of the relationships between organisms and their environment and on managing human and water resources. The application of physics to the study of the atmosphere attempts to model Earth's atmosphere and the atmospheres of the other planets using fluid flow equations, chemical models, radiation balancing, and energy transfer processes in the atmosphere (as well as how these tie into other systems such as the oceans). In order to model weather systems, atmospheric physicists employ elements of scattering theory, wave propagation models, cloud physics, statistical mechanics and spatial statistics which are highly mathematical and related to physics. It has close links to meteorology and climatology and also covers the design and construction of instruments for studying the atmosphere and the interpretation of the data they provide, including remote sensing instruments.

Course Learning Objectives

The overreaching goals of this course are: a) to examines of the dynamics of the biosphere through the study of the natural state of ecosystems; b) to provide the basic knowledge of environmental and resources studies; c) to raise awareness of the learners about the need to examine the relationships between organisms and their environment and managing human and water resources.; d) to model Earth's atmosphere and the atmospheres of the other planets using fluid flow equations, chemical models, radiation balancing, and energy transfer processes in the atmosphere (as well as how these tie into other systems such as the oceans).; e) to employ elements of scattering theory, wave propagation models, cloud physics, statistical mechanics and spatial statistics which are highly mathematical and related to physics.; f) to examine the links to meteorology and climatology; g) and also covers the design and construction of instruments for studying the atmosphere and the interpretation of the data they provide, including remote sensing instruments.

Course Objectives Learning Outcomes

Upon successful completion of this course, students will be able to:

25. Describe the biosphere through the study of the natural state of ecosystems, the relationships between organisms and their environment and managing human and water resources.
26. Explain the relationships between organisms and their environment and managing human and water resources.
27. Question the relationships between Earth's atmosphere and the atmospheres of the other planets using fluid flow equations, chemical models, radiation balancing, and energy transfer processes in the atmosphere (as well as how these tie into other systems such as the oceans).
28. Anticipate possible future environmental changes and possible development consequences.
29. Understand scattering theory, wave propagation models, cloud physics, statistical mechanics and spatial statistics which are highly mathematical and related to physics
30. Demonstrate the knowledge and understanding of the links of atmospheric physics to meteorology and climatology.
31. Use the different tools and equipments to collect data needed for studying the atmosphere and atmospheric changes,
32. Anticipate the effect of atmosphere on climate change.

- **Course Resources**

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Dynamics of the biosphere.
3		The natural state of ecosystems.
4		The links of atmospheric physics to meteorology and climatology.
5		The relationships between organisms and their environment and managing human and water resources.
6		Instruments for studying the atmosphere and the interpretation of the data they provide, including remote sensing instruments.

Basics of Environmental Sciences

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
326. Gender-sensitive response to climate change 327. Climate change communication 328. Fairness and climate change justice 329. Future climate change scenarios 330. Conflict over natural resources. 331. Multilateral environmental agreements 332. Future climate change scenarios	468. Adaptive learning and self-reflection; 469. Awareness and advocacy raising 470. Communicating 471. Contextualising 472. Critical, systemic and futures thinking 473. Debating 474. Discourse 475. Futures thinking 476. Integrated assessment 477. Leadership 478. Local knowledge	542. Accountability 543. Confident 544. Decisive 545. Democratic 546. Empathy 547. Environmental justice 548. Interdependency 549. Openness to novelty and change 550. Optimism 551. Organised 552. Respect and care for the community	60. Discuss the basic terminology and core concepts of environmental sciences. 61. Identify the physical, chemical, biological, political and economic dimensions of environment. 62. Conduct survey of environmental systems, human interactions with them and the use of distinctive areas on Earth. 63. Identify the risks of the degradation of environment. 64. Question the relation between sustainable development and clean environment. 65. Anticipate possible future environmental change and possible development consequences.

333. Policies and regulation 334. Technology and innovation 335. Consumer habits 336. Anticipation and monitoring 337. Environmental awareness 338. Environmental management 339. Green products/design 340. Green growth	479. Motivate and manage change 480. Networked learning 481. Prioritising 482. Problem solving 483. Resolve ethical dilemmas 484. Scenario analysis and planning 485. Team management	553. Respect for diversity 554. Social cohesion 555. Social responsibility 556. Social Justice 557. Basic human needs 558. Human rights 559. Sense of urgency 560. Health care 561. Inclusive participation	66. Appreciate the positive impacts of reasonable use of environmental resources. 67. Demonstrate knowledge and understanding of relationship between poverty and unsafe environment. 68. Use the different tools and equipments to conduct survey of environmental systems, human interactions with them and the use of distinctive areas on Earth. 69. Appreciate the importance of the biosphere through the study of the natural state of ecosystems.

Course Syllabus

Course Number:

Basics of Environmental Sciences

University of Port Said, Faculty of Science, Department of Environmental Sciences, Spring Semester

Instructor Information

Instructor:
Office Location: Faculty of Science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Basics of Environmental Sciences**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

This course provides an interdisciplinary survey of environmental and resources studies, examining its physical, chemical, biological, political and economic dimensions. Emphasis will be on concepts and methods that can be applied to the analysis and understanding of a range of specific environmental problems. A survey of environmental systems, human interactions with them and the use of distinctive areas on Earth are introduced. Emphasis is on environmental concepts, problems, and research methods in Egypt. This course examines the dynamics of the biosphere through the study of the natural state of ecosystems. Emphasis is on the explanation of the relationships between organisms and their environment and on managing human and water resources. In short, the course provides an appropriate chance for the students to get the minimum knowledge of safe environment.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of environmental and resources studies; b) to raise awareness of the learners about the need to examine physical, chemical, biological, political and economic dimensions of environment; c) emphasize on concepts and methods that can be applied to the analysis and understanding of a range of specific environmental problems; d) help learners to conduct survey of environmental systems, human interactions with them and the use of distinctive areas on Earth; e) use traditional and electronic tools to identify the risks of the degradation of environment; and f) to highlight the importance of the biosphere through the study of the natural state of ecosystems.

Course Objectives Learning Outcomes

Upon successful completion of this course, students will be able to:

70. Discuss the basic terminology and core concepts of environmental sciences.
71. Identify the physical, chemical, biological, political and economic dimensions of environment.
72. Conduct survey of environmental systems, human interactions with them and the use of distinctive areas on Earth.

73. Identify the risks of the degradation of environment.
74. Question the relation between sustainable development and clean environment.
75. Anticipate possible future environmental change and possible development consequences.
76. Appreciate the positive impacts of reasonable use of environmental resources.
77. Demonstrate knowledge and understanding of relationship between poverty and unsafe environment.
78. Use the different tools and equipments to conduct survey of environmental systems, human interactions with them and the use of distinctive areas on Earth.
79. Appreciate the importance of the biosphere through the study of the natural state of ecosystems.

- **Course Resources**

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Energy Resources and Supply.
3		Renewable energies and clean technologies.
		Solar Energy, solar cells, solar thermal heating systems, and electricity generation.
		Tidal and Hydro as renewable energy resources.
		Renewable Energy Integration and Energy Efficiency in the Built Environment
		Research Design Methods.

CATEGORIZATION OF POTENTIAL COURSES ACCORDING TO THE CONCENTRATION AREA		
Climate Change, Environment and Society	**Climate Change, Economics and Public Policy**	**Climate Change, Sciences and Technology**
1. Rural and urban sociology 2. Introduction to Social Welfare 3. Community health 4. Introduction to Social planning 5. Social work in one of the developed fields 6. Populations and Environmental Studies 7. Environmental studies 8. Principles of Psychology 9. Adult education and environment Work		1-Fish adaptation and climatic change 2-Paleoecology 3- Economic Geology 4- Flora of Egypt 5-Plant community 6-Plant Ecology 7- Ecology and Physiology of Algae 8- Environmental Geology

		9- Statistical Biology and Experimental Design 10- History of Engineering and Energy 11- Project management 12- Fundamentals of Thermodynamic 13-Energy conversion and utilization 14-Heat transfer 15-Renewable energy resources 16-Pollution

Description of the Environmental Psychology Course

List of cognitive concepts

Basic	Psychological	Skills	Knowledge

competencies	Traits		
Explains the causes of environmental pollution	Balances between psychological bases and entrances to the interpretation of the relationship between behavior and environment	Uses the Correlation Method	Clarifies the concept of the environment
Uses the Internet and global networks in search for programs of the most important environmental education	Concludes the goals of environmental Education	Displays the causal relationship within the framework of the experimental method	Defines the concept of environmental psychology
Acquires skills of individual's positive personal behavior	Mentions examples of types of pollution in the environment	Masters methods of collecting information and data about the phenomenon studied	States the concept of environmental education
Collects reports and information about people's responses to environmental	Suggests a roadmap for Environmental Action to try to limit environmental	Builds projective tests and measurements	Mentions the concept of environmental education

conditions	pollution		
Communicates with peers to complete assigned work.	Mentions evidence on the existence of pollution in the surroundings	Masters writing self-reports	Explains the concept of perception
Tackles self-dependence in writing research on the role of community in the reduction of environmental pollution	Concludes the negative impact on health, resulting from water pollution	Identifies the causes that lead to the occurrence or non-occurrence of a phenomenon in the context of the Descriptive Method	Enumerates the concept of environmental perception
Acquires skills of positive behavior towards the environment	Discusses ways of changing psychological attitudes toward environment	Plans to explain how difficult it is to apply the scientific method and experimental control	Clarifies principles of learning
Draws a comprehensive blueprint for the most important types of environmental	Proposes new methods to help parents raise children properly	Criticize the conduct of laboratory experiments in environmental psychology	Mentions the theoretical bases of the interpretation of the relationship between the environment and

pollution that resulted in climatic changes in the world			behavior

*** Study Plan for the course:**

Course number: ……..
Course Name: Environmental Psychology
Semester: ……..

*** Information about the instructor:**

- Instructor's Name: ……..
- Location and Office Number: ……
- Tel: ……
- Office Hours: ……
- E-mail: ……..
- Website: ……

* Definition of the course:
- Course No.:
- Course Title: Environmental Psychology
- Place:
- Timing of the lectures:
- Prerequisite:
- College Website:

*** Brief description of the course: (about 15 lines)**

The course of environmental psychology includes the following:
Chapter one: includes definition of environmental psychology, its topics, scientific methods, and the necessity that led to its emergence. Chapter two depends on developing positive behavior towards the environment and all fields in which we can improve human behavior regarding environmental issues. This means a paramount necessity for the existence of the so-called environmental instruction and environmental education in addition to causes that led to the failure of all environmental educational programs in Arab societies. The proof of this is the suffering of the environment around us from many problems, including problems of pollution, wastes, water and energy saving. In chapter three, we can recognize the psychology of environment, study its psychological and health effects on human society, and know the sources and causes of environmental pollution. Chapter four deals with ways to cure problems of the environment through the role the community and university play in the development and improvement of environment in the fight against pollution. Chapter five contains presentation of the theoretical foundations and introductions that constitute the relationship between the environment and human behavior, the formation of environmental perception and factors that affect this perception, environmental trends, and the role of the principles of learning in their composition and how they are measured.

*** Learning outcomes included in the Content; derived from the list of concepts:**

- Mention the theoretical foundations for the interpretation of the relationship between the environment and behavior.
- Explain the causes of environmental pollution.
- Acquire the skills of positive behavior towards the environment.
- Draw a comprehensive blueprint for the most serious types of pollution in the environment, which resulted in climatic changes in the world.
- Discuss ways of changing psychological attitudes toward environment.

* A list of learning sources:

فرانسيس ماك أندرو (2002). علم النفس البيئي، ترجمة: عبد اللطيف محمد خليفة، جمعة سيد يوسف، مطبوعات جامعة الكويت، الكويت.

- عبد الرحمن محمد عيسوي (1997). في علم النفس البيئي، منشأة المعارف، الإسكندرية.
- طلعت منصور غبريال (1982). البيئة والسلوك، حوليات كلية الآداب، جامعة الكويت، الحولية رقم (3)
- بين البيئة والسلوك البشري، الطبعة الأولى، الكويت، دار البحوث العلمية على عسكر، محمد الأنصاري (1993). علم النفس البيئي: تفسير نفسي للعلاقة.
- مهنا محمد غنايم (1988) من أساليب التربية البيئية في المضمون المدرسي، ندوة الإنسان والبيئة، مكتب التربية لدول الخليج، ص 76.
- والعلوم، تونس لمراحل التعليم العام في الوطن العربي ، المنظمة العربية للتربية والثقافة محمد صابر سليم، (1988) "المفاهيم الأساسية" مرجع في التعليم البيئي
- الثانوية، رسالة دكتوراه غير منشورة، والمتغيرات النفسية والاجتماعية في السلوك البيئي لدى طلاب المرحلة طارق على محمود على (2002) . أثر الوعي البيئي
بالإسماعيلية، جامعة قناة السويس مودعة مكتبة كلية التربية.
- نظيفة أحمد سرحان (2005). منهاج الخدمة الاجتماعية لحماية البيئة من التلوث، دار الفكر العربي، القاهرة.

- Websites linked to the course:

http://pubcouncil.kuniv.edu.kw/aass/homear.aspx?id=8&Root=yes&authid=469
http://www.ektab.com/

- Texts and instructional materials necessary for the course:

*** Assignments and methods of Assessment:**

- Assessment will be graded on a scale of zero to 10 marks, and the degree of success starts at 50% or 60%
- Assessment Policy

Assignments	80
Tests	----
Attendance and participation	20
Total	100

*** Policies adopted in teaching the course:**

- Delays in the delivery of assignments?!
- Methods or **(policies)** of classroom management:
- Dealing with learners with disabilities:

*** Timetable of lectures (lessons):**

Week	Date	Subject
One & Two		Environmental Psychology: definition, theme and methods
Three & Four		The development of positive behavior towards the environment
Five & Six		Psychology of the environment, and its health and psychological effects
Seven & Eight		Ways to solve environmental problems
Nine & Ten		Theoretical bases that explain the relationship between environment and behavioral - environmental perception
Eleven & Twelve		Environmental attitudes

Thirteen & fourteen		Suggested activities

*** Guiding model for course modules**

Module I: Environmental Psychology: definition, themes, and methods

- The basic concepts of the module: concept of the environment - concept of environmental psychology
- A brief description of the Module: definition of the environment and its types, topics of environmental psychology and necessity that led to its emergence, curricula used in it, and what characterizes it
- Module goal: is to identify the environment and its types, and environmental psychology as a science that should be studied
- Learning Outcomes: It is expected that the student will be, after the completion of the lesson, able to:

(A) state the concept of environmental psychology.
(B) discuss the necessity that led to the emergence of environmental psychology.
(C) clarify the curricula used in the study of environmental psychology with no errors.

*** Activities**

1. Visiting the Association and the Council of Environmental Protection, and attempting to execute their objectives
2. Designing or developing a program for environmental awareness
3 Picking pictures out of newspapers and magazines, and analyzing their content, then comparing among them in terms of their expected impact
4. Coming up with the concept of each of these four words: information - fact - law - theory
5. Choosing one of the theories of psychology, and the stages of concluding it.
6. Student presents: what s/he feels, and how s/he behaves when s/he faces one of the situations mentioned in the introductions assigned for the interpretation of the relationship between environment and behavior, for his/her peers.

7. A student presents one of the situations in which s/he feels adapted, and the ones in which s/he lacks his/her ability, and compares between the causes of each feeling.
8 What is the relationship among the following processes: sensation, attention, perception?
9 In one situation, different individuals develop different perceptions. Explain via environmental situations you have experienced?
10 Students' choice of two environmentally different residential areas and recording the reaction of the population at the time of the processes of repair in their streets for a relatively long period; perspective of the student to express his/her opinion is to be taken into account.
11. Posing an open-ended question on at least ten members whether they are aware of the dangers threatening the environment in which they are present
12 Making a comparison between the four different definitions of psychological attitude, using a number of references
13. The attitude of student may change towards an a particular environmental or social issue, and then s/he identifies the factors that were behind the change.
14. Concluding the relationship between programs that some candidates present and voters' attitudes in certain areas.
15. Thinking in a certain way to get to know the attitudes of population of the local environment towards a large project will lead to a comprehensive environmental change.

Additional sources for reading

- فرانسيس ماك أندرو (2002). علم النفس البيئي، ترجمة: عبد اللطيف محمد خليفة، جمعة سيد يوسف، مطبوعات جامعة الكويت، الكويت.
- عبد الرحمن محمد عيسوي (1997). في علم النفس البيئي، منشأة المعارف، الإسكندرية.
- طلعت منصور غبريال (1982). البيئة والسلوك، حوليات كلية الآداب، جامعة الكويت، الحولية رقم (3)
- بين البيئة والسلوك البشري، الطبعة الأولى، الكويت، دار البحوث العلمية على عسكر، محمد الأنصاري (1993). علم النفس البيئي: تفسير نفسي للعلاقة.
- مهنا محمد غنايم (1988) من أساليب التربية البيئية في المضمون المدرسي، ندوة الإنسان والبيئة، مكتب التربية لدول الخليج، ص 76.
- والعلوم، تونس لمراحل التعليم العام في الوطن العربي ، المنظمة العربية للتربية والثقافة محمد صابر سليم، (1988) "المفاهيم الأساسية" مرجع في التعليم البيئي
- الثانوية، رسالة دكتوراه غير منشورة، مودعة مكتبة كلية والمتغيرات النفسية والاجتماعية في السلوك البيئي لدى طلاب المرحلة طارق على محمود على (2002) . أثر الوعي البيئي بالإسماعيلية، جامعة قناة السويس التربية.
- نظيفة أحمد سرحان (2005). منهاج الخدمة الاجتماعية لحماية البيئة من التلوث، دار الفكر العربي، القاهرة.

Activities and assignments performed by student are to be written inside the auditorium to achieve the objectives of the module.

Example: Reading an article on a subject of a module and summarizing it in English, then translating the summary into Arabic, and finally presenting it to discussion with student's peers.

Dr. Hesham El-Nersh
Assistant Educational Psychology professor
Faculty of Education
Port Said University

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number:

Environmental Education Anthropology

Port Said University, Faculty of Education, Department of Foundations of Education,

Instructor Information

Instructor: Dr. Mohamed Maher Mahmoud Hanafy
Office Location: Port Said University - Egypt
Telephone: 01224729050
Office Hours:
E-mail: maher_doctor@yahoo.com
Website:

Course Identification

Course Number:
Course Name: Environmental Education Anthropology
Course Location: University Campus
Class Times:
Prerequisites:
Faculty Web Page:

Course Description/Overview

Anthropology is interested in studying human, like other human sciences, which are closely linked to the humanitarian community in which they exist, they reflect its core values prevailing in it, and then help the community improvement and development, the study of environmental and climatic changes has become one of the social sciences and humanities concerns, which including the Anthropology, some of the recent trends in environmental studies, anthropological have been occurred , and these trends study the human adaptive with global environmental changes and developing solutions to many of the environmental problems, and this course shows the nature of the relationship between Anthropology and climate change as the results for man's behavior towards his environment, the course has been divided into five sections: the first section entitled "what is Anthropology," this section deals with the concept of Anthropology, and its objectives, and scope, and its relations to other sciences, the second section entitled "environmental Education", and deals with the concept of environmental education, its goals, and the process of environmental awareness, the third section titled "global climate changes, current and future," it deals with the most important global climate changes, and then the fourth section entitled "The harms of climate changes," it deals with harms of climatic changes and their impact on human health and the physical and natural environment, and finally the fifth section entitled "Mechanisms of the development of environmental awareness among members of the community" by clarifying the role of formal and informal educational institutions in achieving and reduce environmental harms from climate changes.

Course Learning Objectives

The overarching goals of this course are:

1- Identify the communities cultures and behaviors towards climate changes.

2 Monitor the most important risks of climate changes on the environment and humans.

3 Raise the level of community awareness towards the dangers and harms of climate changes.

4 providing a critical study of the individuals behaviors to various climatic changes.
5. Activating the role of formal and informal educational institutions, in achieving and reduce environmental harms from climate change.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

7. Define the concept of Anthropology and its most important fields and objectives.
8. Clarify the relationship between Anthropology and other sciences.
9. Comparison between the fields of anthropological studies.
10. Show the awareness of global climate changes.
11. Benefit from the programs of educational institutions in modifying the behavior of individuals towards the environment.
12. Develop proposals for how to deal with global climate changes.

Course Resources

Course Website(s)

Required Course Texts and Materials

13. Hassan Mohammed Hassan: Anthropology of Education and the education problems of the big cities, dar althkafa, Cairo, 1980.
14. Mohammed Abbas Ibrahim: The Sub-Culture, dar almearfa algameia, Alexandria 1985.

15. Mohammed El-gohary: anthropology, The Theory Founded and Practical Applications, dar almearfa algameia, Alexandria 0.2005 m.
16. Yahya Badr Morsi Eid: Anthropology Origins, , dar alwafaa, Alexandria , 2007 m.
17. Isa AlShmas: Introduction to Anthropology (Anthropology), the Arab Writers Union, Damascus , 2004 m.
18. Farooq Ahmed Mustafa: Introduction and Antrbeological studies, dar almearfa algameia. Alexandria, 1989 m.
19. Ahmed Hussein ALLaqany and Fareaa Hassan Mohamed: Environmental education , The Duty and the Responsibility, the world of books, Cairo, 1999.
20. Edward Pritchard: Social Anthropology, translation: Ahmed Abu Zaid, the fifth edition, the Egyptian General Book, 1975 m.
21. Assem Shehabi: The Impact of Climate Changes on Human Health, http://www.philadelphia.edu.jo/philadreview/issue5/no5/22.pdf
22. Essam El-Din Hilal : Environmental Education, the Egyptian General Book, Cairo, 2007.
23. Sabri Eldemerdash: environmental education, model, investigation, and Calendar, Knowledge House, Cairo, 1988.
24. Mohammed elsayed Arnaout: human and environmental pollution, Egyptian-Lebanese house, Cairo, 1993.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	40%
Exams	40%
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		The concept of Anthropology- inception - objectives - fields
3		Relationship between Anthropology and other scienc
4		The concept of environmental education and its goals
5		The Current and Future Global Climate Changes
6		The Harms of Climate Changes on the Natural Environment
7		The Harms of Climate Changes on the physical

		environment
8		The Harms of Climate Changes on human health
9		The role of formal educational institutions in raising awareness of the climate changes harms and reduce it.
10		The role of informal educational institutions in raising awareness of the climate changes harms and reduce it.
11		The role of technology in reducing the harms of climate changes
12		Activation of social networking sites to modify some of the behaviors that cause climate changes through action or animated videos and other.

APENDIX II: The CLIMASP Course Modules Template Example

Course	Environmental Education Anthropology
Module 1	Curriculum: What is Anthropology
Key Concepts	Anthropology and its goals , fields and types
Overview	This Module appears Introduction to Anthropology and its importance in the study of the cultural history of human society, and the most important areas that concerned and its relationship to other sciences.
Aim	The main objective of this Module to know the nature of science Anthropology and its relationship to human behaviors, which is the main reason for the occurrence of climatic changes.
Learning Outcomes	At the end of this module learners will be able to: Identify the concept and the nature of Anthropology. Compare between the different areas of anthropology. Clarify the relationship of Anthropology and other sciences.
Units	Unit 1.1 Anthropology (concept, objectives and fields) Unit 1.2: The Relationship between Anthropology and ot sciences.
Readings	Fulya Damla Kentli (2009). Comparison of hidden curriculum theories. European Journal of Educational Studies 1 (2) 83-88. Grundy, S. (1987) *Curriculum: Product or Praxis*, Lewes: Falmer

	Aristotle (1976) *The Nicomachean Ethics* ('Ethics'), Harmondsworth: Penguin. Chapter 3: Curriculum Theory. http://www.sagepub.com/upm-data/6042_Chapter_3_Glatthorn_(Sage)_I_Proof_2.pdf Watson, D. (2001). Pedagogy before technology: Re-thinking the relationship between ICT and teaching. Education and Information Technologies 6:4, 251–266
Activity	Writing an essay about the role of Anthropology in studying the human culture throughout the ages.
Module 2	Environmental Education
Key Concepts	Environmental Education- population
Overview	This Module appears the nature of environmental education and its most important fields, and objectives, and how to use technology in the preservation of the environment.
Aim	The objective of this Module is knowing the concept of environmental education and its objectives, and to clarify the impact of population activities on the environment, as well as to provide students with some practices associated with environmental

	education, and how to use technology to preserve them.
Learning Outcomes	• At the end of this module learners will be able to: • Define the concept of environmental education and goals. • Knowing the global efforts towards the preservation of the environment. • Optimize the use of technology to solve environmental problems. • Diagnosis of the current situation of environmental pollution.
Units	Unit 2.1: Environmental Education (concept - targets). Unit 2.2: The role of technology in preserving the environment. Unit 2.3: The global efforts to preserve the environment
Readings	Magdy Aziz Ibrahim: environmental education in the curricula of public education, the Anglo-Egyptian Library, Cairo, 2001.
Activity	**Overview**
	1-View documentary film about how to recycle waste. 2-Implementation workshops on how to recycle waste 3-Conducting field research on the most important aspects of environmental pollution in the local community. 4-Implementation of a forestation campaigns for the local community to reduce air pollution.

Module 3	Climate changes
Key Concepts	Climate changes
Overview	This Module appears the nature of climate changes and the most important forms and causes, and the role of human behavior in its occurrence.
Aim	This module aims at knowing the forms of climate changes and its most important reasons, and the most important international practices relating to the policies of adaptation to climate changes and mitigation.
Learning Outcomes	At the end of this module learners will be able to: • Identify the causes of climate changes. • Compare the best international practices on adaptation to climate changes and mitigation.
Units	Unit 3.1: Climate change: forms and causes Unit 3.2: The International practices to adapt to climate change and reduce its impact.
Readings	Abdul Wahab Bin Rajab Hashim bin Sadiq: Environmental Crimes and ways of confrontation, the Center for Studies and Research, Naif Arab University for Security Sciences, Riyadh,

	2006.
Activity	Make Atlas illustrates the most important of climate changes forms, its causes and the most affected areas by them.
Module 4	The harms of climate changes
Key Concepts	harms of climate changes
Overview	This Module appears the harms of climate changes on the physical and natural environment and human health, and revenge on the countries' economies and food security.
Aim	The overriding aim of this module is to study the impact of climate changes on human and natural and physical environment.
Learning Outcomes	At the end of this module learners will be able to: • Identify the harms of climate changes. • Educate communities with the climate changes effects
Units	Unit 3.1: The Harm of climate change on human health. Unit 3.2: The Harm of climate change on physical environment Unit 3.3: The Harm of climate change on natural environment
Readings	4- Ahmed Midhat Islam: the problem of environmental pollution era, wrote a series of monthly issued by the National Council for Culture, Arts and Letters, the world of knowledge, Kuwait, 1990. 5- Rachid Salmi: the impact of environmental pollution in

	economic development in Algeria, Ph.D. thesis, Faculty of Economic Sciences of management, University of Algiers 2006. 6- Mohamed Mahmoud Sergani: liability for environmental damage, a comparative study between international law and Islamic law, Umm Al-Qura University Journal of Educational Sciences, social, humanitarian, first edition, Volume XIII, presses Umm Al Qura University, Mecca, in January 2001
Activity	**Overview**
	Make field research on the most important harms of climate changes in the community.
Module 5	Mechanisms for the development of environmental awareness among members of the community
Key Concepts	environmental awareness
Overview	This Module appears the mechanisms development of environmental awareness to members of the community and reduce harms of the climate changes through activating the role of formal educational institutions (schools and universities) and informal (family - the media - civil society

	organizations).
Aim	The overriding aim of this module is to raise the level of environmental awareness among students is to help them adapt to climate change and the reduction of increasing severity.
Learning Outcomes	At the end of this module learners will be able to: • Define the role of formal and informal educational institutions, in developing the environmental awareness among members of the community. • practice patterns behaviors aimed at adapting to climate change and work on mitigation
Units	Unit 5.1: - The role of formal educational institutions in limiting the harms of climate changes. Unit 5.2: The role of informal educational institutions in limiting the harms of climate changes.
Readings	Najib Saab: the environment in the Arab media, the first Arab Media Forum for Environment and Sustainable Development, Cairo, 2006.
Activity	**Overview**
	Designing educational videos shows the harms of climate changes and how to deal with it.

	Designing Videos emphasizes the rejection of wrong behaviors that cause climate change.

Environmental Microbiology

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
341. Environmental awareness 342. Climate change communication 343. Fairness and climate change justice 344. Future climate change scenarios 345. Technology and	486. Adaptive learning and self-reflection; 487. Awareness and advocacy raising 488. Communicating 489. Contextualising 490. Critical, systemic and futures thinking 491. Debating	562. Accountability 563. Confident 564. Decisive 565. Democratic 566. Empathy 567. Environmental justice 568. Openness to novelty and change	1) Discuss current environmental issues with an understanding of the basic ecological concepts involved. 2) Use an interdisciplinary approach to analyze environmental issues/problems; show knowledge of the interplay between the ecological, political, social, cultural and economic aspects of environmental problems. 3) Develop a worldview related to an understanding of

innovation 346. Climate change implications for integrated coastal planning 347. Risk assessment 348. Climate variability 349. Climate change communication 350. Climate change and health 351. Strategic planning and climate change 352. Role of international institutions 353. Climate change: Science, impacts & scenarios 354. Future climate change scenarios	492. Discourse 493. Futures thinking 494. Integrated assessment 495. Leadership 496. Local knowledge 497. Motivate and manage change 498. Networked learning 499. Prioritising 500. Problem solving 501. Resolve ethical dilemmas 502. Scenario analysis and planning 503. Team management	569. Optimism 570. Organised 571. Respect and care for the community 572. Respect for diversity 573. Social responsibility 574. Transparency 575. Sense of urgency 576. Human wellbeing 577. Human rights 578. Social responsibility 579. Perspective 580. Co-responsibility 581. Systematic 582. Focussed	current environmental issues and how global problems affect us locally. 4) Demonstrate an understanding of core ecological principles, and define scientific principles and concepts as related to environmental studies and sustainability. 5) Participate in basic field ecology research and experiments according to the scientific method.

Course Syllabus

Course Number:

Environmental Microbiology

Port Said University, Faculty of science, Department of Environmental Sciences,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Environmental Microbiology**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

This course introduces environmental processes and the influence of human activities upon them. Topics include environmental sustainability, ecology and evolution, population growth, natural resources, and a focus on current environmental problems from scientific, social, political, and economic perspectives. Upon completion, students should be able to demonstrate an understanding of environmental interrelationships and of contemporary environmental issues. This course has been approved to satisfy the Comprehensive Articulation Agreement general education core requirement in natural sciences/mathematics.

Course Learning Objectives

The overarching goals of this course are: a) to provide a a broad base of ecosystems biology, environmental microbiology, pollution monitoring, ecotoxicology and environmental biochemistry; b) to raise awareness of the learners about the important aspects of ecosystems and biodiversity, evolution, animal and plant physiology, environmental microbiology and molecular and cellular biology; c) and help learners Prepare for a careers in such field as environmental protection, research, consultancy and ecosystems management.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1) Discuss current environmental issues with an understanding of the basic ecological concepts involved.
2) Use an interdisciplinary approach to analyze environmental issues/problems; show
knowledge of the interplay between the ecological, political, social, cultural and economic aspects of environmental problems.
3) Develop a worldview related to an understanding of current environmental issues and how global problems affect us locally.

4) Demonstrate an understanding of core ecological principles, and define scientific principles and concepts as related to environmental studies and sustainability.
5) Participate in basic field ecology research and experiments according to the scientific method.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		The Biosphere.
3		Environmental Resources
4		Environmental Threats
5		*Environmental Biology and Public Policy*
6		Skills in Biological Investigation and Experimentation

Environmental Sciences

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
30. Environmental awareness 31. Environmental ethics 32. Biodiversity and climate change 33. Climate change adaptation 34. Urbanization's role in climate change 35. Water resources and climate change Social learning processes 36. Water management and recycling	67. Adaptive learning and self-reflection; 68. Awareness and advocacy raising 69. Carbon literacy for procurement 70. Communicating 71. Contextualising 72. Critical, systemic and futures thinking 73. Debating 74. Discourse 75. Emergency psychology 76. Futures thinking 77. Global dynamics 78. Integrated assessment 79. Leadership 80. Local knowledge 81. Mapping gender impacts 82. Motivate and manage change 83. Networked learning 84. Prioritising	67. Accountability 68. Confident 69. Decisive 70. Democratic 71. Empathy 72. Environmental justice 73. Gender-sensitive 74. Global mind-set/ consciousness 75. Interdependency 76. Needs vs. wants 77. Nonviolence & peace 78. Openness to novelty and change 79. Optimism 80. Organised 81. Respect and care for the community 82. Respect for diversity 83. Social cohesion 84. Social responsibility 85. Stewardship	40. Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community. 41. Analyse methods of ensuring local participation in climate change adaptation. 42. Analyze the effects of climate change from both male and female perspectives 43. Compare and contrast the impacts of major climatic hazards on livelihoods of the community. 44. Comprehend the significance of the climate change problem locally and globally. 45. Describe the relationship between human activities and climate change. 46. Demonstrate an understanding of the natural carbon cycle. 47. Explore solutions to problems that cause climate change. 48. Identify ways to reduce the school's carbon footprint. 49. Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in.

	85. Problem solving 86. Resolve ethical dilemmas 87. Scenario analysis and planning 88. Team management	86. Tolerance 87. Transparency 88. Virtue	50. Investigate the causes of climate change. 51. Propose solutions to climate change issues. 52. Understand how human actions are contributing to global environmental change.

Course Syllabus

Course Number:

Environmental Sciences

University of Port Said, Faculty of Education, Department of Curricula and Methods of Teaching,

Fall Semester, 2013-2014

Instructor Information

Instructor: Dr Mahmoud Mohasseb
Office Location: Faculty of Education Campus
Telephone: Office –
Office Hours: Tuesday 14.30- 17.00, Wednsday 14.00 – 16.00
E-mail:
Website:

Course Identification

Course Number: **Γ0**
Course Name: **Environmental Sciences**
Course Location: University Campus
Class Times: Wednesday 8:30pm – 11:30am

Prerequisites:
Faculty Web Page:

Course Description/Overview

Education can be the catalyst for empowering students to become critical, reflective and active citizens. Teachers have the potential to be what Giroux and McLaren described as transformative intellectuals who combine scholarly reflection and practice in the service of educating students to be thoughtful, active citizens. The present course is intended to raise the students' environmental awareness. It introduces them to the environmental challenges resulting from climate change. It does so through tackling the following logically sequenced seven issues: 1) Environmental awareness; 2)Environmental ethics; 3) Biodiversity and climate change; 4) Climate change adaptation; 5) Urbanization's role in climate change; 6) Water resources and climate change Social learning processes; and 7) Water management and recycling. Issues 5-7 are, however, deeply covered through active participation of the students. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is, they are asked to read and summarize articles on climate changes. They are invited to discuss scenarios for the management of water resources at local, national and international scales. In short, the course provides an appropriate chance for the students practice their role as future citizens.

Course Learning Objectives

The overarching goals of this course are: a) to provide a critical approach to the negative environmental consequences of climate changes – at local, national and international scales - in the context of education for sustainability; b) raise awareness of the role of the learners to reflect critically on the rights, roles and responsibilities of an active citizen in preparing for the management of critical environmental issues; and c) use traditional and electronic resources as well as social networking technologies as tools to help the community, including children, identify risks and develop climate change adaptation strategies.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

- Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community.
- Analyse methods of ensuring local participation in climate change adaptation.
- Analyze the effects of climate change from both male and female perspectives
- Compare and contrast the impacts of major climatic hazards on livelihoods of the community.
- Comprehend the significance of the climate change problem locally and globally.
- Describe the relationship between human activities and climate change.
- Demonstrate an understanding of the natural carbon cycle.
- Explore solutions to problems that cause climate change.
- Identify ways to reduce the school's carbon footprint.
- Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in.
- Investigate the causes of climate change.
- Propose solutions to climate change issues.
- Understand how human actions are contributing to global environmental change. Course Resources

Course Website(s)

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class
- Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness &id=7141986**
- **Paul Pojman** Environmental Ethics: Readings in Theory and Application Paperback – January 1, 2007
- Oxford Dictionary of Philosophy: environmental ethics, **http://www.answers**. com/topic/environmental-ethics
- Shah, Anup. "Biodiversity." *Global Issues*. 19 Jan. 2014. Web. 10 Sep. 2014. <http://www.globalissues.org/issue/169/biodiversity>.
- Doucet, C. (2007) *Urban Meltdown: Cities, Climate Change and Politics as Usual*, New Society Publishers, Gabriola Island BC.
- Dow, K. and Downing, T. (2006) *The Atlas of Climate Change: Mapping the World's Greatest Challenge*, University of California Press, Berkeley.
- Flannery, T. (2005) *The Weather Makers: How Man is Changing the Climate and What It Means for Life on Earth*, Atlantic Monthly Press NY.
- Hansen, J. (2010) *Storms of My Grandchildren: The Truth about the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, Bloomsbury, New York.
- Henson, R. (2008) *The Gough Guide to Climate Change: The Symptoms, The Science, The Solutions*, Rough Guides, London.
- Holper, P. and Torok, S. (2008) *Climate Change: What You Can do about It at Work, at Home, at School*, Pan Macmillan,Sydney.
- Hulme, M. (2009) *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*, Cambridge University Press, Cambridge.
- Johansen, B. (2006) *Global Warming in the Twenty-First Century*, Praeger Publishers, Westport CT.
- Moser, S. and Dilling, L. (eds) (2007) *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*, Cambridge University Press, Cambridge.

- United Nations Development Programme (2007) *Fighting Climate Change: Human Solidarity in a Divided World: Human Development Report 2007-2008*, Palgrave Macmillan, Basingstoke, UK.
- *Layperson's Guide to Water Recycling and Reuse*, published in 1992 by the Water Education Foundation, Sacramento, California.
- Video, entitled *Water from Water: Recycling*, produced in 1995 by National Water Research Institute, Fountain Valley, California.
- Research On Recycled Water is done by EPA through the Office of Research and Development.
- Water Recycling and Reuse: The Environmental Benefits http://www.epa. gov/region9/water/recycling/
- CCSP (2008). *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Backlund, P., A. Janetos, D. Schimel, J. Hatfield, K. Boote, P. Fay, L. Hahn, C. Izaurralde, B.A. Kimball, T. Mader, J. Morgan, D. Ort, W. Polley, A. Thomson, D. Wolfe, M. Ryan, S. Archer, R. Birdsey, C. Dahm, L. Heath, J. Hicke, D. Hollinger, T. Huxman, G. Okin, R. Oren, J. Randerson, W. Schlesinger, D. Lettenmaier, D. Major, L. Poff, S. Running, L. Hansen, D. Inouye, B.P. Kelly, L Meyerson, B. Peterson, and R. Shaw. U.S. Environmental Protection Agency, Washington, DC, USA.
- Kundzewicz, Z.W., L.J. Mata, N.W. Arnell, P. Döll, P. Kabat, B. Jiménez, K.A. Miller, T. Oki, Z. Sen, and I.A. Shiklomanov (2007). Freshwater resources and their management. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability* . EXIT Disclaimer *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds.)]. Cambridge University Press, Cambridge, United Kingdom.
- CCSP (2009). *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Titus, J.G. (Coordinating Lead Author), Anderson, K.E., Cahoon, D.R., Gesch, D.B., Gill, S.K., Gutierrez, B.T., Thieler, E.R., Williams, S.J. (Lead Authors). U.S. Environmental Protection Agency, Washington, DC, USA.
- CCSP (2008). *Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Julius, S.H., J.M. West (eds.), J.S. Baron, B. Griffith, L.A. Joyce, P. Kareiva, B.D. Keller, M.A. Palmer, C.H. Peterson, and J.M. Scott (authors). U.S. Environmental Protection Agency, Washington, DC, USA.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Environmental awareness
3		Environmental ethics
4		Biodiversity and climate change
5		Climate change adaptation
6		Urbanization's role in climate change
7		Water resources and climate change Social learning processes (FORUM 1)
8		Water resources and climate change Social learning processes (FORUM 2)
9		Water resources and climate change Social learning processes (FORUM 3)
10-15		Water management and recycling (concepts, feasibility and consequences, techniques, national and international models)

Course Modules

Course	Environmental Sciences
Module 1	Environment: Ethics and Awareness
Key Concepts	Environmental awareness, Environmental ethics
Overview	Environmental awareness is to understand the fragility of our environment and the importance of its protection. Promoting environmental awareness is an easy way to become an environmental steward and participate in creating a brighter future for our children. To define environmental awareness we must first understand the environmentalist movement. Environmentalism is an ideology that evokes the necessity and responsibility of humans to respect, protect, and preserve the natural world from its anthropogenic (caused by humans) afflictions. Environmental awareness is an integral part of the movement's success. By teaching our students, friends and family that the physical environment is fragile and indispensable. Students need to start fixing the problems that threaten it. Environmental ethics, on the other hand, is the part of environmental philosophy which considers extending the traditional boundaries of ethics from solely including humans to including the non-human world. It exerts influence on a large range of disciplines including environmental law, environmental sociology, ecotheology, ecological economics, ecology and geography. There are many ethical decisions that human beings make with respect to the environment. Throughout this module, students are invited to share and exchange ideas about issues related to : clear cut forests for the sake of human consumption, propagation of species, gasoline powered vehicles, etc.
Aim	The overriding aim of this module is to turn students able to discourse how human actions are contributing to global environmental change.
Learning Outcomes	At the end of this module learners will be able to: • Collect, interpret and present information about strategies to confront

	climate change to a variety of audiences, including other students, parents and the local community. • understand how human actions are contributing to global environmental change.
Units	Unit 1.1: Environmental awareness Unit 1.2: Environmental ethics
Readings	• Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness&id=7141986** • **Paul Pojman** Environmental Ethics: Readings in Theory and Application Paperback – January 1, 2007 • Oxford Dictionary of Philosophy: environmental ethics, **http://www. answers**. com/topic/environmental-ethics
Activity	**Overview** Assignment 1.1: Reflecting Upon the following issues: • clear cut forests for the sake of human consumption. • propagating our species, and life itself. • make gasoline powered vehicles. • environmental obligations needed to keep for future generations. • the extinction of a species for the convenience of humanity. • Methods for best use and conserve of the space environment to secure and expand life.
Module 2	Biodiversity and Climate Change
Key Concepts	Biodiversity, Climate, Climate Change
Overview	In the atmosphere, gases such as water vapour, carbon dioxide, ozone, and methane act like the glass roof of a greenhouse by trapping heat and warming the planet. These gases are called greenhouse gases. The natural levels of these

	gases are being supplemented by emissions resulting from human activities, such as the burning of fossil fuels, farming activities and land-use changes. As a result, the Earth's surface and lower atmosphere are warming, and this rise in temperature is accompanied by many other changes. Rising levels of greenhouse gases are already changing the climate. These changes are affecting the entire world, from low-lying islands in the tropics to the vast polar regions. Also, Climate change affects biodiversity. It becomes one of the most significant drivers of biodiversity loss by the end of the century. It is already forcing biodiversity to adapt either through shifting habitat, changing life cycles, or the development of new physical traits. In this module, students need to realize that, conserving natural terrestrial, freshwater and marine ecosystems and restoring degraded ecosystems (including their genetic and species diversity) is essential for human well-being. Biodiversity can support efforts to reduce the negative effects of climate change. Conserved or restored habitats can remove carbon dioxide from the atmosphere, thus helping to address climate change by storing carbon (for example,reducing emissions from deforestation and forest degradation). Moreover, conserving in-tact ecosystems, such as mangroves, for example, can help reduce the disastrous impacts of climate change such as flooding and storm surges.
Aim	The overriding aim of this module is to realize the interrelationship between biodiversity and climate change
Learning Outcomes	Students will be able to: • Analyse methods of ensuring local participation in climate change adaptation. • Analyze the effects of climate change from both male and female perspectives
Units	Unit 2.1: Biodiversity, Climate, Unit 2.2: Climate Change

	Unit 2.3: Climate Change Adaptation
Readings	Shah, Anup. "Biodiversity." *Global Issues*. 19 Jan. 2014. Web. 10 Sep. 2014. <http://www.globalissues.org/issue/169/biodiversity>. • Doucet, C. (2007) *Urban Meltdown: Cities, Climate Change and Politics as Usual*, New Society Publishers, Gabriola Island BC. • Dow, K. and Downing, T. (2006) *The Atlas of Climate Change: Mapping the World's Greatest Challenge*, University of California Press, Berkeley. • Flannery, T. (2005) *The Weather Makers: How Man is Changing the Climate and What It Means for Life on Earth*, Atlantic Monthly Press NY. • Hansen, J. (2010) *Storms of My Grandchildren: The Truth about the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, Bloomsbury, New York. • Henson, R. (2008) *The Gough Guide to Climate Change: The Symptoms, The Science, The Solutions*, Rough Guides, London.
Activity	**Overview**
	Work in group to: - Collect information on biodiversity in your local environment. - Collect evidence on the effects of climate change on biodiversity in your local environment during the last fifty years. - Propose a strategy to protect biodiversity in your local environment.
Module 3	**Urbanization and Climate Change**
Key Concepts	Urbanization
Overview	This Module deals with the implications of population growth and urbanization for climate change in terms of the contribution of urban populations (and centres) to human induced climate change. It emphasizes how it is not the growth in (urban or rural) population but the growth in consumption that drives

	the growth in greenhouse gas emissions and that a significant proportion of the world's urban (and rural) population have consumption levels that are so low that they contribute little or nothing to such emissions. In this module students discuss how in the much-needed planning for global emissions reduction, provisions must be made to allow low-income low-consumption households with greenhouse gas emissions below the 'fair-share' level to increase their consumption.
Aim	This module aims at examining the relationship between urbanization and climate change.
Learning Outcomes	At the end of this module learners will be able to: • Describe the relationship between human activities and climate change. • Demonstrate an understanding of the natural carbon cycle.
Units	Unit 3.1: Urbanization *Unit 3.2: Urbanization a Mixed Blessing* Unit 3.3: Urbanization and Climate Change
Readings	• David Satterthwaite The implications of population growth and urbanization for climate change, Paper presented at Expert-Group Meeting on Population Dynamics and Climate Change, UNFPA and IIED In Collaboration with UN-HABITAT and the Population Division, UN/DESA 24 to 25 June 2009 • Holper, P. and Torok, S. (2008) *Climate Change: What You Can do about It at Work, at Home, at School*, Pan Macmillan,Sydney. • Hulme, M. (2009) *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*, Cambridge University Press, Cambridge. • Johansen, B. (2006) *Global Warming in the Twenty-First Century*, Praeger Publishers, Westport CT.

	• Moser, S. and Dilling, L. (eds) (2007) *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*, Cambridge University Press, Cambridge.
Activity	**Overview**
	Assignment : Prepare a lecture either of following themes 7. Urbanization: cons and pros 8. Urbanization and Carbon Cycle
Module 4	Water Resources and Climate Change
Key Concepts	Water resources management, Social learning processes
Overview	Water resources are important to both society and ecosystems. We depend on a reliable, clean supply of drinking water to sustain our health. We also need water for agriculture, energy production, navigation, recreation, and manufacturing. Many of these uses put pressure on water resources, stresses that are likely to be exacerbated by climate change. In many areas, climate change is likely to increasewater demand while shrinking water supplies. This shifting balance would challenge water managers to simultaneously meet the needs of growing communities, sensitive ecosystems, farmers, ranchers, energy producers, and manufacturers. In this module need to realize that in some areas, water shortages will be less of a problem than increases in runoff, flooding, or sea level rise. These effects can reduce the quality of water and can damage the infrastructure that we use to transport and deliver water.
Aim	The overriding aim of this module is realize the interrelationship between water resources management and climate change
Learning Outcomes	At the end of this module learners will be able to: • Compare and contrast the impacts of major climatic hazards on livelihoods of the community. • Comprehend the significance of the climate change problem locally and

	globally. • Explore solutions to problems that cause climate change.
Units	Unit 4.1: Water Resources and Climate Change Unit 4.2: Climate change Social learning processes
Readings	• CCSP (2008). *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Backlund, P., A. Janetos, D. Schimel, J. Hatfield, K. Boote, P. Fay, L. Hahn, C. Izaurralde, B.A. Kimball, T. Mader, J. Morgan, D. Ort, W. Polley, A. Thomson, D. Wolfe, M. Ryan, S. Archer, R. Birdsey, C. Dahm, L. Heath, J. Hicke, D. Hollinger, T. Huxman, G. Okin, R. Oren, J. Randerson, W. Schlesinger, D. Lettenmaier, D. Major, L. Poff, S. Running, L. Hansen, D. Inouye, B.P. Kelly, L Meyerson, B. Peterson, and R. Shaw. U.S. Environmental Protection Agency, Washington, DC, USA. • Kundzewicz, Z.W., L.J. Mata, N.W. Arnell, P. Döll, P. Kabat, B. Jiménez, K.A. Miller, T. Oki, Z. Sen, and I.A. Shiklomanov (2007). Freshwater resources and their management. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability* . EXIT Disclaimer *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds.)]. Cambridge University Press, Cambridge, United Kingdom. • CCSP (2009). *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Titus, J.G. (Coordinating Lead Author), Anderson, K.E., Cahoon, D.R., Gesch, D.B., Gill, S.K., Gutierrez, B.T., Thieler, E.R., Williams, S.J. (Lead Authors).

	U.S. Environmental Protection Agency, Washington, DC, USA. • CCSP (2008). *Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Julius, S.H., J.M. West (eds.), J.S. Baron, B. Griffith, L.A. Joyce, P. Kareiva, B.D. Keller, M.A. Palmer, C.H. Peterson, and J.M. Scott (authors). U.S. Environmental Protection Agency, Washington, DC, USA.
Activity	**Overview**
	• **Assignment**: plan a seminar on major climatic hazards on livelihoods of the community comparing the problems of water shortages and those of water increases
Module 5	**Water Management and Recycling**
Key Concepts	Water management and recycling processes, techniques
Overview	Water cycle is a delicate balance of precipitation, evaporation, and all of the steps in between. Warmer temperatures increase the rate of evaporation of water into the atmosphere, in effect increasing the atmosphere's capacity to "hold" water. Increased evaporation may dry out some areas and fall as excess precipitation on other areas. Changes in the amount of rain falling during storms provide evidence that the water cycle is already changing. Rising temperatures cause snow to begin melting earlier in the year. This alters the timing of stream flow in rivers that have their sources in mountainous areas. As temperatures rise, people and animals need more water to maintain their health and thrive. Many important economic activities, like producing energy at power plants, raising livestock, and growing food crops, also require water. The amount of water available for these activities may be reduced as Earth warms, and if competition for water resources increases.
Aim	The overriding aim of this module is to equip students with the capacity to debate on water management and recycling processes, techniques and feasibility>

Learning Outcomes	At the end of this module learners will be able to: • Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in. • Investigate the causes of climate change. • Propose solutions to climate change issues.
Units	Unit 5.1: Water management (concepts; national and international models) Unit 5.2: Water recycling techniques feasibility and consequences
Readings	• United Nations Development Programme (2007) *Fighting Climate Change: Human Solidarity in a Divided World: Human Development Report 2007-2008*, Palgrave Macmillan, Basingstoke, UK. • *Layperson's Guide to Water Recycling and Reuse*, published in 1992 by the Water Education Foundation, Sacramento, California. • Video, entitled *Water from Water: Recycling*, produced in 1995 by National Water Research Institute, Fountain Valley, California. • Research On Recycled Water is done by EPA through the Office of Research and Development. • Water Recycling and Reuse: The Environmental Benefits http://www.epa.gov/region9/water/recycling/
Activity	**Overview** **Students are to plan and implement three-sessions workshop on the following themes:** • Water management (concepts; national and international models) • Water recycling techniques feasibility and consequences

Geography of Development

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
355. Environmental awareness 356. Weather and climate 357. Climate change and livelihoods 358. Climate change communication 359. Fairness and climate change justice 360. Future climate change scenarios 361. Anticipation and monitoring 362. Climate change policy 363. Climate change	504. Adaptive learning and self-reflection; 505. Awareness and advocacy raising 506. Carbon literacy for procurement 507. Contextualising 508. Critical, systemic and futures thinking 509. Debating 510. Discourse 511. Futures thinking 512. Global dynamics 513. Integrated assessment 514. Leadership	583. Accountability 584. Confident 585. Decisive 586. Democratic 587. Empathy 588. Environmental justice 589. Gender-sensitive 590. Global mind-set/ consciousness 591. Interdependency 592. Nonviolence & peace 593. Openness to novelty and change	11. Critically assess the role of governments, international agencies, private actors and NGO's with regard to poverty and development. 12. Critically examine the central concepts underlying development theory and relate them to wider issues of how local societies conceive their long-term sustainability and well-being. 13. Identify how debates and concepts in the field of development geography are being translated in development policies and practice. 14. Discuss certain thematic fields within the human geography of developing countries. 15. Explain the major theories of development and underdevelopment.

adaptation 364. Risk assessment 365. Environmental economics 366. Environmental law 367. Environment and governance 368. Economics and growth 369. Environmental awareness 370. GIS: geographic information systems	515. Local knowledge 516. Mapping gender impacts 517. Motivate and manage change 518. Networked learning 519. Prioritising 520. Problem solving 521. Resolve ethical dilemmas 522. Scenario analysis and planning 523. Team management	594. Optimism 595. Organised 596. Respect and care for the community 597. Respect for diversity 598. Social cohesion 599. Social responsibility 600. Stewardship 601. Tolerance 602. Transparency 603. Virtue	

Course Syllabus

Course Number:

Geography of Development

University of Port Said, Faculty of Arts, Department of Geography,

2013-2014

Instructor Information

Instructor: Dr
Office Location: Faculty of Arts Campus
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Geography of Development**

Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course provides students with an overview of ideas and themes in development with a particular emphasis on what it means to understand it in terms of geography. It seeks to help students understand both the geographical causes and consequences of varying development. Studies compare More Economically Developed Countries (MEDCs) with Less Economically Developed Countries (LEDCs). Within development geography, sustainable development is also studied in an attempt to understand how to meet the needs of the present without compromising the needs of future generations to meet their own needs. In addition, it explores that 'thinking geographically' about development involves understanding how the meaning of places and regions are socially constructed, and how theoretical and conceptual frameworks about development have been debated. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is they are asked to read and summarize articles on geography of development.

Course Learning Objectives

The overarching goals of this course are: a) to provide a critical approach to the thematic fields within the human geography of developing countries– at local, national and international scales; b) raise awareness of the role of the learners to reflect critically the major theories of development and underdevelopment; and c) use traditional and electronic resources as well as social networking technologies as tools to identify geographical causes and consequences of varying development.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

16. Critically assess the role of governments, international agencies, private actors and NGO's with regard to poverty and development.

17. Critically examine the central concepts underlying development theory and relate them to wider issues of how local societies conceive their long-term sustainability and well-being.
18. Identify how debates and concepts in the field of development geography are being translated in development policies and practice.
19. Discuss certain thematic fields within the human geography of developing countries.
20. Explain the major theories of development and underdevelopment.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		The definition of development, the major theories of development and underdevelopment.
3		The evolution of global inequalities
4		The impacts of population growth and migration, the role of agriculture, industry, and transportation in the development
6		Resource availability and use, pollution of air, water, and biosphere, energy problems.
7		Interactions of humans with plant and animal communities

Geography of Climate

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
371. Environmental awareness 372. Climate change communication 373. Fairness and climate change justice 374. Future climate change scenarios 375. Technology and innovation 376. Climate change implications for integrated coastal planning 377. Risk assessment 378. Climate variability 379. Climate change communication 380. Climate change and health 381. Strategic planning and climate change 382. Role of international institutions 383. Climate change: Science, impacts &	524. Adaptive learning and self-reflection; 525. Awareness and advocacy raising 526. Communicating 527. Contextualising 528. Critical, systemic and futures thinking 529. Debating 530. Discourse 531. Futures thinking 532. Integrated assessment 533. Leadership 534. Local knowledge 535. Motivate and manage change 536. Networked learning 537. Prioritising 538. Problem solving 539. Resolve ethical dilemmas 540. Scenario analysis and planning 541. Team management	604. Accountability 605. Confident 606. Decisive 607. Democratic 608. Empathy 609. Environmental justice 610. Openness to novelty and change 611. Optimism 612. Organised 613. Respect and care for the community 614. Respect for diversity 615. Social responsibility 616. Transparency 617. Sense of urgency 618. Human wellbeing 619. Human rights 620. Social responsibility 621. Perspective 622. Co-responsibility	1. Identify the geographic distributions of climate processes such as temperature, precipitation, and weather. 2. Explain the processes that determine global climate patterns. 3. Interpret weather maps and data. 4. Analyze the causes and explain the implications of global warming. 5- Identify the elements of the climate and the factors affecting it. 7- Identify the elements of the climate on the maps using the suitable symbols. 8- Discuss the concepts of atmospheric disturbances, hurricanes, and how they occur and geographically spread.

scenarios 384. Future climate change scenarios		623. Systematic 624. Focussed	

Course Syllabus

Course Number:

Geography of Climate

Port Said University, Faculty of Arts, Department of Geography, Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of Arts
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Geography of Climate**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to provide students with the key concepts about the geography and climate, the important elements of climate and how they are measured and recorded and handled statistically. It also illustrates the importance of the gaseous envelope of the planet and the threats it faces and how protect it. It familiarizes student elements of the climate and the factors affecting it and its geographical distribution and the skillful representation of the elements of the climate on the maps using the suitable symbols. Students are asked to read and summarize articles on elements of the climate. In short, the course provides an appropriate chance for the students to get the minimum knowledge of the climate processes and elements.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of geography of climate ; b) to raise awareness of the learners about elements of the climate and the factors affecting it; c) and help learners use traditional and electronic tools to identify the the elements of the climate on the maps using the suitable symbols.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify the geographic distributions of climate processes such as temperature, precipitation, and weather.
2. Explain the processes that determine global climate patterns.
3. Interpret weather maps and data.
4. Analyze the causes and explain the implications of global warming.
5- Identify the elements of the climate and the factors affecting it.
7- Identify the elements of the climate on the maps using the suitable symbols.
8- Discuss the concepts of atmospheric disturbances, hurricanes, and how they occur and geographically spread.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

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Course Policies

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Classroom Protocol

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Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Introduction of climate science and its relation with the other sciences .
3		The concept of systems and models in weather and climate
4		Elements of climate.
5		*Components and Characteristics* of the Earth's *Atmosphere*
6		Research Design Methods.

APENDIX I
Course Syllabus Adult education and environment work

Instructor Information
Instructor: Abd El Hay A. Mahmoud, Associate Prof.
Office Location: Psychology Dept.Faulty of Education

Office: ***Second floor, Main Building***
Telephone: ***Office +20 973481533***
Office Hours:
Cell: +201148685684
Sunday 12.30-4.00 pm, Wednesday 12.30 – 4.00 pm.

Email: ***agaderabdelhay@yahoo.com***

Website:

Course Identification
Course Number: ***312 T.R***
Course Name: ***Adult education and environment work***
Course Location: ***Faulty of Education, Class Building***
Class Times: ***10:00 – 12:00 pm, Saturday***
Faculty Web Page: *http://edu.aswu.edu.eg*

Course Description:

Adult education and environment work is a science, which aims to give a general idea about the importance of adult education and literacy as a requirement necessary for the development of society, especially in the current era, which is characterized as the era of knowledge. Adult environmental education can play an important role in sensitizing and mobilizing communities and decision-makers towards sustained environmental action. Environment, health, population, nutrition and food security are intricately linked to one another in sustaining development. Each is a complex issue. Caring for the environment by controlling pollution , preventing soil erosion and prudently managing natural resources has a direct impact on the population's health, nutrition and wellbeing which, in turn, have implications for population growth and the availability of food. These issues are part of the wider quest for sustainable development, which cannot be attained without a strong emphasis in education on family issues, the reproductive life cycle and population issues such as ageing, migration, urbanization, and intergenerational and family relations.

Course Learning Objectives:

- ***Knowledge of the concept of the environment and its relationship to humans and Adult.***
- ***The impact of Adult education on environment work .***
- ***Concludes the effect of environment work functions, and the performance of mental tasks .***
- ***Determine the relationship of Adult education and environment work.***
- ***Concludes the optimal form of the environment work and how to deal with it.***

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. ***Congestion and its impact on behavior and associated pressures.***
2. ***Adult education and environment work and the resulting affect the physiological functions, and perform mental tasks and psychological aspects.***
3. ***Adult education and environment work in terms of their relationship with the various functions on the human.***
4. ***Identify environmental problems of society.***
5. ***Learn practical ways to solve the environmental problems of society.***
6. ***Dealing good with the components of the environment.***

Required Course Texts and Materials:
Reference textbook for this course are:

- ***Abdel Fattah Dwedar (2010) Environmental Psychology. Alexandria: House new knowledge***
- ***SayedFahmi Ali (2005) Environmental Psychology. Alexandria: House new knowledge.***
- ***Contributions to psychology in solving the environmental problems of the environment and promotion of at*** *http://www.greenline.com.kw/ArticleDetails.aspx?tp=358*
- ***Abdul Rahman Mohammed Essawi (1997): in environmental psychology. Alexandria: plant knowledge***

In addition, selected publications in the fields relevant to the topics will be reviews and discussed extensively.

Assignments and Grading Scheme

Grading System
0 to 50 (where 25 is the least pass mark)

Grading Policy

Assignments	***10%***
Exams	***80%***
Class attendance/participation	***10%***
Total Points	***100***

Course Schedule

Week	*Date*	*Topics*
1		*Discussion of syllabus, assignments, and course requirements.*
2		*Knowledge of the concept of the environment and its relationship to adult and the interaction between them*
3		*The surrounding environment*
4		*The Adult education and environment work.*
5		*Adult education effects of environment work.*
6		*Ways to deal with environmental problems.*

APENDIX I:

Course Number:

Community health

University of Aswan, Faculty of social work, Department of social planning,

Spring Semester, 2013-2014

Instructor Information

Instructor: Dr Modather Seleem

Office Location: Aswan University Campus

Telephone: Office 002 097 0380336

Office Hours: Monday 14.30- 17.00, Thursday 14.00 – 16.00
E-mail: bosy52@yahoo.com
Website:

Course Identification

Course Number:
Course Name: Community health
Course Location: University Campus
Class Times: Wednesday 9:30pm – 12:30am
Prerequisites: accepted in the first year in social work faculty
Faculty Web Page: http://sworks.aswu.edu.eg/Arabic/Pages/default.aspx

Community health care approach to the deployment of health education and awareness about health and social problems prevailing in the community and work to put the appropriate methods to control and eliminate the participation of the community. Through health education and urged the people to embrace the lifestyle and practices of permanent health is specialized to change the views of the individual and society and their behaviour to improve the level of health, and the health of the people should be their responsibility to themselves and the war against diseases for health can not be fought by doctors only, but the battle of the people that must be waged by peoples collectively, which underlines the need for active participation of citizens and for the mutual benefit between the doctor and the community.

The community health approach on three key objectives of: The acquisition of health information. Urged the people to change the erroneous concepts of health. Directing the community to follow proper health behaviour. The approach addresses the health of the community the following sections: Identify the concept of health and disease, and multiple diseases, and the health system in the Egyptian society, and the impact of climate change on the health of individuals and the community and Social Work posts in the face of different diseases and spread awareness among residents of the community.

Course Learning Objectives

The overarching goals of this course are:

1 - Development of awareness among members of the community of the importance of health awareness and prevention of different diseases that affect the general health of the individual and society.

2 - To identify the posts in the community to provide access to appropriate care for members of the community so as to maintain the human entity and achieve growth and stability.

3 - Increase awareness among members of the community and how different diseases take appropriate measures to maintain the health of those human diseases.

4- Understand the impact of climate change on human health and the community and how to keep pace with changes including multiple does not affect human health..

5- Clarify the roles of social Work in health awareness and develop the capacity of members of the community to cope with multiple health problems

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

6. The acquisition of information about the overall health of the individual and society.
7. Learn the basics of primary health care for the individual and society.
8. Knowledge of the most important health problems and diseases suffered by members of the community.
9. The study of the environment changes and different climate and its impact on the health of the individual and society.
10. To identify the contribution of social service in spreading health awareness among members of the community.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

رشاد أحمد عبد اللطيف: الخدمة الاجتماعية البيئية, (القاهرة, بدون، 1998)

جمال شحاتة حبيب: المفاهيم البيئية، فى جمال شحاتة وآخرون: "الإنسان والبيئة فى إطار مهنة الخدمة الاجتماعية"، (القاهرة: بل برنت للطباعة والتصوير، 1996)

أحمد محمد السنهورى، طه عبد العزيز الديب: الخدمة الاجتماعية في مجال حماية البيئة والسكان من التلوث (القاهرة, مركز الكتاب بجامعة حلوان ، 1986)

محمد يسرى دعبس: تلوث البيئة وتحديات البقاء، رؤية انثروبولوجية, (الإسكندرية, بدون، 1997) ص ص25–26.

محمد منير حجاب : التلوث وحماية البيئة، قضايا البيئة من منظور إسلامي، ط1, (القاهرة, دار الفجر للنشر والتوزيع، 1999)

أسامة الخولي : البيئة وقضايا التنمية والتصنيع ,سلسلة عالم المعرفة,العدد 285, (الكويت, المجلس الوطني للثقافة والفنون والآداب,2002)

Sines, D., Appleby, F. M., & Frost, M. (2005). Community health care nursing (3rd ed.). Oxford, UK ; Malden, MA: Blackwell Pub.

Wakerly, R. T., & First Consulting Group. (1994). Community health information networks : creating the health care data highway. Chicago: American Hospital Pub.

Holzemer, S. P., & Klainberg, M. B. (2014). Community health nursing : an alliance for health (2nd ed.). Burlington, MA: Jones & Bartlett Learning.

Bensley, R. J., & Brookins-Fisher, J. (2009). Community health education methods : a practical guide (3rd. ed.). Sudbury, Mass.: Jones and Bartlett Publishers.

Cropper, S. (2007). Community health and wellbeing : action research on health inequalities. Bristol, UK: Policy Press.

Minkler, M., & Wallerstein, N. (2003). Community based participatory research for health. San Francisco, CA: Jossey-Bass.

http://health.jbpub.com/communityhealth/7e/

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	15/2/2012	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	22/2	Introduction to Community Health
3	29/2	Healthcare in the community
4	7/3	Community Health Assessment
5	14/3	Race, Ethnicity and Health
6	21/3	Issues in Global Health
7	28/3	Community Health Program Planning
8	4/4	Women and Health
9	25/4	Health Ethics and Policy

10	2/5	Community Action in Public Health
11	9/5	Psychoactive Drugs: Issues, Policies, and Intervention
12		Public Health in the Global Economy
13		Social Networks and Social Support
14		climate change in the community health

APENDIX I:

Course Number:

Introduction to Social planning

University of Aswan, Faculty of social work, Department of social planning,

Spring Semester, 2013-2014

Instructor Information

Instructor: Dr. Kawther Kenawy

Office Location: Aswan University Campus
Telephone: Office 002 097 0380733
Office Hours: Wednesday 14.30- 17.00, Monday 14.00 – 16.00
E-mail: kelqenawi@aswu.edu.eg
Website:

Course Identification

Course Number:
Course Name: Introduction to Social planning
Course Location: University Campus
Class Times: Thursday 9:30pm – 12:30am
Prerequisites: accepted in the first year in social work faculty
Faculty Web Page: http://sworks.aswu.edu.eg/Arabic/Pages/default.aspx

Course Description/Overview

Planners often have the challenge of serving the "public". How can a planner best serve a public which has diverse needs and values based on age, gender, ethnicity and cultural background? In addition, how do planners trained in land use planning account for and address social issues such as homelessness, housing affordability, environmental racism and the increased privatization of space? While social planning was an important and central focus of the urban planning discipline in the 1970's, today it is barely mentioned or studied within academia or at the local and regional level. Yet, social issues and challenges are just as prevalent today. Our urban communities continue to face the challenging issues of homelessness, affordable housing, and environmental justice. In addition, our populous has become more diverse spanning a wide variety of cultures and backgrounds, each bringing a distinctive set of perspectives and needs. Social planning is the practice of identifying and addressing the needs of various segments of the population to ensure that all have an equal opportunity to both change their environment and benefit from it. The purpose of this course is to analyze social planning theory and practice at the local, regional and national level. This course will also entail a contemporary study of social issues and problems

commonly encountered in an urban environment and how they're integrated into and addressed through the practice of land use planning. Included subjects of discussion and analysis
shall include: planning theory, planning for age (young and elderly), gender, race, and plan implementation.

Course Learning Objectives

The overarching goals of this course are: a) to Incorporate the knowledge of different planning theories and paradigms in approaching the urban planning process, be able to identify how the plan-making (comprehensive planning) process accounts for differences in society; b) Identify different segments of the population differentiated by race, age, and gender and their distinctive needs and concerns with respect to living and working in the urban environment.; c) Evaluate development plans and general plans with a critical eye to identify how they have accounted for the distinctive needs of different segments of the public, distinguished by age, race, and gender ;d) Prepare development plans and general plans incorporating a plan making process that accounts for and incorporates the needs of different segments of the population ;e) Find resources to develop solutions to social issues or problems, and an aptitude to plan an appropriate solution with tangible results ;f) Find resources to develop solutions to the issues and problems of climate change.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Incorporate the knowledge of different planning theories and paradigms in approaching the urban planning process, be able to identify how the plan-making (comprehensive planning) process accounts for differences in society.
2. Identify different segments of the population differentiated by race, age, and gender and their distinctive needs and concerns with respect to living and working in the urban environment.
3. Evaluate development plans and general plans with a critical eye to identify how they have accounted for the distinctive needs of different segments of the public, distinguished by age, race, and gender.
4. Prepare development plans and general plans incorporating a plan making process that accounts for and incorporates the needs of different segments of the population.
5. Find resources to develop solutions to social issues or problems, and an aptitude to plan an

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

طلعت مصطفي السروجي: ثلاثية التنمية البشرية و نوعية الحياة والتحديث"كمدخل لإستراتيجية والية التخطيط الاجتماعي ، بحث منشور في المؤتمر العلمي الرابع عشر , كلية الخدمة الاجتماعية بالفيوم , جامعة القاهرة , مايو 2003.

مني عويس، عبلة الافندي :التخطيط للتنمية الاجتماعية ,مكتبة النهضة المصرية , القاهرة ,1997.

Fulton, William. “Introduction: How Planning in California Really Works” in Guide to California Planning. Chapter 1, 2005.
Levy, John M. “The Social Issues” in Contemporary Land Use Planning, 9th Edition.
2011

Hays, Samuel & Broughton, Samuel. The progressives and the slums; tenement house
reform in New York City, 1890-1917. Chapter 8. 1962

Jacobs, Jane. “The Death and Life of Great American Cities”. Readings in Planning
Theory, Chapter 2. 2003.

Sandercock, Leonie “The Difference that Theory Makes” in Towards Cosmopolis:
Planning for Multicultural Cities. Chapter 4. 1998.

Checkoway, Barry “Paul Davidoff and Advocacy Planning in Retrospect” and Clavel,
Pierre “The Evolution of Advocacy Planning” both in Journal of the American Planning Association; Spring 1994. Vol. 60, No. 2.

Innes, Judith E. & Booher, David E. “Collaborative Policy Making: Governance Through Dialogue,” Chapter 1 in Deliberative Policy Analysis: Understanding Governance in the Network Society, Hajer, Maarten and Hendrik Wagenaar eds., Cambridge University Press. 2003.

Andrews, James H “Leisure Power” in Planning (Nov 1999): p4

Howe, Deborah et. all, Planning for an Aging Society Planning Advisory Service Report Number 451. 1994. Chapters 1-3

Multigenerational Planning: Family Friendly Communities Briefing Papers – American Planning Association. 2011

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course

		modules)
1	15/2/2012	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	22/2	Introduction
3	29/2	What is Social Planning?
4	7/3	History of Social Planning
5	14/3	Social Planning Theory
6	21/3	Planning / Design
7	28/3	Social Planning Issues - Homelessness
8	4/4	Social Planning Issues- Affordable Housing
9	25/4	Social Planning Issues- Environmental Justice
10	2/5	Social Planning Issues– climate change
11	9/5	Sustain policy and social planning for climate change

APENDIX I:

Course Number:

Introduction to Social Welfare

University of Aswan, Faculty of social work, Department of community organization,

Spring Semester, 2013-2014

Instructor Information

Instructor:	Dr. Mohamed Gaber Abaas
Office Location:	Aswan University Campus
Telephone:	Office 002 097 03841212
Office Hours:	Sunday 14.30- 17.00, Monday 14.00 – 16.00
E-mail:	m.g.abaas@aswu.edu.eg
Website:	

Course Identification

Course Number:	
Course Name:	Introduction to Social Welfare
Course Location:	University Campus
Class Times:	Wednesday 9:30pm – 12:30am
Prerequisites:	accepted in the first year in social work faculty

Faculty Web Page: http://sworks.aswu.edu.eg/Arabic/Pages/default.aspx

Course Description/Overview

This course surveys the history of social welfare , services, and the relation between social work and social welfare.It explores current social welfare issues in the context of their history and the underlying rationale and values that support different approaches. The course considers implicit and explicit values of societal responses to human needs. From an examination of selected topics in social welfare, the course considers social, economic, ethical, religious, and/or personal values as they affect and are affected by social welfare. The first section addresses the basics of social welfare such as concepts, goals, philosophy, principles, functions, directions, fields . The second section discusses the social welfare in the great civilizations such as ancient Egypt, grace, roman. The third section focuses on social welfare in religious specially in the Islam. The fourth section discusses the social welfare around the world. The five section addresses social welfare in the Egyptian society , The sex section addresses the relation between social work and social welfare, The seven section discusses the social welfare under the climate change, which changed in the programs and services.

Course Learning Objectives

The overarching goals of this course are: a) to provide a description of the historical basis for the current social welfare system, including the history and role of the social work profession; b) Discuss the strengths and limitations of the current social welfare system in terms of the functions of the provision of basic needs, protection of the vulnerable, prevention, promotion, treatment, rehabilitation, protection of society, and provision of social control; c) raise awareness of the major fields of social welfare service provision from a multicultural perspective, including but not limited to income security, health and mental health services, child welfare, educational practices, services to the elderly, and corrections ;d) analyze current debates, trends, and ethical issues in each specific field of service presented in the course including the implications for social welfare practice and promoting social policies in the field of climate change.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Discuss the various basics of social welfare such as concepts, goals, philosophy, principles, functions, directions, fields .

2. make great knowledge about social welfare in the great civilizations such as ancient Egypt, grace, roman, and in the religious specially in the Islam. social welfare around the world.social welfare in the Egyptian society.
3. Discuss the relation between social work and social welfare,
4. Demonstrate awareness and ability to work in the social welfare under the climate change .

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

بدر الدين كمال و محمد جابر عباس (2012). مقدمة في الرعاية الاجتماعية,القاهرة, دار النهضة المصرية

عبد الحليم رضا عبد العال وآخرون .(2000).الرعاية الاجتماعية في الخدمة الاجتماعية, القاهرة :قسم تنظيم المجتمع كلية الخدمة الاجتماعية جامعة حلوان.

ماهر أبو المعاطي علي.(2009).الاتجاهات الحديثة في الرعاية الاجتماعية ,الإسكندرية:المكتب الجامعي الحديث.
محمد سيد فهمي.(2008).الرعاية الاجتماعية بين حقوق الإنسان وخصخصة الخدمات, الإسكندرية:دار الوفاء لدنيا الطباعة والنشر.

محمد عبد الفتاح محمد , أميرة منصور يوسف.(1994). الأسس النظرية للرعاية الاجتماعية, الإسكندرية:المكتب العلمي للكمبيوتر والنشر والتوزيع.

نبيل محمد صادق وآخرون.(2007).رؤي نظرية في الرعاية الاجتماعية " أسس ونماذج عربية ومصرية",القاهرة ,دار المهندس للطباعة.

Blau, J., & Abramovitz, M. (2004). The Dynamics of Social Welfare Policy: Oxford University Press.

Midgley, J. (1997). Social Welfare in Global Context: SAGE Publications.

Patti, R. J. (2000). The Handbook of Social Welfare Management: SAGE Publications.

Olsson, T. M. (2010). Comparing top-down and bottom-up costing approaches for economic evaluation within social welfare. Eur J Health Econ.

Ambrosino, R. (2008). Social work and social welfare : an introduction (6th ed.). Belmont, CA: Thomson Brooks/Cole.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course

		modules)
1	15/2/2012	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	22/2	basics of social welfare such as (1) concepts, goals, philosophy,
3	29/2	basics of social welfare such as (2) principles, funct directions, fields
4	7/3	social welfare in the ancient Egypt
5	14/3	social welfare in the great civilizations such asgrace, roman
6	21/3	social welfare in religious
7	28/3	social welfare in Islam
8	4/4	social welfare around the world
9	25/4	social welfare in the Egyptian society
10	2/5	the relation between social work and social welfare
11	9/5	social welfare under the climate change

APENDIX I:

Course Number:

Populations and Environmental Studies

University of Aswan, Faculty of social work, Department of social planning,

Spring Semester, 2013-2014

Instructor Information

Instructor: Dr. Mohamded Abdel- Razik
Dr. Mohamed Sayed

Office Location: Aswan University Campus

Telephone: Office 002 097 0380733

Office Hours: Wednesday 14.30- 17.00, Monday 14.00 – 16.00

E-mail: dr.mohamed99990@hotmail.com and acd99990@aswu.edu.eg

Website:

Course Identification

Course Number:

Course Name: Populations and Environmental Studies

Course Location: University Campus

Class Times:	Thursday 9:30pm – 12:30am
Prerequisites:	accepted in the first year in social work faculty
Faculty Web Page:	http://sworks.aswu.edu.eg/Arabic/Pages/default.aspx

Course Description/Overview

Environment is the framework in which they live rights and gets him on the elements of his life, food, clothing, medicine, shelter and exercise their relationships with peers, and in light of this sense, the environment is not just the natural elements (water, air, soil, minerals, plants, animals and energy sources) but they are also the balance of material resources and social available at some time, and somewhere to satisfy human needs and aspirations, and this we will address this decision (environmental studies and population) through the following sections: the first section addresses the definition of the environment and its characteristics, the second section deals with identifying the relationship between man and the environment and environmental problems and ways to address those problems , and Your first category III deals with the study of environmental pollutants and how to combat these pollutants and the fourth section addresses the role of social Work and tread different in the face of environmental problems, and the fifth section deals with the study of population and demographic characteristics of the population as well as to identify the problems of population and ways to address them, in addition to the study of the various factors that affect the environment The population in the light of climate change in order to achieve sustainable development and contribute to the achievement of stability within the different communities.

Course Learning Objectives

The overarching goals of this course are:

1 - Development of awareness of the importance the study of environmental problems and work to find the appropriate solutions in the light of environmental standards, which would contribute to the stability and sustainable development and cope with various changes.

2 - Improve the relationship between man and the environment surrounding it through the best investment of resources and facilities available, including not affect the natural environment and to achieve development and maintains the ecological balance and environmental components.

3 - Development of awareness of the importance of studying the problems of population and work on investment of human resources in order to achieve stability and contribute to the development of communities under various changes and scientific progress.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify the characteristics of the environment and natural components and the mutual influence between living and non-living .
2. Discuss the relationship between man and the environment and the impact of human environmental factors.
3. Identify the various environmental problems and how to address them and work to achieve ecological balance between man and the environment surrounding it.
4. Identify the types of environmental pollutants and its impact on human life and the ways to combat these pollutants. Develop a lesson plan that integrates the produced digital artefact.
5. Identify the demographics of the community and address the problems of the mechanics of the population increase.
6. Discuss methods of investment of human resources to achieve growth and sustainable development.
7. Display some videos related to environmental problems and population.
8. Recognize the contribution of social work in the face of environmental problems and population and to help achieve stability within communities

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

نهى الخطيب : اقتصاديات البيئة والتنمية , سلسلة أوراق غير دورية(القاهرة , دار غريب,2000)

محمد نجيب توفيق : الخدمة الاجتماعية فى مجال حماية البيئة من التلوث, (القاهرة ,مركز الكتاب بجامعة حلوان ، 1988)

إبراهيم بيومى مرعى، جمال شحاتة حبيب: الخدمة الاجتماعية والتحديات البيئية،(جامعة القاهرة, كلية الخدمة الاجتماعية فرع الفيوم, المؤتمر العلمي العاشر ، 1997)

إبراهيم بيومى مرعى، ملاك أحمد الرشيدى: دراسات بيئية من منظور الخدمة الاجتماعية، (القاهرة, مركز نور الإيمان، 1999)

محمد عامر أبو المجد: دور الخدمة الاجتماعية فى حماية البيئة، (الإسكندرية, دار المعرفة الجامعية، 1996)

علي عبدالرزاق جلبي، 1998 ، علم اجتماع سكان، دار المعرفة الجامعية، الاسكندرية.

عبدالله الخريجي ومحمد الجوهري. 1979. مقدمة في السكان . دار الشروق، جده

فتحي ابو عيانه .1985، دراسات في علم السكان، دار النهضة العربية، بيروت

Fulton, William. “Introduction: How Planning in California Really Works” in Guide to California Planning. Chapter 1, 2005.

http://www.springer.com/social+sciences/population+studies/journal/11111

https://www.springer.com/?SGWID=0-102-2060-0-0

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave

early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	15/2/2012	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	22/2	the definition of the environment and its characteristics
3	29/2	identifying the relationship between man and the environment
4	7/3	identifying the relationship between environmental problems and ways to address those problems ,
5	14/3	the study of environmental pollutants

6	21/3	the study of how to combat these pollutants
7	28/3	role of social Work and tread different in the face of environmental problems
8	4/4	study of population and demographic characteristics of the population
9	25/4	identify the problems of population and ways to address them
10	2/5	study of the various factors that affect the environment
11	9/5	study of the various factors that affect the environment and The population in the light of climate change

APENDIX I:

Course Syllabus

Course Number:

Rural and Urban Sociology

University of Aswan, Faculty of social work, Department of Social planning,

Spring Semester, 2013-2014

Instructor Information

Instructor: Dr. Mohamed Nagdy Sayed

Office Location: Aswan University Campus

Telephone: Office 002 097 03840733

Office Hours: Monday 14.00- 16.30, Tuesday 14.00 – 16.00

E-mail: nagdy59@aswu.edu.eg

Website:

Course Identification

Course Number:

Course Name: Rural and Urban Sociology

Course Location: University Campus

Class Times: Thursday 9:30pm – 12:30am

Prerequisites: accepted in the first year in social work faculty

Faculty Web Page: http://sworks.aswu.edu.eg/Arabic/Pages/default.aspx

Course Description/Overview

The course aims to help students understand the rich diversity in rural society, with an emphasis on the interdependencies between urban and rural contexts. Current issues and social problems experienced by rural populations and how sociology is used to understand and address issues affecting rural communities are explored.

This course explores social life along the rural-urban continuum. We will examine differences and similarities in social behaviour, organization and ecology. An overview of social science perspectives pertaining to the interaction between human behaviour, social organization, and various dimensions of both natural and "built" environments will be provided. Upon developing a sociological understanding of rural, we will consider topical issues that often transcend the rural-urban continuum. In examining these and other related issues, Students completing the course should leave with an enhanced awareness of how humans interface with their environments, and why planned development efforts need to consider that interface in order to maximize the degree of congruence between environmental conditions and the needs and preferences of humans who live and work in those environments.

The first section addresses the concept of Sociology. The second section discusses the definitions of Rural and Urban Sociology. The third section focuses on historical background of Rural and Urban Sociology. The fourth section discusses the theories of Rural and Urban Sociology. The five section addresses scientific schools in Rural and Urban Sociology, The sex section addresses the how to work with Rural and Urban society , The seven section discusses the role of Rural and Urban Sociology in the facing the challenges of climate change.

Course Learning Objectives

The overarching goals of this course are: a) to provide a description of terminology and concepts used in the study of urban and rural sociology, including the Define concepts such as society/ civilization/ city/ suburb/ rural; b) Review the theoretical foundation of humans living in cities and villages; c) Discuss the failure of centrally planned totalitarian cities and villages ;d) Examine the social life in urban and rural spaces and the influence of the urban environment on human behaviour; e) Discuss city-living issues such as corrupt zoning, gerrymandering, red-lining, urban redevelopment, eminent domain for roads and highways, urban redevelopment, price fixing for rents and groceries, war against youth, over policing, under policing, climate change. etc

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. As a result of taking this course, students will have gained a social science understanding of rural and urban issues.
2. Students will be able to demonstrate critical thinking through oral and written formats, assess the complexity of rural and urban issues.
3. Students will be able to apply sociological theories and methodologies to the study of rural and urban issues.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

مسعد الفاروق محمد حمودة: تنمية المجتمعات المحلية "الريفية – الحضرية – المستحدثة – الصحراوية" ، المكتب العلمى للكمبيوتر والنشر والتوزيع، الاسكندرية ,1995.

حسين عبد الحميد احمد رشوان: مشكلات المدينة"دراسة في علم الاجتماع الحضري", مؤسسة شباب الجامعة, الاسكندرية, 2005.

jawharī, M., & Shukrī, A. (1980). **علم الاجتماع الريفي و الحضري :دار المعارف،.**

American Sociological Association Task Force on Assessing the Undergraduate Sociology Major. 2005. Creating an Effective Assessment Plan for the Sociology Major. Washington, DC: American Sociological Association.

Beaulieu, Lionel J. 2005. "Breaking Walls, Building Bridges: Expanding the Presence and Relevance of Rural Sociology." Rural Sociology 70(1):1–27.

Browne, W.P., J.R. Skees, L.E. Swanson, P.B. Thompson, and L.J. Unnevehr. 1992. "Never

confuse farming with Rural America" Pp. 17-35 in Sacred Cows and Hot Potatoes: Agrarian Myths in Agricultural Policy. Boulder, CO: Westview Press.
Fitchen, J.M. 1991. "What then is rural? Challenges to rural and community identity" Pp. 245-265 in Endangered Spaces, Enduring Places: Change, Identity, and Survival in Rural America. Boulder, CO: Westivew Press.
Gallardo, R. 2010. "Rural America in the 2000s: Population" The Daily Yonder accessed online at http://www.dailyyonder.com/rural-america-2000s-population/2010/07/12/2834
Johnson, K. 2003. "Unpredictable directions of rural population growth and migration" Pp. 19-42 in D. Brown and L. Swanson (eds.) Challenges for Rural America in the 21st Century. University Park, PA: Penn State University Press.

Bridger, J.C., A.E. Luloff, and R.S. Krannich. 2002. "Community change and community theory" Pp 9-21 in A.E. Luloff and R.S. Krannich (eds.) Persistence and Change in Rural Communities: A Fifty Year Follow-Up to Six Classic Studies. New York, NY: CABI Publishing
Wilkinson, K.P. 1991. "The community and rural well-being" Pp. 61-79 in The Community in Rural America. Middleton, WI: Social Ecology Press.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course

		modules)
1	15/2/2012	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	22/2	concept of Sociology
3	29/2	definitions of Rural and Urban Sociology
4	7/3	historical background of Rural and Urban Sociology
5	14/3	the theories of Rural Sociology
6	21/3	the theories of Urban Sociology
7	28/3	scientific schools in Rural Sociology
8	4/4	scientific schools in Urban Sociology
9	25/4	how to work with Rural and Urban society
10	2/5	the role of Rural and Urban Sociology in the facing the recent problems and issues
11	9/5	the role of Rural and Urban Sociology in the facing the challenges of climate change

APENDIX I:

Course Syllabus

Course Number:

Social work in one of the developed fields (environment)
University of Aswan, Faculty of social work, Department of social work fields,
Spring Semester, 2013-2014

Instructor Information

Instructor: Prof. Dr Ali Dandarawy
Office Location: Aswan University Campus
Telephone: Office 002 097 0380690
Office Hours: Sunday 14.30- 17.00, Monday 14.00 – 16.00
E-mail: Dandarawy318@hotmail.com
Website:

Course Identification

Course Number:
Course Name: Social work in one of the developed fields (environment)
Course Location: University Campus

Class Times:	Wednesday 9:30pm – 12:30am
Prerequisites:	accepted in the first year in social work faculty
Faculty Web Page:	http://sworks.aswu.edu.eg/Arabic/Pages/default.aspx

Course Description/Overview

This course covers the Social Work in the field of environment and sustainable development and to support community-based organizations working in the field of environment. And is aimed at addressing environmental issues and changes thereto affect the stability and hinder the growth, progress and sustainable development as the focus of this course to support community-based organizations working in the field of environmental protection and spread awareness among members of the community and support of volunteerism, which would contribute to the improvement of the environment and to achieve stability and desired progress and deals with this scheduled the following sections: the concept of Social Work in the field of environmental protection, the goals of Social Work in the field of environmental protection, Social Work posts in achieving social development, contributions to civil society organizations in the field of environmental protection. This course also addresses the issues of climate change and its impact on the albino and how to contribute to the growth of environmental commensurate with the requirements of climate change and sustainable development.

Course Learning Objectives

The overarching goals of this course are:

1 - Development of environmental awareness as one of the areas developed in the Social Work and determines the appropriate methods to protect the environment from multiple problems.

2 - Increasing the information associated with the protection of the environment and ways to optimize the investment environment of resources in order to achieve stability and sustainable development and caring members of society.

3 - To identify the contribution of civil society organizations in the field of environmental protection and the mechanisms to support those organizations to contribute to the achievement of stability and social development

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

11. The acquisition of information related to the field of protection of the environment and how to preserve the environment of the different climate changes.

12. To identify the organizations working in the field of environmental protection and the mechanics of working through those organizations to protect the environment.
13. To identify the contribution of social service in the field of environmental protection as one of the areas developed in the Social Work.
14. Identify the goals of Social Work in the field of environmental protection.
15. Identify mechanisms to support organizations working in the field of environmental protection and to stabilize the environment and sustainable development.
16. Determine the plans, programs and strategies appropriate to the development environment commensurate with the climate change and achieving environmental stability
17. A showcase of some of the experiences in the field of environmental protection and how to employ them in proportion to the different climate changes

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

محمد عامر أبو المجد: دور الخدمة الاجتماعية فى حماية البيئة، (الإسكندرية, دار المعرفة الجامعية، 1996)

رشاد أحمد عبد اللطيف: الخدمة الاجتماعية البيئية, (القاهرة, بدون، 1998)

جمال شحاتة حبيب: المفاهيم البيئية، فى جمال شحاتة وآخرون: "الإنسان والبيئة فى إطار مهنة الخدمة الاجتماعية"، (القاهرة: بل برنت للطباعة والتصوير، 1996)

أحمد محمد السنهورى، طه عبد العزيز الديب: الخدمة الاجتماعية فى مجال حماية البيئة والسكان من التلوث (القاهرة, مركز الكتاب بجامعة حلوان ، 1986)

Mel Grayhttp://www.amazon.com/Environmental-Social-Work-Mel-Gray/dp/0415678129 (Editor), John Coates (Editor), Tiani Hetheringto.( ). Environmental Social Work

Lena Dominelli.(2012). Green Social Work: From Environmental Crises to Environmental Justice

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course

		modules)
1	15/2/2012	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	22/2	Introduction the concept of Social Work in the field of environmental protection
3	29/2	Social Work posts in achieving social development
4	7/3	contributions to civil society organizations in the field of environmental protection.
5	14/3	Environmental Crises, Social Conflict and Mass Migrations
6	21/3	Interrogating World Views: From Unsustainable to Sustainable Ways of Reframing Peoples' Relationships to
7	28/3	Climate Change, Renewable Energy and Solving Social Problems
8	4/4	climate change and its impact on the environment
9	25/4	requirements of climate change and sustainable development.

Course Code: UNC012

History of Engineering and Energy
Aswan University, Faculty of Energy Engineering,
Fall Semester, 2013-2014

Instructor Information

Instructor: Dr. Mohamed Shaaban
Office Location: Faculty of Energy Engineering
Telephone: Office – +20 3481234
Office Hours: Sunday 11.00 - 14.00, Wednesday 11.00 – 14.00
E-mail: mshaban68@yahoo.com
Website:

Course Identification

Course Coder: UNC012
Level: 000
Course Name: Engineering and Energy History
Course Location: Faculty of Energy Engineering
Class Times: Sunday 9.00 - 11.00
Prerequisites: NA
Faculty Web Page: http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

History was quite impracticable, not only because of the enormous compression that would be necessary, but because the plan of the original did not lend itself to such treatment. The story of technological development was at every epoch closely related to the historical background. This course aims at being as much a technological history as a history of technology, and in pursuing this course we believe ourselves to be following an important modern trend.

Course Learning Objectives

Know the engineering history in different fields. Know the energy and different sources of it. Know different fields and different programs of engineering Know about the engineer jobs in different pogroms. Understand the engineering job ethics

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Demonstrate knowledge of role of engineering in development and establishment of civilization.
2- Demonstrate knowledge and understanding of engineering history in ancient time, middle ages and modern time.
3- Demonstrate knowledge of different engineering fields.
4- Demonstrate knowledge of different engineering programs.
5- Demonstrate knowledge and understanding of technology transfer, environmental, inventions and engineering ethics.
6- Understand the role of engineering in development and establishment of civilization.
7- Identify technology transfer, environmental & inventions and engineering ethics
8- Assess engineering history in ancient, middle and modern time.
9- Assess resources in engineering history
10- Deal with engineering history at various times
11- Demonstrate knowledge of the engineering ethics and ethical obligations about climate change effects.
12- Understand the historical technologies to face the climatic hazards

Course Resources

1- Chaaban, M. A., "History of Engineering and technology", Elslam Press, 1998

2- Singer, C. Holmyard, E. J. and Hill, A. R., History of Technology, Oxford university press, London, 1975

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following:

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	22/9/2013	Role of engineering in development
2	29/7	Establishment of civilization.
3	6/10	Engineering history in ancient time and middle ages.
4	13/10	Engineering history in modern time.
5	20/10	Engineering fields.
6	27/10	Engineering programs.
7	3/11	Technology transfer,
8	10/11	Midyear exam

9	17/11	Engineering ethics and ethical obligations about climate change effects.
10	24/11	Environmental and inventions
11	1/12	Resources in engineering history
12	8/12	Methods and tools used in engineering history
13	15/12	Technologies related to the climatic hazards
14	22/12	Final Exam

Course Code: UNC321

Project Management

Aswan University, Faculty of Energy Engineering, Departments of Mechanical Power Station and High Voltage Networks,

Spring Semester, 2013-2014

Instructor Information

Instructor: Prof. Dr. Muntasser Dwidar

Location: Faculty of Energy Engineering

Telephone: Office – +20 3481234
Office Hours: Monday 11.00 - 14.00, Thursday 11.00 – 14.00
E-mail: dewidar5@hotmail.com
Website:

Course Identification

Course Coder: UNC321
Level: 300
Course Name: Project management
Course Location: Faculty of Energy Engineering
Class Times: Wednesday 10.00 - 12.00
Prerequisites: NA
Faculty Web Page: http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

The project management is a process. It is an activity of planning, organizing, motivating, and controlling resources. It uses the procedures and protocols to achieve specific goals. A project is designed to produce a product or service. The management requires the development of distinct technical skills and management strategies.

Course Learning Objectives

Know the definitions used in project management. The project life cycle, Project stages, Relationships and responsibilities of the different project parties, Execution phase responsibilities, Productivity, Quality management. - Human Influences of projects: Upgrading, Development, Economic factors, Social factors, Cultural factors, Aesthetic factors, Hygienic and psychological factors. Types of projects: Urban planning projects (residential projects, tourism projects, commercial projects, public buildings…etc.). Infrastructure projects (electricity plants, water supply and sewage networks, road networks, railroad networks, reservoirs, dams…etc.). Different Industrial projects (textile factories, steel Industries, cement factories, carpet factories, ceramic factories, food factories, electrical appliances, car industries…etc.). Environmental impact of projects: Negative and positive impacts (direct and indirect). The assessment of projects-

both nationally and internationally- in order to avoid the negative consequences of projects on the environment. The approved rates and criteria for the compatibility of projects with environmental topics.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:
1- Define the definitions used in project management.
2- Understand the project life cycle
3- Understand the project stages, relationships and responsibilities.
4- Analyze execution phase responsibilities, productivity, and quality management.
5- Discuss the hhuman influences of projects: Upgrading,
6- Identify the types of projects.
7- Analyse the environmental impact of projects
8- Apply the approved rates and criteria for the compatibility of projects with environmental topics.

Course Resources

1- Gray, R. and Larson, K., Project Management: The Managerial Process, McGraw Hill, Irwin, New York, NY, 2002.
2- Harris, R. and McCaffer, D., Modern Construction Management, Black Well Science, London, U.K., 2002.

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following:

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	definitions used in project management
2	23/2	Relationships and responsibilities of the different project parties
3	2/3	The project life cycle and project stages
4	9/3	Execution phase responsibilities
5	16/3	Productivity
6	23/3	Quality management
7	30/3	Human Influences of projects
8	6/4	Midyear exam
9	27/4	Types of projects and urban planning projects
10	4/5	Infrastructure projects and Industrial projects
11	11/5	Environmental impact of projects
12	18/5	The assessment of projects
13	25/5	The approved rates and criteria for the compatibility of projects with environmental topics
14	1/6	Final Exam

Course Code: PCR123

Fundamentals of Thermodynamic

Aswan University, Faculty of Energy Engineering, Departments of Mechanical Power Station and High Voltage Networks,

Spring Semester, 2013-2014

Instructor Information

Instructor:	Dr. Waleed Abdel-Fadeel
Location:	Faculty of Energy Engineering
Telephone:	Office – +20 3481234
Office Hours:	Tuesday 11.00 - 14.00, Wednesday 11.00 – 14.00

E-mail: wfadeel@yahoo.com
Website:

Course Identification

Course Coder:	PCR123
Level:	100
Course Name:	Thermodynamic Fundamentals
Course Location:	Faculty of Energy Engineering
Class Times:	Thursday 9.00 - 11.00
Prerequisites:	NA
Faculty Web Page:	http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

The subject of thermodynamics referred to as thermal science. It is of interest to students of all engineering branches, in fact to all mankind, as it deals with the most basic processes occurring in nature. The subject forms the basis for the study of a vast variety of devices such as refrigerators, air conditioners, automotive engines, aircrafts, locomotives, power plants, etc, the use of which is involved in the everyday life of almost every individual. Even the simple kitchen gadget of steam pressure cooker is designed on the basis of the principles of thermodynamics.

Course Learning Objectives

Demonstrate knowledge of basic thermodynamic concepts, ideal gases and pure substance, first low of thermodynamic on different systems. Apply the first law of thermodynamics on various engineering applications. Share ideas and work in a team in an efficient and effective manner under controlled supervision or independently.

Course Content Learning Outcomes

1- Understand the links between sustainability, carbon and climate change.
2- Define the concept of the energy.

2- Define the different basic concepts like properties, state, process, equilibrium, and cycles.
3- Develop students' understanding of the natural carbon cycle.
4- Identify the different between the ideal gases and the pure substance.
5- Understand the property relations relevant to engineering thermodynamics.
6- Understand how to deal with thermodynamic tables.
7- Identify the concept of work and heat.
8- Understand the first law of thermodynamics, internal energy and enthalpy and Steady state steady flow.
9- Apply the first law of thermodynamics.
10- Understand the ssecond law of thermodynamics.
11- Understand the vapour and gas cycles

Course Resources

1- Sonntag, R. E.; Borgnakke, C. and Van Wylen, G. J., Fundamentals of thermodynamics, John Wiley and Sons Inc., 1998.
2- Cengel, Y. A. and M. A., Thermodynamics: An Engineering Approach, WCB/McGraw Hill, 1998

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following:

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	Basic concepts and definitions, the links between sustainability, carbon and climate change.
2	23/2	System and control volume, Property and state
3	2/3	Processes and cycles, natural carbon cycle.
4	9/3	Work definition, Definition of heat transfer
5	16/3	Ideal gases, State equation, Specific heat at constant pressure and volume
6	23/3	Pure substances and phase equilibrium, Tables of thermodynamic properties
7	30/3	First law of thermodynamics, Internal energy and enthalpy
8	6/4	Midyear exam
9	27/4	First law for closed cycle
10	4/5	Closed and open systems: Steady flow and uniform state uniform flow
11	11/5	Application of first law of thermodynamics (reciprocating compressors)
12	18/5	Second law of thermodynamics
13	25/5	Vapour and gas cycles
14	1/6	Final Exam

Course Code: ENN223

Energy Conversion and Utilization

Aswan University, Faculty of Energy Engineering, Departments of Mechanical Power Station and High Voltage Networks,

Spring Semester, 2013-2014

Instructor Information

Instructor: Dr. Ezzat Gad
Location: Faculty of Energy Engineering
Telephone: Office – +20 3481234
Office Hours: Monday 12.00 - 14.00, Wednesday 10.00 – 14.00
E-mail: gadelseed@msn.com
Website:

Course Identification

Course Coder: ENN223
Level: 200
Course Name: Energy conversion and utilization
Course Location: Faculty of Energy Engineering
Class Times: Monday 9.00 - 12.00

Prerequisites: NA

Faculty Web Page: http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

The purpose of this course is to critically examine the technology of energy systems that will be acceptable in a world faced with global warming, local pollution, and declining supplies of oil. The focus is on renewable energy sources (wind, solar, biomass), but other non-carbon emitting sources (nuclear) and reduced carbon sources (co-generative gas turbine plants, fuel cells) are also studied. Both the devices and the overall systems are analysed.

Course Learning Objectives

Introduction to principles, theories and processes of devices and systems that convert thermal, chemical, nuclear, and electromagnetic energy to electrical, mechanical and alternative chemical form. Energy conversion performance characteristics and sources of inefficiencies are explored for a variety of applications that include conventional fossil energy combustion based systems, nuclear, solar, wind, wave, biomass, thermoelectric, and geothermal energy systems.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Demonstrate knowledge of energy conversion.
2- Study the future energy systems (e.g. pollution, climate change, energy security).
3- Compare between fuels and cycle analysis.
4- Understand the nuclear reaction physics and reactor designs.
5- Discuss the nuclear waste disposal.
6- Understand the solar-thermal energy.
7- Apply the conversion for heating systems.
8- Identify the photovoltaic technology.
9- Identify the wind energy.
10- Identify the geothermal and ocean current Energy.
11- Identify the biomass and waste to energy.
12- Apply the electro-chemical conversion.

13- Apply the thermoelectric conversion.
14- Know the climate Control, CO2 Sequestration and Energy Sustainability.

Course Resources

1- Energy Systems Engineering, F.M. Vanek, L.D Albright, and Largus Angenent, Second Edition, McGraw-Hill, Inc., 2012.
2- Energy Conversion, Edited by D.Y. Goswami and F.Kreith, CRC Press, 2008. 2. G.N. Tiwari and R.K. Mishra, Advanced Renewable Energy Sources, RSC Publishing, 2012.

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following:

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	Introduction and scope of energy conversion. Motivations for studying future energy systems (e.g. pollution, climate change, energy security).
2	23/2	Overview of fossil fuel combustion and plants. Comparison of fuels (oil, natural gas and coal). Cycle analysis (Brayton, Rankine ,combined cycles, cogeneration).
3	2/3	Nuclear power: nuclear reaction physics, current reactor designs, Breeder reactors, nuclear fusion. Nuclear waste disposal.
4	9/3	Solar-thermal energy: radiation physics, radiation geometry.

5	16/3	Solar energy collection and conversion for heating systems. Concentrating solar thermal power. Stirling cycle
6	23/3	Photovoltaic technology. P-n junctions. Materials. Photovoltaic cells. Solar towers/heliostats.
7	30/3	Wind Energy: formation and availability. Wind turbine design. Turbine capacity factor. Tip speed ratio, Betz limit. Blade element theory. Operating conditions (sitting, height, wind speed variation, sitting density). Land requirements. Economics of wind energy.
8	6/4	Midyear exam
9	27/4	Geothermal and Ocean Current Energy : Physics, resources and availabilities, energy conversion technologies.
10	4/5	Biomass and Waste to Energy : Potential of biomass energy. Thermal-chemical and bio-chemical conversion. Syngas and liquid fuel production. System efficiency and environmental impact.
11	11/5	Electro-chemical conversion: physics of conversion, types and systems of fuel cells
12	18/5	Thermoelectric conversion: physics of conversion. Materials and applications
13	25/5	Overview of Climate Control, CO2 Sequestration and Energy Sustainability.
14	1/6	Final Exam

Course Code: ENP222

Heat Transfer

Aswan University, Faculty of Energy Engineering, Departments of High Voltage Networks, Spring Semester, 2013-2014

Instructor Information

Instructor: Dr. Mahmuod Hasan

Location: Faculty of Energy Engineering

Telephone: Office – +20 3481234

Office Hours: Thursday 12.00 - 14.00, sunday 10.00 – 14.00

E-mail: aswan1500@yahoo.com

Website:

Course Identification

Course Coder: ENP222

Level:	200
Course Name:	Energy conversion and utilization
Course Location:	Faculty of Energy Engineering
Class Times:	Thursday 9.00 - 12.00
Prerequisites:	NA
Faculty Web Page:	http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

Heat transfer is a subject taught the basic concepts and the simple technical applications of heat transfer. More extensive knowledge of the subject is expected of graduate engineers. The engineer should be familiar with the fundamentals of heat conduction, convective heat transfer and radiative transfer, as well as having a basic knowledge of mass transfer. However, it is important that the student acquires a broad understanding of the fundamentals and methods. Then it is sufficient to deepen this knowledge with selected examples and thereby improve problem solving skills.

Course Learning Objectives

Demonstrate knowledge of heat transfer definitions and terminology, including heat flux, thermal conductivity, and heat transfer coefficients. Demonstrate knowledge of conduction and the equivalent resistance formula, convective and use of the overall heat transfer coefficient, radiant heat transfer, including black bodies, gray bodies and emissivity. Demonstrate knowledge of heat exchangers, including the different types and how they operate, application. Demonstrate knowledge of mass transfer definition and compare it with convenient heat transfer. Apply this knowledge on various engineering application. Share ideas and work in a team in an efficient and effective manner under controlled supervision or independently.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Describe the development of global warming.
2- Explain the difference between turbulent and laminar flow regimes and how to determine which regime exists for a given flow.
3- Use correlations to calculate the convection heat transfer for flows over flat plates, cylinders, and sphere.

4- Determine the heat transfer coefficient and heat transfer rate using correlations for flow in cylindrical pipes.
5- Explain the difference between natural convection and forced convection.
6- Describe the relationship between radiation surface properties and radiation incident on a surface.
7- Determine the heat transfer from a grey surface given emissivity and the surface temperature.
8- Analyse the Heat transfer problems.
9- Deal with different used tables and charts.

Course Resources

1- Bird, R. B.; Steward, W. E. and Lishtbast, E. N., Transport Phenomena, John Wiley and Sons Inc., 1960.
2- Incroperal David, P. Devitt, Introduction to Heat Transfer, John Wiley and Sons, 1990.
3- Holman, J. P., Heat Transfer, McGraw Hill Book Co., 1990.
4- Geankoplis, C. J., Transport Processes and unit operations, Prentice Hall Int., 1993.

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following:

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	Introduction to heat transfer and development of global warming.

2	23/2	Conduction equation and its application for steady state in simple and compound walls
3	2/3	Conduction equation and its application for steady state in simple and compound cylindrical and spherical surfaces
4	9/3	Study of the critical radius of insulation, Extended surfaces (fins) and their efficiency charts.
5	16/3	Transient conduction
6	23/3	Introduction to convection heat transfer
7	30/3	Convection with internal flow and external flow.
8	6/4	Midyear exam
9	27/4	Parameters affecting convection.
10	4/5	Relations for free convection and forced convection
11	11/5	Fundamentals of radiation heat transfer
12	18/5	Heat exchanger
13	25/5	Introduction to mass transfer
14	1/6	Final Exam

Course Code: ENX31x

Renewable Energy Resources *(Elective Course)*
Aswan University, Faculty of Energy Engineering, Departments of High Voltage Networks,
Fall Semester, 2013-2014

Instructor Information

Instructor:	Prof. Dr. Salama Abdel-Hady
Location:	Faculty of Energy Engineering
Telephone:	Office – +20 3481234
Office Hours:	Monday 12.00 - 14.00, Thursday 10.00 – 14.00
E-mail:	salama_abdelhady@hotmail.com
Website:	

Course Identification

Course Coder:	ENX31x
Level:	300
Course Name:	Renewable Energy Resources (Engineering Elective Course 1)
Course Location:	Faculty of Energy Engineering
Class Times:	Monday 9.00 - 12.00
Prerequisites:	NA
Faculty Web Page:	http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

The origin and continuation of humankind is based on renewable energy such as solar and wind. The most basic processes supporting life on earth, such as photosynthesis and the rain cycle, are driven by solar and wind energy. From the very beginning of its history humankind realized that a good use of solar and wind energy is in humankind's benefit. Despite this, only recently, during the last 40 years, has solar and wind energy been har-nessed with specialized equipment and used as an alternative source of energy,

Course Learning Objectives

Identity different renewable energy, resources for power production such as wind, Solar, and non-conventional by hydro-power. Recognize natural sources of wind and solar ؟ energies in Egypt. Practice the operation and Design of Horizontal and Vertical Axis wind Turbines. Practice the Operation and Design of Solar flat plate collectors, concentrator systems, photovoltaic systems and other solar applications. Practice the operation of non-conventional hydro Power Systems Such as wave Energy and Tidal Energy. Recognize other renewable energy technologies such as Biomass, Ocean Thermal Energy …etc.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Identify the future energy systems and energy Sustainability.
2- Define the renewable energy
3- Study the causes and the power of wind energy
4- Study of measuring equipment for wind speed and direction.
5- Analysis of wind energy data: Energy and frequency curves.
6- Analysis wind turbine theory and aerofoil theory.
7- Study of forces acting on the wind turbine and study the turbine performance.
6- Study of solar thermal energy: Its intensity in outer space and the calculation of the solar intensity on earth.
9- Study of solar angles, Shades and the equation of time.
10- Study of the solar collector and its components.

Course Resources

1- Duffie and Beckman, Solar Engineering of Thermal Processes, John Wiley, 1980.

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following:

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	22/9/2013	Renewable energy, future energy systems and energy sustainability.
2	29/7	Causes and the power of wind energy
3	6/10	Measuring equipment for wind speed and direction
4	13/10	Wind energy and frequency curves
5	20/10	Aerofoil theory.
6	27/10	Wind turbine theory
7	3/11	Forces acting on the wind turbine and study the turbine performance
8	10/11	Midyear exam
9	17/11	Introduction to solar thermal energy
10	24/11	Intensity in outer space and the calculation of the solar intensity on earth
11	1/12	Solar angles, Shades and the equation of time.
12	8/12	Components of solar collector
13	15/12	Design of solar collector

14	22/12	Final Exam

Course Code: SEP32x

Pollution *(Elective Course)*

Aswan University, Faculty of Energy Engineering, Departments of Mechanical Power Station, Spring Semester, 2012-2013

Instructor Information

Instructor:	Dr. Mohamed Fathi
Location:	Faculty of Energy Engineering
Telephone:	Office – +20 3481234
Office Hours:	Tuesday 12.00 - 14.00, Wednesday 10.00 – 14.00
E-mail:	mfsadik@yahoo.com
Website:	

Course Identification

Course Coder:	SEP32x
Level:	300
Course Name:	Pollution (Special Elective Course 2)
Course Location:	Faculty of Energy Engineering
Class Times:	Tuesday 9.00 - 12.00
Prerequisites:	NA
Faculty Web Page:	http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

This course covers the practices and technologies that are applied to the prevention of air pollution, and to the cleaning and control of industrial air emissions. It provides a bridge for today's environmental manager by focusing on an integrated approach to managing air pollution problems within industrial operations.

Course Learning Objectives

Know the: definition of pollution - Sources of pollution - Types of pollution and their effect on lumen health. Methods of measurement - methods of pollutant reduction.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:
1- Define the environment and climate change.
2- Define the pollution.
3- Identify the sources of pollution.
4- Identify the types of pollution.
5- Discuss their effect on lumen health.
6- Identify the methods of measurement.
7- Apply the methods of pollutant reduction.

Course Resources

1- Nicholas P. Cheremisinoff, HANDBOOK OF AIR POLLUTION PREVENTION AND CONTROL, Elsevier Science (USA), 2002.
2- Boubel et al. (1994) Fundamentals of Air Pollution, 3rd Edition. Academic Press.

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

http://lwf.ncdc.noaa.gov/oa/climate/gases.html#cd
http://lwf.ncdc.noaa.gov/oa/climate/gases.html#m
http://lwf.ncdc.noaa.gov/oa/climate/gases.html#n2o
http://www.gsf.de/eurotrac
http://www.epa.gov/air/airtrends/reports.html
http://www.epa.gov/air/airtrends/aqtrnd03/
http://www.epa.gov/oar/caa/contents.html
http://www.epa.gov/air/basic.html
http://yosemite.epa.gov/R10/AIRPAGE.NSF

http://en.wikipedia.org/wiki/Air_pollution

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following:

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	Environment and climate change
2	23/2	Primary and secondary pollution
3	2/3	Sources of pollution
4	9/3	Types of pollution.
5	16/3	Air pollution regulation
6	23/3	Toxic pollutants
7	30/3	Radioactive pollutants
8	6/4	Midyear exam
9	27/4	Indoor pollutants
10	4/5	Ventilation and air quality control
11	11/5	Methods of measurement
12	18/5	Effect on lumen health
13	25/5	Pollutant reduction.
14	1/6	Final Exam

Course Number:AQA121

University of Aswan, Faculty of Science, Department of Mathematics,
Summer Semester, 2013-2014

Instructor Information

Instructor: Dr. Adel A. El-Faheem
Office Location: Aswan University Campus
Telephone: Office – +20 3481533
Office Hours: Sunday 10.00 – 13.00
E-mail: elfaheem@aswu.edu.eg
Website:

Course Identification

Course Number: AQA121
Course Name: Statistical Biology and Experimental Design
Course Location: University Campus
Class Times: Sunday 10.00 – 13.00
Prerequisites: Introduction to Probability and Statistics
Faculty Web Page:

Course Description/Overview

This course is an introduction to statistics, experimental design and statistical analysis for addressing problems in biology. Statistics includes those techniques and tools used for the collection, display, and analysis of data for the purpose of making decisions or constructing mathematical models. Thus, we will explore the theoretical properties of statistical inference methods, and we will apply these methods to many sets of real data from the surrounding environment and climate change and its impact on fisheries statistics. The course begins with methods for collecting and summarizing data and analyzing and studying the measures of central tendency and measures of dispersion. The course then introduces probability theory as a background for understanding inferential statistics and Design of Experiments. Methods are next presented for drawing inferences from research samples to populations from which the samples were drawn. The course covers basic statistical tests: analysis of variance, and Latin square - block design - the design of the cluster - the analysis of covariance.

Course Learning Objectives

The main goals of this course are practical:
1) to help you learn and practice basic experimental design, statistical methods, and tools for analyzing data,
2) to help you better critically interpret the primary biological literature. We work as much as possible with real biological problems and data sets related with environment and climate change,
3) to apply statistical methods learned to help solve interesting and realistic problems across a variety of fields.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. To learn basic techniques for collecting and summarizing data and analyzing and studying the measures of central tendency and measures of dispersion.
2. To appreciate the importance of how data are produced.

3. To understand the mathematical theory behind common methods of statistical inference, such as analysis of variance and the analysis of covariance .
4. To apply statistical methods learned to help solve interesting and realistic problems across a variety of fields.
5. To gain facility in analysis of variance, and Latin square - block design - the design of the cluster - the analysis of covariance.

Course Resources

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

1- Snedecor, G. W. and W. G. Cochran (1969). Statistical Methods 6th ed. Iowa State Univ., Press, Ames.

2- Steel, R. G. D. and J. H. Torrie (1980). Principles and procedures of Statistical: A biometrical Approach 2nd Ed. New Yourk U.S.A.

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments/attendance/participation	15 degrees
Midyear Exam	15 degrees
Applied Part	10 degrees
An oral exam	10 degrees
Final Exam	50 degrees
Total Points	100

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than 25% of classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 15% of the grade.

Dissability

N.A.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/3/2014	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	23/3	Methods for collecting and summarizing data
3	30/3	Analyzing and studying the measures of central tendency.
4	13/4	Measures of dispersion.
5	27/4	Introduces probability theory as a background for

		understanding inferential statistics
6	4/5	Understanding inferential statistics and testing the significant.
7	11/5	Introduction to Design of Experiments
8	18/5	Analysis of variance.
9	25/5	Latin square - block design - the design of the cluster -
10	1/6	Design sectors
11	8/6	Design Cluster
12	15/6	the analysis of covariance

APENDIX I:

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number: 332 Bot.

Ecology and Physiology of Algae

Aswan University, Faculty of Science

Instructor Information

Instructor: Dr. Ahmed M. El-Otify
Office Location: Aswan University Campus
Telephone: (+20) 97 233 15 61
Office Hours:
E-mail: elotify57@yahoo.co.uk
Website:

Course Identification

Course Number: **332 Bot.**
Course Name: **Ecology and Physiology of Algae**

Course Location: Aswan University campus
Class Times: Monday, 9 - 12 am
Prerequisites: General Botany - Phycology
Faculty Web Page:

Course Description/Overview

This course focuses on the studying of the relationships between algae in different habitats and their environment. Algae occupied different niche habitats in aquatic ecosystems. They live as phytoplankton or may be associated to various natural or artificial substrates and live as attached forms (phycoperiphyton). On the other hand, terrestrial algae may occupy different non-aquatic habitats and can live as soil algae, lichenized or rhizospheric forms. Generally, algae in different habitats are influenced by various abiotic and biotic factors prevailed in their environments. Alterations that may take place in the environmental conditions can influence the development and distribution of algae in their environments. Algae in aquatic ecosystems are regarded as the base of food web and have a pivotal role in influencing other aquatic biota in such habitats.

Course Learning Objectives

The main objective of the ecology of algae is to understand the concept of environmental conditions as well as the alterations that may take place in these conditions and the extent to which these conditions can influence the various communities of algae. For instance, studying of the ecology of phytoplankton and attached algae in aquatic habitats and of soil algae in terrestrial habitats.

Course Content Learning Outcomes

Upon successful completion of this course, students should be able to: demonstrate and understand the concept of the ecology of algae. In addition, students would be able to determine the role of algae in the ecosystem. Furthermore, the

students would be able to use the knowledge of algae and their habitats for environmental impact assessment. Besides, the students would be able to identify the algae of economic value and others that may be harmful.

Course Resources:

1. Reynolds, C. S. (1984). The ecology of freshwater phytoplankton. Cambridge University Press, London: 384pp.
2. Round, F. E. (1982). The ecology of algae. Cambridge University Press, London: 653pp.
3. Sournia, A. (1978). Phytoplankton manual. Paris: UNESCO: 337pp.
1. Wetzel, R. G. and Likens, G. E. (2001). Limnological Analyses (3rd edn). Springer, USA

Course Website(s)

Required Course Texts and Materials

Assignments and Grading Scheme

Grading Policy

Grades can be based on the following: (Example)

Activities participation and class attendance	10%
Final Lab. Exam.	30%
Final Written Exam.	60%
Total Points	**100%**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)

1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Introduction to the ecology of algae.
3		Distribution of algae.
4		General outlook on phytoplankton
5		Sampling, preservation, qualitative and quantitative determinat of phytoplankton.
6		Factors influencing the distribution of phytoplankton.
7		Factors influencing the distribution of phytoplankton.
8		Limiting factors for phytoplankton development and distribution.
9		Man- made effects on phytoplankton.
10		Eutrophication, water blooms and harmful algae.
11		Eutrophication, water blooms and harmful algae.
12		General outlook of the attached algae.
13		Studying of attached algae and the factors influencing their development.
14		General outlook of soil algae.
15		Sampling and studying the factors influencing the growth and distribution of soil algae.

Instructor Information

Instructor: Associate Prof. Dr. Ashraf Emam
Office Location: Aswan University Campus
Office: 319, 3rd floor, Labs Building of Faculty of Science
Telephone: Office +20 973481533
Office Hours: Sunday 12.30-4.00 pm, Wednsday 12.30 – 4.00 pm.
Email: emam99@aswu.edu.eg
ashrafemam99@hotmail.com
Website: http://sci.aswu.edu.eg/Staff/emam99/Pages/default.aspx
http://scholar.google.com/citations?user=pod-43UAAAAJ

Course Identification

Course Number: **GEO 410**
Course Name: Economic Geology
Course Location: University Campus
Class Times: 2:00 – 3:00 pm, Sunday
Faculty Web Page: http://sci.aswu.edu.eg

Course Description:

Resources formed by geological processes are commonly called mineral resources and the branch of geology which concerned with the study of these resources is called Economic geology. This course provides an introduction to the geologic and economic factors that result in the development of commercial concentrations of mineral resources. Emphasis will be placed on the descriptive geology and origin of economic mineral concentrations within the context of their overall geologic settings. The geologic and economic nature of metallic and industrial mineral commodities in both "hard rock" and "soft rock" geologic environments will be discussed. Related topics

to be discussed include importance of mineral resources to the global economy, mineral exploration and evaluation, mineral extraction and processing, and environmental impacts result from mining and mineral extraction.

Course Learning Objectives:
The course looks at the origin and occurrence of economic natural resources including metallic ore deposits and industrial minerals. The course aims to provide students with a knowledge and understanding of the origin and distribution of mineral resources, the geologic factors that have led to ore deposit formation, and the geologic conditions that control the environmentally responsible development. Also, students should comprehend the wide variety of ore-forming processes, and have developed skills in interpreting ore deposits and exploration techniques.

Course Content Learning Outcomes
Upon successful completion of this course, students will be able to:

1. Demonstrate knowledge of the variety of ore-forming processes and discuss the key geological processes responsible for ore deposit formation.
2. Identify common rock types and minerals found in and around ore deposits.
3. Describe the essential geological setting of the main ore deposit types that provide the majority of the metals required by human society.
4. Understand the genesis of mineral deposits and their relationship to plate tectonics in time and space.
5. Describe the ore deposit classification and distribution in Egyptian deserts.
6. Be conversant with the environmental impacts of mining processes.

Required Course Texts and Materials:
Reference textbook for this course are:
1) An introduction to ore geology, Evans (1987)
2) Ore deposit geology and its influence on mineral exploration, Edwards and Atkinson (1986)

In addition, selected publications in the fields relevant to the topics will be reviews and discussed extensively.

Assignments and Grading Scheme

Grading System
0 to 150 (where 90 is the least pass mark)

Grading Policy

Assignments	20%
Exams	70%
Class attendance/participation	10%
Total Points	**100**

Course Schedule

Week	Date	Topics
1		Discussion of syllabus, assignments, and course requirements.
2		Natural concentration of ores
3		Migration of ore forming fluids
4		Deposition of ores
5		Classification of ore deposits
6		Geothermometry
7		Magmatic ore deposits
8		Metamorphic ore deposits

9		Supergene enrichment
10		Sedimentry ore deposits
11		Mineral deposits in Egypt
12		Natural concentration of ores
13		Migration of ore forming fluids
14		Hazards associated with ore resources exploitation.

Instructor Information

Instructor: Associate Prof. Dr. Ashraf Emam
Office Location: Aswan University Campus
Office: 319, 3rd floor, Labs Building of Faculty of Science
Telephone: Office +20 973481533
Office Hours: Sunday 12.30-4.00 pm, Wednsday 12.30 – 4.00 pm.
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http://scholar.google.com/citations?user=pod-43UAAAAJ

Course Identification

Course Number: **GEO 434**
Course Name: Environmental Geology
Course Location: University Campus
Class Times: 2:00 – 3:00 pm, Wednesday
Faculty Web Page: http://sci.aswu.edu.eg

Course Description:
Environmental geology is a science which objectively studies geologic information and applies it to contemporary environmental problems such as pollution, waste management, resource extraction, natural hazards, and human health. An environmental geologist might evaluate the risk and damage potential from natural hazards such as floods, landslides, volcanoes, or earthquakes. The environmental changes on local to global scales can be placed into an earth systems science perspective through examining the evolution and structure of our planet's components, and how these components naturally interact. This course is designed to introduce students to the relationship between humans and our Earth. It focuses on environmental and geosciences subjects that facilitate greater awareness of the interactions between the different Earth's components. The course discusses the geologic processes that shape the surface of the Earth, and how these processes affect and are affected by human activity. Moreover, the relationships between the lithosphere, hydrosphere, and atmosphere will be discussed. Particular attentions are given to the subjects of soil, mineralogy, biogeochemical cycles, climate change, and pollution by human activities. The scientific methods that allow studying, prediction, and mitigation of environmental problems will be discussed.

Course Learning Objectives:
The course introduces students to our natural environment and the human interactions and everyday problems with our environment and global community from a geological perspective. Topics to be covered will include; earth materials and structure, environmental hazards such as floods, volcanoes and earthquakes, pollution of the environment, waste disposal, natural resources, and energy sources and their exploitation. The overarching goals of this course are to:

- Provide the fundamental concepts of environmental geology, and the interactions between the Earth systems and human activities.

- Increase awareness of environmental issues and how they affect society.
- Raise awareness of the natural hazards associated with common geologic processes including volcanoes, earthquakes, tsunamis, and floods.
- Gain an understanding of the physical processes that operate in and on earth.
- Understand the interactions between humans and these geological processes.
- Introduce the environmental challenges such as climate change, the global water quality and supply, and the scale of these challenges
- Summarize the pollutants and harms that are created from exploitation of ores, minerals and energy resources.
- Process and interpret the environmental data to solve environmental problems.

Course Content Learning Outcomes
Upon successful completion of this course, students will be able to:

18. Discuss the fundamental concepts of environmental geology, the earth system and the different environmental cycles, and the interactions between the Earth systems and human activities.
19. Understand the geologic processes and associated natural hazards, the pollutants and harms, created from ore and energy resources exploitation.
20. Understand the interactions between humans and the geological processes.
21. Summarize the environmental challenges such as climate change, the global water quality and supply.
22. Process and interpret the environmental data and apply scientific methods to solve environmental problems.

Required Course Texts and Materials:
Reference textbook for this course are:
1) Principles of Environmental Geochemistry by G. Nelson Eby, Brooks/Cole, 2004; 2) Environmental Geology, 8th edition, by Edward A. Keller Prentice Hall, 2000.
3) The Geology of Egypt, by Said, R., Ed. (1990).
In addition, selected publications in the fields relevant to the topics will be reviews and discussed extensively.

Assignments and Grading Scheme

Grading System
0 to 150 (where 90 is the least pass mark)

Grading Policy

Assignments	20%
Exams	70%
Class attendance/participation	10%
Total Points	**100**

Course Schedule

Week	Date	Topics
1		Discussion of syllabus, assignments, and course requirements.
2		Environmental geology: Fundamental concepts and definitions.
3		Earth structure and systems.
4		Geologic cycle and processes
5		Soil formation, classification and profile
6		Mass wasting processes

7		Volcanism: tectonic setting and types
8		Volcanic hazards, volcanoes and climate
9		Earthquake process, magnitude and intensity
10		Hazards and effects of earthquakes
11		Hazards associated with Floods and torrents
12		Hazards associated with ore and energy resources exploitation.
13		Wastes management
14		The environmental challenges (climate change, the global water quality and supply).

Course	Environmental Geology
Module 1	**Introduction**
Key Concepts	Environmental geology: Fundamental concepts and definitions
Overview	Environmental geology is the use of geologic information to help us solve conflicts in land use, to minimize environmental degradation, and to maximize the beneficial results of using our natural and modified environments. This module discusses the basic concepts and principles of environmental geology, and defines the commonly used terms and issues. The module provides general introduction to Environmental Geology, environmental ethics, environmental Crisis and fundamental concepts of the environmental sciences
Aim	The overriding aim of this module is to turn students able to discourse on basic concepts and principles of environmental geology, definitions of commonly used terms and issues, and fundamental concepts that apply to all environmental sciences.
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss the different terms, concepts and principles of environmental geology. • Summarize the environmental ethics and crisis

Units	Unit 1.1: Introduction to Environmental Geology. Unit 1.2: Environmental Ethics. Unit 1.2: Environmental Crisis. Unit 1.4: Fundamental Concepts of the Environmental Sciences.
Readings	Environmental Geology, Lundgren, L. W., 1999 Environmental Geology, 8th edition, Keller E. A., 2000
Activity	What environmental geology means? Discuss the basic concepts of environmental geology? Write brief notes on environmental ethics and crisis?
Module 2	**Geologic cycles and processes**
Key Concepts	Plate tectonics, rock cycle, water cycle, surficial process
Overview	This module focuses on the geologic cycle including tectonic, hydrologic, rock, and biogeochemical sub-cycles that influence each other and may produce natural hazards and processes important to environmental geology such as landslides, earthquakes, volcanic activity, flooding, groundwater flow, and weather. Next, the module spotlights on the three rock families and their properties, such as a compressive strength and response to stress and strain that are essential to evaluating natural hazards.
Aim	The overriding aim of this module is to enhance student understandings about the geologic cycle, rock properties and surfacial process.
Learning Outcomes	At the end of this module students will be able to: • Identify and discuss the geologic sub-cycles • Understand the surficial processes that produce natural hazards.
Units	Unit 2.1: Geologic Cycle Unit 2.2: Hydrologic Cycle Unit 2.3: Biogeochemical Cycle Unit 2.4: Physical Properties of Rocks

	Unit 2.5: Surficial Processes
Readings	Environmental Geology, Lundgren, L. W., 1999 Environmental Geology, 8th edition, Keller E. A., 2000
Activity	Where do volcanoes and earthquakes occur? What is the percent of fresh water on earth? How much carbon dioxide enters the Earth's atmosphere each day? What is carbon dioxide's residence time in the atmosphere? Define the three types of stress? What are the physical earth processes might cause each, and what strain would result? What are the differences between elastic and plastic deformations?
Module 3	**Soils**
Key Concepts	Soil formation, soil profile, soil physical properties
Overview	The module focuses on soils--how they are formed and classified, their texture and structure, how liquids move through them, and their engineering properties. The module concludes the effects of land use activities on soil which results in erosion, pollution, and desertification.
Aim	The overriding aim of this module is to turn students able to understand the principle factor controlling soil formation, and to evaluate the physical properties of soils as engineering materials.
Learning Outcomes	At the end of this module students will be able to: • Reveal knowledge on the soil formation factors • Identify the different soil horizons and soil profile • Determinate the physical and engineering properties of soils
Units	Unit 3.1: Soil formation and classification Unit 3.2: Soil horizons and soil profile Unit 3.3: Physical properties of soils
Readings	Environmental Geology, 8th edition, Keller E. A., 2000

Activity	What are the main factors controlling soil formation? What are the criteria that used to make soil classification? Define the most common soil horizons and their characteristics? What are the physical parameters you use to evaluate soils for engineering purposes?
Module 4	**Slope Failure and Mass Wasting Processes**
Key Concepts	Slope Profiles, Slope Stability, Types of Mass Wasting, The Human Impact of Landslides, Subsidence
Overview	Slope failure, also referred to as mass wasting, is the down-slope movement of rock debris and soil in response to gravitational stresses. This module focuses on the types of mass wasting classified based on the type of down-slope movement. The types of movement, falls, slides, and flows are covered in this module. In addition, another type of ground failure and subsidence are covered.
Aim	The overriding aim of this module is to turn students able to discourse on major types of mass wasting and their causes.
Learning Outcomes	At the end of this module learners will be able to: • Identify the slope stability and types of down-slope movement. • Understand the different mass wasting processes. • Summarize the driving and resisting forces. • Discuss the effects of water and earth materials on slope failure.
Units	Unit 4.1: Slopes and slope profiles Unit 4.2: Mass wasting processes Unit 4.3: Types of down-slope movement Unit 4.4: Slope stability, driving and resisting forces Unit 4.5: Water and ground material effects on pattern of slope failure
Readings	Environmental Geology, 8th edition, Keller E. A., 2000

Activity	List the common mass wasting processes and types of slope failure? Write brief notes on slope stability, driving and resisting forces? Summarize effects of water and earth materials on slope failure pattern? What are the conditions causing the slope failure?
Module 5	**Volcanism and Earthquakes**
Key Concepts	Major Types of Volcanoes, Volcanic Hazards, Effects of Volcanoes, Earthquake Process, Magnitude and Intensity Earthquakes, Effects of Earthquakes.
Overview	Volcanoes differ greatly in style of eruption and associated hazards. Moreover, earthquakes are probably the most frightening naturally occurring hazard encountered. This module discusses the types of volcanoes and earthquake process, effects of volcanoes and earthquakes, and their associated hazards. It includes the following major topics: tectonic setting and types of volcanoes, volcanic hazards, predicting volcanic activity, volcanoes and climate, types of faults and earthquake process, detecting, locating and measuring earthquakes.
Aim	The overriding aim of this module is to turn students able to discourse on major types of volcanoes and earthquake process, their primary and secondary effects, and the associated hazards.
Learning Outcomes	At the end of this module learners will be able to: • Understand tectonic setting of volcanoes. • Identify the common types of volcanoes. • Summarize the effects and hazards of volcanoes. • Understand the earthquake process, their magnitude and intensity • Summarize the effects and hazards of earthquakes
Units	Unit 5.1: Volcanoes: tectonic setting and types. Unit 5.2: Volcanic hazards and predicting volcanic activity. Unit 5.3: Volcanoes and climate.

	Unit 5.4: Types of faults and earthquake process. Unit 5.5: Magnitude, intensity and effects of earthquakes
Readings	Environmental Geology, 8th edition, Keller E. A., 2000
Activity	What are the common types of volcanoes? List and briefly describe the primary and secondary environmental effects of volcanic eruptions? Discuss the relationship between the volcanic activity and climate? List and briefly describe the primary and secondary environmental effects of earthquakes?

APENDIX I:

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Fish Adaptation and Climatic Changes

Course Number: ENV 114

Aswan University, Faculty of Fish and Fisheries Technology,

Instructor Information

Instructor: Dr. Ahmed M. El-Otify
Office Location: Aswan University Campus
Telephone: (+20) 97 233 15 61
Office Hours:
E-mail: elotify57@yahoo.co.uk
Website:

Course Identification

Course Number: **ENV 114**
Course Name: **Fish Adaptation and Climatic Changes**
Course Location: University of Aswan
Class Times:
Prerequisites:
Faculty Web Page:

Course Description/Overview

The pressure exerted due to global warming and climatic change on aquatic habitats or fish stock of inland water systems should be considered for better sustainable development of these resources. This course deals with the identification of global warming as well as climatic changes and describes the main bases and scientific principles of the climatic changes and their influences on the fresh- and marine water habitats particularly on fisheries and fish production. Also, the course pays an attention of the main sources for global warming and possibilities for mitigation of such effects.

Course Learning Objectives

The main objective of fish adaptation and climatic change is to understand the concept of mitigation of the climatic change effects on fisheries of different aquatic ecosystems and to fisheries for better exploitation of water resources and integrated management of fisheries and fish resources.

Course Content Learning Outcomes

Upon successful completion of this course, students should be able to: demonstrate and understand how fish resources and fisheries are influenced due to global warming and climatic change. In addition, students would be able to deal with sustainability of water, fish resources and fisheries.

Course Resources:

1. Ismael, E. M. (2000). Climatic changes and their environmental effects. Dar El-Fekr El-Arabi – Cairo. (In Arabic).
2. Ouda, K. A. Atlas (2010). Risks of climatic changes on Egyptian coasts. Assiut University, Assiut, Egypt (In Arabic).
3. Stenseth, N. C. (2007). Effects of climate change on marine ecosystems. CR 37: 121-122.
4. Hawkins, S. J. ; Moore P. J. ; Burrows, M. T. Poloczanska, E.; Mieszkowska, N. Herbert, R. J. H.; Jenkins, S. R. ; Thompson, R. C.; Genner, M. J. and Southward, A. J. (2007). Complex interaction in a rapidly changing world: responses of rocky shore communities to recent climate change. CR 37: 123- 133.
5. Pehlke, C. and Bartsch, I. (2007). Changes in depth distribution and biomass of sublittoral seaweeds at Helgoland (North Sea) between 1970 and 2005. CR 37: 135- 147.
6. Barnes D. K. A. and Peck, L. S. (2007). Vulnerability of Antractic shelf biodiversityto redicted regional warming. CR 37: 149- 163.
7. Beesley, A.; Lowe D. M.; Pascoe, C. K. and Widdicombe, S. (2007). Effect of CO_2 induced seawater acidification on the health of *Mytilus edulis*. CR 37: 215- 225.

Course Website(s)

Required Course Texts and Materials

Assignments and Grading Scheme

Grading Policy

Grades can be based on the following: (Example)

Activities participation and class attendance	15%
Mid-term Exam	10%
Final Lab. Exam.	15%
Oral Exam.	10
Final Written Exam.	50
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to

leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Introduction to global warming and climatic change.
3		Factors affecting the global warming phenomena.
		Factors affecting the global warming phenomena
4		Gases of greenhouse effect.
		Gases of greenhouse effect.
5		Effect of the climate change on marine ecosystem.
6		Effect of the climate change on marine ecosystem.
7		Effect of the climate change on marine ecosystem.
8		Responses of rocky shores communities to recent climate change.
9		Responses of rocky shore communities to recent climate change.

10		Changes in depth distribution and biomass to recent climate change.
11		Changes in depth distribution and biomass to recent climate change.
12		Environmental stress on the productivity and physiology of aquatic biota and methods of their measurements.
13		Environmental stress on the productivity and physiology of aquatic biota and methods of their measurements.
14		Adaptability of fish and other aquatic biota to the climate change stress.
15		Adaptability/ mitigation of fish and other aquatic biota to the climate change stress.

APENDIX I:

Course Number: … Bot.

Flora of Egypt
Aswan University, Faculty of Science

Instructor Information

Instructor: Dr. Mohamed G. Sheded
Office Location: Aswan University Campus
Telephone: (+20) 97 230 83 36
Office Hours:
E-mail: msgaber1960@yahoo.com
Website:

Course Identification

Course Number: **Bot.**
Course Name: **Flora of Egypt**
Course Location: Aswan University campus
Class Times: Monday,
Prerequisites: General Botany – Plant taxonomy
Faculty Web Page:

Course Description/Overview

This course focuses on the floristic composition and distribution in Egypt. The distribution of Egyptian flora includes main regions namely; The Nile valley, eastern and western deserts, oases of the western desert, Mediterranean coasts, Red sea coast, Sinai.

Course Learning Objectives

The main objective of this course is to understand the concept of the Egyptian flora, their distribution in the different types of habitats. In addition, the course pays an attention on analysis of the phytosociological behaviour and size structure of the important and predominant plants.

Course Content Learning Outcomes

Upon successful completion of this course, students should be able to: demonstrate and understand the concept of the flora of Egypt. In addition, students would be able to differentiate between the floristic compositions of the different ecosystems in Egypt. Furthermore, the students would be able to use keys and manuals to identify the natural vegetation of different Egyptian habitats. Besides, the students would be able to recognize the plants of economic and medicinal values.

Course Resources:

1. Boulos, L. (2000). Flora of Egypt. Cairo: Al-Hadara Publishing.
2. Täckholm, V. (1974). Student's Flora of Egypt. Cairo University Presss. 888pp.

Course Website(s)

Required Course Texts and Materials

Assignments and Grading Scheme

Grading Policy

Grades can be based on the following: (Example)

Activities participation and class attendance	10%
Final Lab. Exam.	30%
Final Written Exam.	60%
Total Points	**100%**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)

1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Historical introduction.
3		Current studies on Egyptian Flora.
4		Different plant geographical regions.
5		Different plant geographical regions.
6		Vegetation covers of the different geographical regions.
7		Vegetation covers of the different geographical regions.
8		Cultivated plants in Egypt.
9		Cultivated plants in Egypt.
10		Ornamental plants in gardens.
11		Plants of vegetables and fruits.
12		Plants of vegetables and fruits.
13		Medicinal plants.
14		Medicinal plants.
15		Field trips for some sites that have diversified floristic compositions.

Course Number: GEO 427

Paleoecology and Biostratigraphy

Aswan University, Faculty of Science, Geology Department

Instructor Information

Instructor: Prof. Dr. Abdel Aziz Tantawy
Office Location: Aswan University Campus
Office: 310, 3rd floor, Labs Building of Faculty of Science
Telephone: Office : +20 973480450
Office Hours: Monday 11.00-2.00 pm, Thursday 11.00 – 2.00 pm.
Email: aatantawy@yahoo.com
aatantawy @aswu.edu.eg
Website:

Course Identification

Course Number: **GEO 427**
Course Name: Paleoecology and Biostratigraphy
Course Location: University Campus
Class Times: 12:00 – 1:00 pm, Monday
Faculty Web Page: http://sci.aswu.edu.eg

Course Description:
During the course, the students are introduced to different aspects of paleoecology and biostratigraphy. This course introduces students to the relationships of fossil organisms to one another and to their physical environment,. This course will introduce past environments, discuss common proxies for studying paleoecology, and examine ecological principles as applied to the past. The course will provide a foundation for starting and performing research in the field of paleoecology, paleoclimatology, and climate change studies.

Course Learning Objectives:

The course provides an insight into the broader aspects of the biostratigrapy and chronostratigraphy, as their application expects into the fields of paleoceanography, and paleobiology and the usage of different age dating methodologies and techniques. It provides basic background information for understanding paleoecology and discusses the major concepts and themes of paleoecology, and methods of paleoecological analysis. It also provides state-of-art summaries of different marine environments and paleocologic niches.

Course Content Learning Outcomes
Upon successful completion of this course, students will be able to:

1. Understand the fundamental concepts in paleoecology.
2. Understand how both spatial and temporal scale and variability influences study of the past.
3. Have a working knowledge of how to "do" paleoecology and the strengths and weaknesses of paleoecological data.
4. List multiple definitions of the niches and demonstrate common methods to infer the niches through time.
5. Discuss how spatial and temporal scale influence ecological properties of populations, species, communities, and ecosystems.
6. constructing range charts and zonal schems for any given time interval using the index fossils provided.
7. Get knowledge about the age dating methods using the biostigraphic and radioactive techniques.
8. Get knowledge about paleoecologic and paleoenvironmenal interpretations.
9. Develop critical thinking and communication skills.

Course Resources:

1. Plankton Stratigraphy. Edited by Bolli et al. (1985). Cambridge university press, volume 1, Chapters 10 & 11 .
2. International stratigraphic guide. (1976).
3. Paleoceanography. Richard. A. Davis (1972) .

4. Periodicals, Web Sites, … etc
   - Biostratigraphy Journal.
   - Palaeogeorapy, palaeoclimatology, Palaeoecology Journal.
   - Earth and planetary science website.

Assignments and Grading Scheme

Grading System
0 to 150 (where 90 is the least pass mark)

Grading Policy

Activities participation and class attendance	70%
Final Lab. Exam.	20%
Final Written Exam.	10%
Total Points	**100**

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends.

Course Schedule

Week	Date	Topics
1	Oct. 12, 2014	Discussion of syllabus, assignments, and course requirements.
2	Oct. 19, 2014	Fundamental concepts and Definitions
3	Oct. 16, 2014	Classification of marine environments
4	Nov. 2, 2014	Classification of marine biota
5	Nov. 9, 2014	Communities and Ecosystems
6	Nov. 16, 2014	Ecological factors in the marine environments
7	Nov. 23, 2014	Fossils as indicators for paleo-environments
8	Nov. 30, 2014	Introduction to biostratigraphy (basic definitions)
9	Dec. 7, 2014	Kinds of Biostratigraphic units
10	Dec. 14, 2014	Inferring paleoenvironmental change
11	Dec. 21, 2014	Kind of chronostratigraphic units and their equivalent geochronologic units
12	Dec. 28, 2014	Radioactive isotopic age determination methods
13	Dec. 4, 2014	Final Exam

APENDIX I:

Course Number:

Plant Ecology

Aswan University, Faculty of Science, Department of Botany Teachers Education, Spring Semester, 2011-2012

Instructor Information

Instructor:	Dr. Usama Mahalel
Office Location:	Aswan University campus
Telephone:	Office – +2 0973481533
Office Hours:	Tuesday 14.30- 17.00, Wednsday 14.00 – 16.00
E-mail:	mahalel71@aswu.edu.eg@aswu.edu.eg
Website:	

Course Identification

Course Number:	
Course Name:	**Plant Ecology**
Course Location:	University of Aswan
Class Times:	Wednesday 8:30pm – 11:30am
Prerequisites:	ICT literacy

Faculty Web Page: http://www.Sci.uoc.gr

Course Description/Overview

Ecology is studying the interactions and interrelationships among organisms and their environment, such as the interactions organisms have with each other and with their abiotic environment. Topics of interest to ecologists include the diversity, distribution, amount (biomass), number (population) of organisms, as well as competition between them within and among ecosystems. Ecosystems are composed of dynamically interacting parts including organisms, the communities they make up, and the non-living components of their environment. As a basic science, ecology informs us about the processes governing the patterns we observe in nature. From an applied perspective, it is critical that we understand ecology as it provides insights and solutions to many of the environmental issues we are confronted with in our daily lives. In this course we will focus specifically on the ecology of plants.

Course Learning Objectives

The main objective of ecology is to understand the dynamics of our surroundings and to take proper measures to conserve it if and when required. However, the main objective of ecology is to study:

1. The inter-relationship between organisms in population and communities.

2. The structural adaptations and functional adjustments of organisms to their physical environment.

3. The behaviour of organisms 'under natural conditions.

5. The biological productivity of nature and its relationship with mankind.

6. Temporal changes in the occurrence, abundance and activities of organisms.

7. Conservation and management of natural resources and pollution.

Course Content Learning Outcomes

Upon successful completion of this course, students should be able to: demonstrate an understanding of how biotic and abiotic factors affect the abundance and distribution of plants in natural communities. Most importantly, you should leave this course better able to**:**

1) Describe how organisms' interactions with their environment and other organisms give rise to patterns in their abundance and distribution.
2) Demonstrate knowledge of the important ecological principles that operate at the levels of the individual organism, the population, the community, and the ecosystem.
3) Synthesize information across levels of ecological organization.
4) Critically evaluate work published in both the primary literature and popular press.
5)) Observe patterns and ask interesting ecological questions.
6) Analyze and interpret data generated from ecological experiments.
7) Communicate your findings in both written and oral format to your peers, and the larger scientific community.
8) Apply ecological principles to current environmental challenges and conservation concerns.

Course Resources

Course Website(s)

Required Course Texts and Materials

Textbook (required)-

*Gurevitch, J., S.M. Scheiner, and G.A. Fox. 2002. The Ecology of Plants. Sinauer Associates, Inc. Sunderland, MA, U.S.A.

Additional readings-

*Pollan, M. Botany of Desire. 2002. Random House Trade Paperbacks. NY, NY, U.S.A.

*Ambrose, H.W. III and K.P. Ambrose. 2001. A Handbook of Biological Investigation. 5th ed.

Hunter Textbooks Inc. Winston-Salem, NC, U.S.A.

*Crawley, M.J. 1996. Plant Ecology. 2nd ed. Blackwell Publishing. Malden, MA, U.S.A.

*Gotelli, N.J. 2001. A Primer of Ecology. 3rd ed. Sinauer Associates, Inc. Sunderland, MD,

U.S.A

Assignments and Grading Scheme

Grading Policy

Grades can be based on the following: (Example)

Assignments	20%
Exams	60%
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	15/2/2012	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	22/2	Introduction to plant Ecology
3	29/2	Abiotic factors,
4	7/3	Light and temperature relations
5	14/3	Temperature, humidity, wind Light and Photosynthesis
6	21/3	Global patterns of vegetation
7	28/3	Plant adaptations to the environment
8	4/4	Water and soil relations
9	25/4	Nutrient acquisition
10	2/5	Growth and reproduction
11	9/5	Population structure and growth
12	16/5	Ecology of pollination and seed dispersal

13	23/5	Life history strategies
14	30/5	Positive interactions
15		Negative interactions
16		General review

APENDIX I

Course Syllabus
Course Number: 432.bot
Plant community
Aswan University, Faculty of Science, Department of Botany,
2013-2014
Instructor Information
Instructor: Prof.Dr. Mohamed Gabr Sheded
Office Location: University Campus
Telephone: Office +20 97480450 (3270)
Office Hours: Tuesday 10- 12
E-mail: msgaber1960@Yahoo.co
Website:
Course Identification
Course Number: **432.bot**

Course Name: **Plant community**
Course Location: University Campus
Class Times: Tuesday 10- 12
Prerequisites:
Faculty Web Page: http://www.aswu.sci.edu.eg

Course Description/Overview

Plant community deals with the distribution of natural vegetation in relation to different environmental conditions. What the course offers is a good introduction to the area of economic importance of plants such as the medicinal values of the natural vegetation covers. This course addresses the role of natural vegetation in the human life. In addition, it focuses on providing the students with knowledge on the climate and the alterations that may take place in the community structure due to the climatic change. Also, it discusses the importance of the natural vegetation in global biodiversity. Furthermore, the knowledge and skills provided to the students by studying this course are regarded as important information for climate change mitigation.

Course Learning Objectives

To provide a critical approach in the context of the environmental sciences for sustainability; b) to raise the abilities of learners in preparing for a sustainable future for decision makers. and c) to enable learners to identify risks and develop climate change adaptation strategies.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:
Discuss; the various aspects of the floristic composition in different regions.
Connect environmental sciences with the science of flora and plant community for sustainability.Apply principals of climate on the plant cover distribution.

Required Course Texts and Materials

Hands-out prepared by the instructor for the class
Text books: Plant community and Plant ecology

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

Grading Policy

Grades can be based on the following: (Example)

Final written exam	60%
Practical Exam.	30%
Class attendance/participation	10%
Total Points	**100**

Course Policies

Late Assignments

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect.

Dissability

N.A.

Important Dates to Remember

Course Schedule

Topic	No. of hours	Lecture	Tutorial /Practical
Historical notes	2	1	2
Factors affecting on all vegetate	4	2	4
Floristic category in world and Egypt	6	3	6
Mediterranean regions	2	1	2
Southern Eastern Desert	4	2	4
Nile valley	2	1	2
Weeds assembly	4	2	4

Crops, trees			
Study of natural vegetation habitats	2	1	2
Factors of habitats	2	2	4
Study of methods + theory of classification	2	3	6
Reorganization of special structure	2	1	2
Application about plant community	2	3	6
Practical applied of plant community	2	2	4

APENDIX I
Course Syllabus Adult education and environment work

Instructor Information
Instructor: ***Abd El Hay A. Mahmoud, Associate Prof.***
Office Location: ***Psychology Dept.Faulty of Education***
Office: ***Second floor, Main Building***
Telephone: ***Office +20 973481533***
Office Hours:
Cell: +201148685684
Sunday 12.30-4.00 pm, Wednesday 12.30 – 4.00 pm.

Email: ***agaderabdelhay@yahoo.com***

Website:

Course Identification

Course Number: ***312 T.R***

Course Name: ***Adult education and environment work***

Course Location: ***Faulty of Education, Class Building***

Class Times: ***10:00 – 12:00 pm, Saturday***

Faculty Web Page: *http://edu.aswu.edu.eg*

Course Description:

Adult education and environment work is a science, which aims to give a general idea about the importance of adult education and literacy as a requirement necessary for the development of society, especially in the current era, which is characterized as the era of knowledge. Adult environmental education can play an important role in sensitizing and mobilizing communities and decision-makers towards sustained environmental action. Environment, health, population, nutrition and food security are intricately linked to one another in sustaining development. Each is a complex issue. Caring for the environment by controlling pollution , preventing soil erosion and prudently managing natural resources has a direct impact on the population's health, nutrition and wellbeing which, in turn, have implications for population growth and the availability of food. These issues are part of the wider quest for sustainable development, which cannot be attained without a strong emphasis in education on family issues, the reproductive life cycle and population issues such as ageing, migration, urbanization, and intergenerational and family relations.

Course Learning Objectives:

- ***Knowledge of the concept of the environment and its relationship to humans and Adult.***
- ***The impact of Adult education on environment work .***
- ***Concludes the effect of environment work functions, and the performance of mental tasks .***

- ***Determine the relationship of Adult education and environment work.***
- ***Concludes the optimal form of the environment work and how to deal with it.***

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

7. ***Congestion and its impact on behavior and associated pressures.***
8. ***Adult education and environment work and the resulting affect the physiological functions, and perform mental tasks and psychological aspects.***
9. ***Adult education and environment work in terms of their relationship with the various functions on the human.***
10. ***Identify environmental problems of society.***
11. ***Learn practical ways to solve the environmental problems of society.***
12. ***Dealing good with the components of the environment.***

Required Course Texts and Materials:

Reference textbook for this course are:

- ***Abdel Fattah Dwedar (2010) Environmental Psychology. Alexandria: House new knowledge***
- ***SayedFahmi Ali (2005) Environmental Psychology. Alexandria: House new knowledge.***

- ***Contributions to psychology in solving the environmental problems of the environment and promotion of at*** *http://www.greenline.com.kw/ArticleDetails.aspx?tp=358*

- ***Abdul Rahman Mohammed Essawi (1997): in environmental psychology. Alexandria: plant knowledge***

In addition, selected publications in the fields relevant to the topics will be reviews and discussed extensively.

Assignments and Grading Scheme

Grading System
0 to 50 (where 25 is the least pass mark)

Grading Policy

Assignments	***10%***
Exams	***80%***
Class attendance/participation	***10%***
Total Points	***100***

Course Schedule

Week	***Date***	***Topics***
1		***Discussion of syllabus, assignments, and course requirements.***
2		***Knowledge of the concept of the environment and its relationship to adult and the interaction between them***
3		***The surrounding environment***

4		***The Adult education and environment work.***
5		***Adult education effects of environment work.***
6		***Ways to deal with environmental problems.***

Instructor Information

Instructor: Dr. Saied Mohamed Sedeek
Office Location: Aswan University Campus
Office: Aswan Faculty of Education
Telephone: Office +20 972262169
Office Hours: Saturday 12.30-2.00 pm, Wednsday 12.30 – 2.00 pm.
Email: saiedms73@yahoo.com
Website:
http://edu.aswu.edu.eg/Arabic/StaffMembers/Pages/StaffMemberData.aspx?StaffMemberID=P6VUlGJqSJx8OKmfZsa3ew%3d%3d

Course Identification

Course Number: **En. St. (1) 117 T.R.**
Course Name: Environmental Studies
Course Location: Aswan Faculty of Education (Classes Building)
Class Times: 12:00 – 2:00 pm, Sunday
Faculty Web Page: http://edu.aswu.edu.eg

Course Description:

environmental framework poses bio frame humans so it is preserved and maintenance of the most important foundations of a healthy life, and there are reports and studies warn of mass destruction awaits human because of the effects of the environment and climate has appeared many of the climatic changes that should be taken into account when teaching our students the skills to deal well with the environment supports the professional development of the most important: global warming, ozone, earthquakes, forest fires, hurricanes.

The course offers good introduction to the field of climate change and sustainable development is divided into six parts, the first concept of the environment, and the second environmental pollution concept and types, and the third climate change in terms of the definition, types and effects of economic, social and environmental, and the fourth deals with the environmental dimension of climate change, and the fifth is facing sustainable development and its role in the face of climate change, and the sixth is trying to provide possible solutions to address climate change, allowing refine and develop the skills of sustainable professional development.

Course Learning Objectives:

The course introduces students to our natural environment and the human interactions and everyday problems with our environment and global community from a environmental perspective. The overarching goals of this course are:

)a) To provide a critical approach to Sustainable Development supported new ways to cope with climate change.

)b) Increase awareness of the dangers of environmental pollution, climate change and access to citizen's rights and roles and responsibilities towards the future.

)c) Use of technology in order to reach the causes of climate change, describing it and stand on the terms of their occurrence.

)d) use of environmental resources and tools in the low-cost access to the optimum relationship between climate change and sustainable development.

(e) Provide explanatory entrance to the fields of education and environmental goals and environmental conservation diverse.

Course Content Learning Outcomes

Upon successful completion of this course, Students will be able to:

)a) Discusses the diverse knowledge for sustainable development in the face of the risks of climate change in order to survive and preserve the environment.

)b) linking Theories the environment with the causes of environmental pollution.

)c) Explain climate change in light of the diverse knowledge related to the objectives of environmental education and its fields.

)d) produce of a digital video clip for no more than 15 minutes to describe the diverse climatic changes.

)e) The use of social networking sites (Facebook and Twitter) to increase the awareness of community members climate change and the role of sustainable development in the face.

)f) Develop a scenario for a workshop with members of the local community where industrial products incorporate technology for environmental risks.

(g) Design brochures explain the possible solutions to overcome the risks resulting from potential climate changes in the community.

Required Course Texts and Materials:

Reference textbook for this course are:

1- Richard Alley (NAS), Department of Geosciences, Pennsylvania State University
2- ■■ Alec Broers FRS, Diamond Light Source and Bio Nano Consulting (Former President of the Royal Academy of Engineering)
3- ■■ Harry Elderfield FRS, Department of Earth Sciences, University of Cambridge
4- ■■ Joanna Haigh FRS, Imperial College London
5- ■■ Isaac Held (NAS), NOAA Geophysical Fluid Dynamics Laboratory
6- ■■ John Kutzbach (NAS), Center for Climatic Research, University of Wisconsin
7- Jerry Meehl, National Center for Atmospheric Research
8- ■■ John Pendry FRS, Imperial College London
9- ■■ John Pyle FRS, Department of Chemistry, University of Cambridge
10- ■■ Gavin Schmidt, NASA Goddard Space Flight Center
11- ■■ Emily Shuckburgh, British Antarctic Survey
12- ■■ Gabrielle Walker, Journalist
13- ■■ Andrew Watson FRS, University of Exeter
14- National Research Council, 2010a, Advancing the Science of Climate Change
15- National Research Council, 2010b, Limiting the Magnitude of Climate Change
16- National Research Council, 2010c, Adapting to the Impacts of Climate Change
17- National Research Council, 2011d, Informing an Effective Response to Climate Change
18- National Research Council, 2010e, Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean
19- https://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter9.pdf
20- report.mitigation2014.org/.../ipcc_wg3_ar5_summary-f...
21- www.pnas.org/content/early/2012/.../1205276109.full.p...
22- cdkn.org/.../2012/.../National-Climate-Change-Response-Strategy_April-...
23- www.ipcc-wg2.gov/SREX/images/uploads/SREX-All_FINAL.pdf

24- unctad.org/en/Docs/ditcbcc20092_en.pdf

Assignments and Grading Scheme

Grading System
0 to 150 (where 90 is the least pass mark)

Grading Policy

Assignments	10%
Exams	80%
Class attendance/participation	10%
Total Points	**100**

Course Schedule

Week	Date	Topics
1		Discussion of syllabus, assignments, and course requirements.
2		Environmental studies: Fundamental concepts and definitions.
3		environment and climate
4		concept of the environment

5		environmental pollution concept and types
6		climate change in terms of the definition, types and effects of economic, social and environmental
7		environmental dimension of climate change and professional development.

Course	**Environmental Geology**
Module 1	**Introduction**
Key Concepts	Environmental studies: Fundamental concepts and definitions
Overview	Environmental studies is the use of environmental information to help

	us solve conflicts in bio use, to minimize environmental problems, and to maximize the beneficial results of using our natural and modified environments. This module discusses the basic concepts and principles of environmental studies, and defines the commonly used terms and issues. The module provides general introduction to Environmental studies, environmental ethics, environmental Crisis and fundamental concepts of the environmental sciences
Aim	The overriding aim of this module is to turn students able to discourse on basic concepts and principles of environmental studies, definitions of commonly used terms and issues, and fundamental concepts that apply to all environmental sciences.
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss the different terms, concepts and principles of environmental studies. • Summarize the environmental ethics and crisis
Units	Unit 1.1: Introduction to Environmental studies. Unit 1.2: Environmental Ethics. Unit 1.2: Environmental Crisis. Unit 1.4: Fundamental Concepts of the Environmental Sciences.
Readings	Ecology: Concepts and Applications by Manuel Molles (Jan 13, 2012), Lundgren, L. W., 1999 Principles of Environmental Science: Inquiry and Applications by William Cunningham and Mary Cunningham (Dec 13, 2012)
Activity	What environmental studies means? Discuss the basic concepts of environmental studies? Write brief notes on environmental ethics and crisis?
Module 2	Environment and Climate
Key Concepts	Environment, Climate.

Overview	This module focuses on the Climate, Environment and relationship between them. The Module concentrates on the meaning of pollution and the types of them including air, water, noise, and ethics.
Aim	The overriding aim of this module is to enhance student understandings about the Environment, Climate, the relationship between them, and the types of poulltion.
Learning Outcomes	At the end of this module students will be able to: • Identify and discuss the Environment and Climate • Understand the process of pollution. • Recall the types of pollution.
Units	Unit 2.1: Environment. Unit 2.2: Climate. Unit 2.3: the relationship between Environment and Climate Unit 2.4: pollution: The meaning and the types.
Readings	Essential Environment: The Science behind the Stories (4th Edition) by Jay H. Withgott and Matthew Laposata (Sep 22, 2011) Environmental Science: Toward a Sustainable Future (12th Edition) by Richard T. Wright and Dorothy T. Boorse (Jan 18, 2013) Environment by Peter H. Raven, David M. Hassenzahl and Linda R. Berg (Dec 17, 2012) The Environment and You by Norman Christensen (Jan 7, 2012)
Activity	Where do volcanoes and earthquakes occur? What is the percent of fresh water on earth? How much carbon dioxide enters the Earth's atmosphere each day? What is carbon dioxide's residence time in the atmosphere? Define the three types of stress? What are the physical earth processes might cause each, and what strain would result? What are the differences between elastic and plastic deformations?
Module 3	Climate change in terms of the definition, types and effects of economic,

	social and environmental
Key Concepts	Climate change, and effects of economic, social and environmental
Overview	The module focuses on the meaning and causes of climate change --how they are formed and classified. The economic, social and environmental effects of climate change will be discussed.
Aim	The overriding aim of this module is to turn students able to understand the climate change in the light of environmental meaning and classify this pollutions (effects of economic, social and environmental).
Learning Outcomes	At the end of this module students will be able to: • Reveal knowledge on the climate • Identify the different between climate and environment. • Determinate the physical and engineering properties of soils
Units	Unit 3.1: Climate change Unit 3.2: The relationship between climate and environment Unit 3.3: Pollution.
Readings	Living in the Environment by G. Tyler Miller and Scott Spoolman (Jan 1, 2014) Understanding Environmental Pollution by Marquita K. Hill (May 24, 2010) Pollution by Marquita K. Hill (May 24, 2010) Air Pollution and Global Warming: History, Science, and Solutions by Professor Mark Z. Jacobson (Apr 23, 2012)
Activity	What are the main factors controlling climate? What are the criteria that used to classify pollutions? Define The economic, social and environmental effects of climate change?
Module 4	**Climate Change and Professional Development**

Key Concepts	Climate, Climate Change, and Professional Development.
Overview	The Next Generation Science Standards (NGSS) are the first set of U.S national science standards to explicitly include the topic of global climate change. With this new emphasis on climate change in K 12 science education 12-science education ,geosciences educators will likely play a central role in shaping a nation of citizens capable of understanding and making informed decisions about global climate change.
Aim	The overriding aim of this module is to turn students able to discourse on major types of climate change and the meaning of professional development.
Learning Outcomes	At the end of this module learners will be able to: • Identify the climate change and types of climate change. • Determine the concept of professional development. • Understand the types of professional development. • Discuss the effects of climate change and professional development.
Units	Unit 4.1: climate change. Unit 4.2: The types of climate change. Unit 4.3: The professional development. Unit 4.4: The relationship between climate change and professional development.
Readings	Experiences of Climate Change Adaptation in Africa (Climate Change Management) by Walter Leal Filho (Aug 8, 2011). Climate Change and Sustainable Development: New Challenges for Poverty Reduction by M. A. Mohamed Salih (Jul 2009)

Activity	List the common climate change and types climate change? Write brief notes on professional development? Summarize the relationship between climate change and professional development?

Instructor Information

Instructor: Dr. Adel Sayed Abbady
Office Location: Faulty of Education
Office: 319, 3rd floor, Labs Building of Faculty of Science
Telephone: Office +20 973481533
Office Hours: Sunday 12.30-4.00 pm, Wednsday 12.30 – 4.00 pm.
Email: adel_abbady@aswu.edu.eg
adel_abbady@yahoo.com
Website: http://sci.aswu.edu.eg/Staff/emam99/Pages/default.aspx
http://scholar.google.com/citations?hl=en&user=k4MA20wAAAAJ

Course Identification

Course Number: **107 T.R**
Course Name: Principals of Psychology
Course Location: Faulty of Education, Class Building
Class Times: 10:00 – 12:00 pm, Saturday

Faculty Web Page: http://sci.aswu.edu.eg

Course Description:
Environmental psychology is a science, which objectively studies the environment and what is shrouded in pollution, destruction and aggression or hit it from neglect, tampering, corruption, and subsequent farmland green of desertification and doom or dredging of soil and abuse it. So the damage which has become attached to the physical environment. Social man of the times became threatening to his health and even his life and the lives of all wildlife species. Man spends his hand on the aspects of his life and other objects and even destroys the physical environment itself, rather than working to beautify and improve good investment. As well as hit the environment as well as pollution and congestion and resulting pollution to the violation occurs in the ozone layer and the spread of diseases and epidemics, behavior of rights does not affect the environment only but also affect the composition and construction and development and in his character and his health and his illness and inclinations and abilities, intelligence and beliefs and ideas and concerns, and cares first part of the definition of and concept of Environmental of Psychology, and the second part The surrounding environment. The third part deals with psychological effects of pollution; Finally, Fourth part Environmental problems and solutions behavioral.

Course Learning Objectives:
- Knowledge of the concept of the environment and its relationship to humans and the interaction between them
- The impact of congestion on human behavior .
- Concludes the effect of noise on physiological functions, and the performance of mental tasks .
- Determine the relationship of light and weather, temperature and air pollution on various human functions.
- Concludes the optimal form of the environment and how to deal with it.

Course Content Learning Outcomes
Upon successful completion of this course, students will be able to:

13. Congestion and its impact on behavior and associated pressures.
14. Noise and noise pollution and the resulting affect the physiological functions, and perform mental tasks and psychological aspects.
15. Light, weather, temperature and air pollution in terms of their relationship with the various functions on the human.

16. Identify environmental problems of society.
17. Learn practical ways to solve the environmental problems of society.
18. Dealing good with the components of the environment.

Required Course Texts and Materials:
Reference textbook for this course are:

- Abdel Fattah Dwedar (2010) Environmental Psychology. Alexandria: House new knowledge
- SayedFahmi Ali (2005) Environmental Psychology. Alexandria: House new knowledge.
- Contributions to psychology in solving the environmental problems of the environment and promotion of at http://www.greenline.com.kw/ArticleDetails.aspx?tp=358
- Abdul Rahman Mohammed Essawi (1997): in environmental psychology. Alexandria: plant knowledge

In addition, selected publications in the fields relevant to the topics will be reviews and discussed extensively.

Assignments and Grading Scheme

Grading System
0 to 50 (where 25 is the least pass mark)

Grading Policy

Assignments	10%
Exams	80%
Class attendance/participation	10%
Total Points	**100**

Course Schedule

Week	Date	Topics

1		Discussion of syllabus, assignments, and course requirements.
2		Knowledge of the concept of the environment and its relationship to humans and the interaction between them
3		The surrounding environment
4		The psychology of pollution.
5		Psychological effects of pollution.
6		Ways to deal with environmental problems.

Course	**Environmental Psychology**
Module 1	**Introduction**
Key Concepts	The concept of the environment and its relationship to humans and the interaction between them.
Overview	Environment word commonly used significance associated pattern of relationship between them and her employer, we say: AGRO environment, and the industrial environment, the environment and health, the environment and social and cultural environment, and political..., This means that the relationship of human activities related to these areas ...
Aim	The overriding aim of this module is to turn students able to discourse on basic concepts and principles of environmental psychology, definitions of commonly used terms and issues, and fundamental concepts that apply to all environmental of psychology.
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss the different terms, concepts and principles of environmental psychology. • Summarize the environmental ethics and crisis
Units	Unit 1.1: Introduction to Environmental psychology. Unit 1.2 Components and elements of the environment. Unit 1.2: Man and role in the environment.
Readings	- Abdel Fattah Dwedar (2010) Environmental Psychology. Alexandria: House new knowledge. - Abdul Rahman Mohammed Essawi (1997): in environmental psychology. Alexandria: plant knowledge

Activity	What environmental psychology means? Discuss the basic concepts of environmental psychology?
Module 2	Surrounding Environment
Key Concepts	human behavior, positive behavior, popular participation
Overview	Strain influence of the surrounding environment. Specific features of the surrounding environment Response to the surrounding environment.
Aim	The overriding aim of this module is to enhance student understandings about the concept of burden on the environment as well as the climate, altitude, temperature, light, color and noise.
Learning Outcomes	At the end of this module students will be able to: • Identify and discuss the human behavior towards the environment
Units	Unit 2.1: surrounding environment. Unit 2.2: human behavior.
Readings	- Kazem Mikdadi, environmental education, www.ao-academy.org - Abdul Rahman Mohammed Essawi (1997): in environmental psychology. Alexandria: plant knowledge.
Activity	What are the components of the surrounding environment?
Module 3	Environmental Pollution
Key Concepts	Environmental Pollution, Physical environment
Overview	Environmental factors Cause, such as the various pollutants and natural disasters such as storms, earthquakes and other, in many of the negative effects on human behavior. It is so noise pollution or noise.
Aim	The overriding aim of this module is to turn students able to understand the types of environmental pollution, and the impact of environmental pollution on human.
Learning Outcomes	At the end of this module students will be able to: • Know the types of environmental pollution . • Knowledge of the impact of environmental pollution on human • Physical environment and work performance.
Units	Unit 3.1: Environmental pollution Unit 3.2: The impact of environmental pollution on human Unit 3.3: Physical environment

Readings	- Abdel Fattah Dwedar (2010) Environmental Psychology. Alexandria: House new knowledge. - Abdul Rahman Mohammed Essawi (1997): in environmental psychology. Alexandria: plant knowledge
Activity	What are the main factors of environmental pollution? What are the impact of environmental pollution on human? Define the Physical environment?
Module 4	**Environmental problems and solutions behavioral**
Key Concepts	Environmental problems, solutions behavioral
Overview	Slope failure, also referred to as mass wasting, is the down-slope movement of rock debris and soil in response to gravitational stresses. This module focuses on the types of mass wasting classified based on the type of down-slope movement. The types of movement, falls, slides, and flows are covered in this module. In addition, another type of ground failure and subsidence are covered.
Aim	The main objective of this unit is to transform the view of students toward the environment.
Learning Outcomes	At the end of this module learners will be able to: • Environmental technology and behavioral problems. • Environmental problems associated with health. • Resource problem. • Individual differences in environmental care and reaction.
Units	Unit 4.1: Environmental and behavioral problems Unit 4.2: Ways to deal with environmental problems.
Readings	McAndrew, F. T. (1992) Environmental Psychology. - Abdel Fattah Dwedar (2010) Environmental Psychology. Alexandria: House new knowledge.
Activity	What are Environmental problems associated with health? Define the Environmental technology?

APENDIX I:

Course Number:

Community health

University of Aswan, Faculty of social work, Department of social planning,

Spring Semester, 2013-2014

Instructor Information

Instructor:	Dr Modather Seleem
Office Location:	Aswan University Campus
Telephone:	Office 002 097 0380336
Office Hours:	Monday 14.30- 17.00, Thursday 14.00 – 16.00
E-mail:	bosy52@yahoo.com
Website:	

Course Identification

Course Number:	
Course Name:	Community health
Course Location:	University Campus
Class Times:	Wednesday 9:30pm – 12:30am
Prerequisites:	accepted in the first year in social work faculty
Faculty Web Page:	http://sworks.aswu.edu.eg/Arabic/Pages/default.aspx

Community health care approach to the deployment of health education and awareness about health and social problems prevailing in the community and work to put the appropriate methods to control and eliminate the participation of the community. Through health education and urged the people to embrace the lifestyle and practices of permanent health is specialized to change the views of the individual and society and their behaviour to improve the level of health, and the health of the people should be their responsibility to themselves and the war against diseases for health can not be fought by doctors only, but the battle of the people that must be waged by peoples collectively, which underlines the need for active participation of citizens and for the mutual benefit between the doctor and the community.

The community health approach on three key objectives of: The acquisition of health information. Urged the people to change the erroneous concepts of health. Directing the community to follow proper health behaviour. The approach addresses the health of the community the following sections: Identify the concept of health and disease, and multiple diseases, and the health system in the Egyptian society, and the impact of climate change on the health of individuals and the community and Social Work posts in the face of different diseases and spread awareness among residents of the community.

Course Learning Objectives

The overarching goals of this course are:

1 - Development of awareness among members of the community of the importance of health awareness and prevention of different diseases that affect the general health of the individual and society.

2 - To identify the posts in the community to provide access to appropriate care for members of the community so as to maintain the human entity and achieve growth and stability.

3 - Increase awareness among members of the community and how different diseases take appropriate measures to maintain the health of those human diseases.

4- Understand the impact of climate change on human health and the community and how to keep pace with changes including multiple does not affect human health..

5- Clarify the roles of social Work in health awareness and develop the capacity of members of the community to cope with multiple health problems

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

23. The acquisition of information about the overall health of the individual and society.
24. Learn the basics of primary health care for the individual and society.
25. Knowledge of the most important health problems and diseases suffered by members of the community.
26. The study of the environment changes and different climate and its impact on the health of the individual and society.
27. To identify the contribution of social service in spreading health awareness among members of the community.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

رشاد أحمد عبد اللطيف: الخدمة الاجتماعية البيئية, (القاهرة, بدون، 1998)

جمال شحاتة حبيب: المفاهيم البيئية، فى جمال شحاتة وآخرون: "الإنسان والبيئة فى إطار مهنة الخدمة الاجتماعية"، (القاهرة: بل برنت للطباعة والتصوير، 1996)

أحمد محمد السنهورى، طه عبد العزيز الديب: الخدمة الاجتماعية في مجال حماية البيئة والسكان من التلوث (القاهرة, مركز الكتاب بجامعة حلوان ، 1986)

محمد يسرى دعبس: تلوث البيئة وتحديات البقاء، رؤية انثروبولوجية, (الإسكندرية, بدون، 1997) ص ص25–26.

محمد منير حجاب : التلوث وحماية البيئة، قضايا البيئة من منظور إسلامي، ط1, (القاهرة, دار الفجر للنشر والتوزيع، 1999)

أسامة الخولي : البيئة وقضايا التنمية والتصنيع ,سلسلة عالم المعرفة,العدد 285, (الكويت, المجلس الوطني للثقافة والفنون والآداب,2002)

Sines, D., Appleby, F. M., & Frost, M. (2005). Community health care nursing (3rd ed.). Oxford, UK ; Malden, MA: Blackwell Pub.

Wakerly, R. T., & First Consulting Group. (1994). Community health information networks : creating the health care data highway. Chicago: American Hospital Pub.

Holzemer, S. P., & Klainberg, M. B. (2014). Community health nursing : an alliance for health (2nd ed.). Burlington, MA: Jones & Bartlett Learning.

Bensley, R. J., & Brookins-Fisher, J. (2009). Community health education methods : a practical guide (3rd. ed.). Sudbury, Mass.: Jones and Bartlett Publishers.

Cropper, S. (2007). Community health and wellbeing : action research on health inequalities. Bristol, UK: Policy Press.

Minkler, M., & Wallerstein, N. (2003). Community based participatory research for health. San Francisco, CA: Jossey-Bass.

http://health.jbpub.com/communityhealth/7e/

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	15/2/2012	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	22/2	Introduction to Community Health
3	29/2	Healthcare in the community
4	7/3	Community Health Assessment
5	14/3	Race, Ethnicity and Health
6	21/3	Issues in Global Health
7	28/3	Community Health Program Planning
8	4/4	Women and Health
9	25/4	Health Ethics and Policy

10	2/5	Community Action in Public Health
11	9/5	Psychoactive Drugs: Issues, Policies, and Intervention
12		Public Health in the Global Economy
13		Social Networks and Social Support
14		climate change in the community health

APENDIX I:

Course Number:

Introduction to Social planning

University of Aswan, Faculty of social work, Department of social planning,

Spring Semester, 2013-2014

Instructor Information

Instructor:	Dr. Kawther Kenawy
Office Location:	Aswan University Campus
Telephone:	Office 002 097 0380733
Office Hours:	Wednesday 14.30- 17.00, Monday 14.00 – 16.00
E-mail:	kelqenawi@aswu.edu.eg
Website:	

Course Identification

Course Number:	
Course Name:	Introduction to Social planning
Course Location:	University Campus
Class Times:	Thursday 9:30pm – 12:30am
Prerequisites:	accepted in the first year in social work faculty
Faculty Web Page:	http://sworks.aswu.edu.eg/Arabic/Pages/default.aspx

Course Description/Overview

Planners often have the challenge of serving the "public". How can a planner best serve a public which has diverse needs and values based on age, gender, ethnicity and cultural background? In addition, how do planners trained in land use planning account for and address social issues such as homelessness, housing affordability, environmental racism and the increased privatization of space? While social planning was an important and central focus of the urban planning discipline in the 1970's, today it is barely mentioned or studied within academia or at the local and regional level. Yet, social issues and challenges are just as prevalent today. Our urban communities continue to face the challenging issues of homelessness, affordable housing, and environmental justice. In addition, our populous has become more diverse spanning a wide variety of cultures and backgrounds, each bringing a distinctive set of perspectives and needs. Social planning is the practice of identifying and addressing the needs of various segments of the population to ensure that all have an equal opportunity to both change their environment and benefit from it. The purpose of this course is to analyze social planning theory

and practice at the local, regional and national level. This course will also entail a contemporary study of social issues and problems commonly encountered in an urban environment and how they're integrated into and addressed through the practice of land use planning. Included subjects of discussion and analysis
shall include: planning theory, planning for age (young and elderly), gender, race, and plan implementation.

Course Learning Objectives

The overarching goals of this course are: a) to Incorporate the knowledge of different planning theories and paradigms in approaching the urban planning process, be able to identify how the plan-making (comprehensive planning) process accounts for differences in society; b) Identify different segments of the population differentiated by race, age, and gender and their distinctive needs and concerns with respect to living and working in the urban environment.; c) Evaluate development plans and general plans with a critical eye to identify how they have accounted for the distinctive needs of different segments of the public, distinguished by age, race, and gender ;d) Prepare development plans and general plans incorporating a plan making process that accounts for and incorporates the needs of different segments of the population ;e) Find resources to develop solutions to social issues or problems, and an aptitude to plan an appropriate solution with tangible results ;f) Find resources to develop solutions to the issues and problems of climate change.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Incorporate the knowledge of different planning theories and paradigms in approaching the urban planning process, be able to identify how the plan-making (comprehensive planning) process accounts for differences in society.
2. Identify different segments of the population differentiated by race, age, and gender and their distinctive needs and concerns with respect to living and working in the urban environment.
3. Evaluate development plans and general plans with a critical eye to identify how they have accounted for the distinctive needs of different segments of the public, distinguished by age, race, and gender.
4. Prepare development plans and general plans incorporating a plan making process that accounts for and incorporates the needs of different segments of the population.

5. Find resources to develop solutions to social issues or problems, and an aptitude to plan an

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

طلعت مصطفي السروجي: ثلاثية التنمية البشرية و نوعية الحياة والتحديث"كمدخل لإستراتيجية والية التخطيط الاجتماعي ، بحث منشور في المؤتمر العلمي الرابع عشر , كلية الخدمة الاجتماعية بالفيوم , جامعة القاهرة , مايو 2003.

مني عويس، عبلة الافندي :التخطيط للتنمية الاجتماعية ,مكتبة النهضة المصرية , القاهرة ,1997.

Fulton, William. “Introduction: How Planning in California Really Works” in Guide to California Planning. Chapter 1, 2005.
Levy, John M. “The Social Issues” in Contemporary Land Use Planning, 9th Edition.
2011

Hays, Samuel & Broughton, Samuel. The progressives and the slums; tenement house reform in New York City, 1890-1917. Chapter 8. 1962

Jacobs, Jane. “The Death and Life of Great American Cities”. Readings in Planning Theory, Chapter 2. 2003.

Sandercock, Leonie “The Difference that Theory Makes” in Towards Cosmopolis: Planning for Multicultural Cities. Chapter 4. 1998.

Checkoway, Barry “Paul Davidoff and Advocacy Planning in Retrospect” and Clavel,
Pierre “The Evolution of Advocacy Planning” both in Journal of the American Planning Association; Spring 1994. Vol. 60, No. 2.

Innes, Judith E. & Booher, David E. “Collaborative Policy Making: Governance
Through Dialogue,” Chapter 1 in Deliberative Policy Analysis: Understanding Governance in the Network Society, Hajer, Maarten and Hendrik Wagenaar eds., Cambridge University Press. 2003.

Andrews, James H “Leisure Power” in Planning (Nov 1999): p4

Howe, Deborah et. all, Planning for an Aging Society Planning Advisory Service Report Number 451. 1994. Chapters 1-3

Multigenerational Planning: Family Friendly Communities Briefing Papers – American Planning Association. 2011

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course

		modules)
1	15/2/2012	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	22/2	Introduction
3	29/2	What is Social Planning?
4	7/3	History of Social Planning
5	14/3	Social Planning Theory
6	21/3	Planning / Design
7	28/3	Social Planning Issues - Homelessness
8	4/4	Social Planning Issues- Affordable Housing
9	25/4	Social Planning Issues- Environmental Justice
10	2/5	Social Planning Issues– climate change
11	9/5	Sustain policy and social planning for climate change

APENDIX I:

Course Number:

Introduction to Social Welfare

University of Aswan, Faculty of social work, Department of community organization,

Spring Semester, 2013-2014

Instructor Information

Instructor:	Dr. Mohamed Gaber Abaas
Office Location:	Aswan University Campus
Telephone:	Office 002 097 03841212
Office Hours:	Sunday 14.30- 17.00, Monday 14.00 – 16.00
E-mail:	m.g.abaas@aswu.edu.eg
Website:	

Course Identification

Course Number:	
Course Name:	Introduction to Social Welfare
Course Location:	University Campus
Class Times:	Wednesday 9:30pm – 12:30am

Prerequisites: accepted in the first year in social work faculty

Faculty Web Page: http://sworks.aswu.edu.eg/Arabic/Pages/default.aspx

Course Description/Overview

This course surveys the history of social welfare , services, and the relation between social work and social welfare.It explores current social welfare issues in the context of their history and the underlying rationale and values that support different approaches. The course considers implicit and explicit values of societal responses to human needs. From an examination of selected topics in social welfare, the course considers social, economic, ethical, religious, and/or personal values as they affect and are affected by social welfare. The first section addresses the basics of social welfare such as concepts, goals, philosophy, principles, functions, directions, fields . The second section discusses the social welfare in the great civilizations such as ancient Egypt, grace, roman. The third section focuses on social welfare in religious specially in the Islam. The fourth section discusses the social welfare around the world. The five section addresses social welfare in the Egyptian society , The sex section addresses the relation between social work and social welfare, The seven section discusses the social welfare under the climate change, which changed in the programs and services.

Course Learning Objectives

The overarching goals of this course are: a) to provide a description of the historical basis for the current social welfare system, including the history and role of the social work profession; b) Discuss the strengths and limitations of the current social welfare system in terms of the functions of the provision of basic needs, protection of the vulnerable, prevention, promotion, treatment, rehabilitation, protection of society, and provision of social control; c) raise awareness of the major fields of social welfare service provision from a multicultural perspective, including but not limited to income security, health and mental health services, child welfare, educational practices, services to the elderly, and corrections ;d) analyze current debates, trends, and ethical issues in each specific field of service presented in the course including the implications for social welfare practice and promoting social policies in the field of climate change.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Discuss the various basics of social welfare such as concepts, goals, philosophy, principles, functions, directions, fields .
2. make great knowledge about social welfare in the great civilizations such as ancient Egypt, grace, roman, and in the religious specially in the Islam. social welfare around the world.social welfare in the Egyptian society.
3. Discuss the relation between social work and social welfare,
4. Demonstrate awareness and ability to work in the social welfare under the climate change .

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

بدر الدين كمال و محمد جابر عباس (2012). مقدمة في الرعاية الاجتماعية,القاهرة, دار النهضة المصرية

عبد الحليم رضا عبد العال وآخرون .(2000).الرعاية الاجتماعية في الخدمة الاجتماعية, القاهرة :قسم تنظيم المجتمع كلية الخدمة الاجتماعية جامعة حلوان.

ماهر أبو المعاطي علي.(2009).الاتجاهات الحديثة في الرعاية الاجتماعية ,الإسكندرية:المكتب الجامعي الحديث.
محمد سيد فهمي.(2008).الرعاية الاجتماعية بين حقوق الإنسان وخصخصة الخدمات, الإسكندرية:دار الوفاء لدنيا الطباعة والنشر.

محمد عبد الفتاح محمد , أميرة منصور يوسف.(1994). الأسس النظرية للرعاية الاجتماعية, الإسكندرية:المكتب العلمي للكمبيوتر والنشر والتوزيع.

نبيل محمد صادق وآخرون.(2007).رؤي نظرية في الرعاية الاجتماعية " أسس ونماذج عربية ومصرية",القاهرة ,دار المهندس للطباعة.

Blau, J., & Abramovitz, M. (2004). The Dynamics of Social Welfare Policy: Oxford University Press.

Midgley, J. (1997). Social Welfare in Global Context: SAGE Publications.

Patti, R. J. (2000). The Handbook of Social Welfare Management: SAGE Publications.

Olsson, T. M. (2010). Comparing top-down and bottom-up costing approaches for economic evaluation within social welfare. Eur J Health Econ.

Ambrosino, R. (2008). Social work and social welfare : an introduction (6th ed.). Belmont, CA: Thomson Brooks/Cole.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course

		modules)
1	15/2/2012	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	22/2	basics of social welfare such as (1) concepts, goals, philosophy,
3	29/2	basics of social welfare such as (2) principles, funct directions, fields
4	7/3	social welfare in the ancient Egypt
5	14/3	social welfare in the great civilizations such asgrace, roman
6	21/3	social welfare in religious
7	28/3	social welfare in Islam
8	4/4	social welfare around the world
9	25/4	social welfare in the Egyptian society
10	2/5	the relation between social work and social welfare
11	9/5	social welfare under the climate change

APENDIX I:

Course Number:

Populations and Environmental Studies

University of Aswan, Faculty of social work, Department of social planning,

Spring Semester, 2013-2014

Instructor Information

Instructor: Dr. Mohamded Abdel- Razik
Dr. Mohamed Sayed

Office Location: Aswan University Campus

Telephone: Office 002 097 0380733

Office Hours: Wednesday 14.30- 17.00, Monday 14.00 – 16.00

E-mail: dr.mohamed99990@hotmail.com and acd99990@aswu.edu.eg

Website:

Course Identification

Course Number:

Course Name: Populations and Environmental Studies

Course Location: University Campus

Class Times:	Thursday 9:30pm – 12:30am
Prerequisites:	accepted in the first year in social work faculty
Faculty Web Page:	http://sworks.aswu.edu.eg/Arabic/Pages/default.aspx

Course Description/Overview

Environment is the framework in which they live rights and gets him on the elements of his life, food, clothing, medicine, shelter and exercise their relationships with peers, and in light of this sense, the environment is not just the natural elements (water, air, soil, minerals, plants, animals and energy sources) but they are also the balance of material resources and social available at some time, and somewhere to satisfy human needs and aspirations, and this we will address this decision (environmental studies and population) through the following sections: the first section addresses the definition of the environment and its characteristics, the second section deals with identifying the relationship between man and the environment and environmental problems and ways to address those problems , and Your first category III deals with the study of environmental pollutants and how to combat these pollutants and the fourth section addresses the role of social Work and tread different in the face of environmental problems, and the fifth section deals with the study of population and demographic characteristics of the population as well as to identify the problems of population and ways to address them, in addition to the study of the various factors that affect the environment The population in the light of climate change in order to achieve sustainable development and contribute to the achievement of stability within the different communities.

Course Learning Objectives

The overarching goals of this course are:

1 - Development of awareness of the importance the study of environmental problems and work to find the appropriate solutions in the light of environmental standards, which would contribute to the stability and sustainable development and cope with various changes.

2 - Improve the relationship between man and the environment surrounding it through the best investment of resources and facilities available, including not affect the natural environment and to achieve development and maintains the ecological balance and environmental components.

3 - Development of awareness of the importance of studying the problems of population and work on investment of human resources in order to achieve stability and contribute to the development of communities under various changes and scientific progress.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify the characteristics of the environment and natural components and the mutual influence between living and non-living .
2. Discuss the relationship between man and the environment and the impact of human environmental factors.
3. Identify the various environmental problems and how to address them and work to achieve ecological balance between man and the environment surrounding it.
4. Identify the types of environmental pollutants and its impact on human life and the ways to combat these pollutants. Develop a lesson plan that integrates the produced digital artefact.
5. Identify the demographics of the community and address the problems of the mechanics of the population increase.
6. Discuss methods of investment of human resources to achieve growth and sustainable development.
7. Display some videos related to environmental problems and population.
8. Recognize the contribution of social work in the face of environmental problems and population and to help achieve stability within communities

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

نهى الخطيب : اقتصاديات البيئة والتنمية , سلسلة أوراق غير دورية(القاهرة , دار غريب,2000)

محمد نجيب توفيق : الخدمة الاجتماعية فى مجال حماية البيئة من التلوث, (القاهرة ,مركز الكتاب بجامعة حلوان ، 1988)

إبراهيم بيومى مرعى، جمال شحاتة حبيب: الخدمة الاجتماعية والتحديات البيئية،(جامعة القاهرة, كلية الخدمة الاجتماعية فرع الفيوم, المؤتمر العلمي العاشر ، 1997)

إبراهيم بيومى مرعى، ملاك أحمد الرشيدى: دراسات بيئية من منظور الخدمة الاجتماعية، (القاهرة, مركز نور الإيمان، 1999)

محمد عامر أبو المجد: دور الخدمة الاجتماعية فى حماية البيئة، (الإسكندرية, دار المعرفة الجامعية، 1996)

علي عبدالرزاق جلبي، 1998 ، علم اجتماع سكان، دار المعرفة الجامعية، الاسكندرية.

عبدالله الخريجي ومحمد الجوهري. 1979. مقدمة في السكان . دار الشروق، جده

فتحي ابو عيانه .1985، دراسات في علم السكان، دار النهضة العربية، بيروت

Fulton, William. “Introduction: How Planning in California Really Works” in Guide to California Planning. Chapter 1, 2005.

http://www.springer.com/social+sciences/population+studies/journal/11111

https://www.springer.com/?SGWID=0-102-2060-0-0

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave

early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	15/2/2012	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	22/2	the definition of the environment and its characteristics
3	29/2	identifying the relationship between man and the environment
4	7/3	identifying the relationship between environmental problems and ways to address those problems ,
5	14/3	the study of environmental pollutants

6	21/3	the study of how to combat these pollutants
7	28/3	role of social Work and tread different in the face of environmental problems
8	4/4	study of population and demographic characteristics of the population
9	25/4	identify the problems of population and ways to address them
10	2/5	study of the various factors that affect the environment
11	9/5	study of the various factors that affect the environment and The population in the light of climate change

APENDIX I:

Course Syllabus

Course Number:

Rural and Urban Sociology

University of Aswan, Faculty of social work, Department of Social planning,

Spring Semester, 2013-2014

Instructor Information

Instructor: Dr. Mohamed Nagdy Sayed

Office Location: Aswan University Campus

Telephone: Office 002 097 03840733

Office Hours: Monday 14.00- 16.30, Tuesday 14.00 – 16.00

E-mail: nagdy59@aswu.edu.eg

Website:

Course Identification

Course Number:

Course Name: Rural and Urban Sociology

Course Location: University Campus

Class Times: Thursday 9:30pm – 12:30am

Prerequisites: accepted in the first year in social work faculty

Faculty Web Page: http://sworks.aswu.edu.eg/Arabic/Pages/default.aspx

Course Description/Overview

The course aims to help students understand the rich diversity in rural society, with an emphasis on the interdependencies between urban and rural contexts. Current issues and social problems experienced by rural populations and how sociology is used to understand and address issues affecting rural communities are explored.

This course explores social life along the rural-urban continuum. We will examine differences and similarities in social behaviour, organization and ecology. An overview of social science perspectives pertaining to the interaction between human behaviour, social organization, and various dimensions of both natural and "built" environments will be provided. Upon developing a sociological understanding of rural, we will consider topical issues that often transcend the rural-urban continuum. In examining these and other related issues, Students completing the course should leave with an enhanced awareness of how humans interface with their environments, and why planned development efforts need to consider that interface in order to maximize the degree of congruence between environmental conditions and the needs and preferences of humans who live and work in those environments.

The first section addresses the concept of Sociology. The second section discusses the definitions of Rural and Urban Sociology. The third section focuses on historical background of Rural and Urban Sociology. The fourth section discusses the theories of Rural and Urban Sociology. The five section addresses scientific schools in Rural and Urban Sociology, The sex section addresses the how to work with Rural and Urban society , The seven section discusses the role of Rural and Urban Sociology in the facing the challenges of climate change.

Course Learning Objectives

The overarching goals of this course are: a) to provide a description of terminology and concepts used in the study of urban and rural sociology, including the Define concepts such as society/ civilization/ city/ suburb/ rural; b) Review the theoretical foundation of humans living in cities and villages; c) Discuss the failure of centrally planned totalitarian cities and villages ;d) Examine the social life in urban and rural spaces and the influence of the urban environment on human behaviour; e) Discuss city-living issues such as corrupt zoning, gerrymandering, red-lining, urban redevelopment, eminent domain for roads and highways, urban redevelopment, price fixing for rents and groceries, war against youth, over policing, under policing, climate change. etc

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. As a result of taking this course, students will have gained a social science understanding of rural and urban issues.
2. Students will be able to demonstrate critical thinking through oral and written formats, assess the complexity of rural and urban issues.
3. Students will be able to apply sociological theories and methodologies to the study of rural and urban issues.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

مسعد الفاروق محمد حمودة: تنمية المجتمعات المحلية "الريفية – الحضرية – المستحدثة – الصحراوية" ، المكتب العلمى للكمبيوتر والنشر والتوزيع، الاسكندرية ,1995.

حسين عبد الحميد احمد رشوان: مشكلات المدينة"دراسة في علم الاجتماع الحضري", مؤسسة شباب الجامعة, الاسكندرية, 2005.

jawharī, M., & Shukrī, A. (1980). **علم الاجتماع الريفي و الحضري :دار المعارف،.**

American Sociological Association Task Force on Assessing the Undergraduate Sociology Major. 2005. Creating an Effective Assessment Plan for the Sociology Major. Washington, DC: American Sociological Association.

Beaulieu, Lionel J. 2005. "Breaking Walls, Building Bridges: Expanding the Presence and Relevance of Rural Sociology." Rural Sociology 70(1):1–27.

Browne, W.P., J.R. Skees, L.E. Swanson, P.B. Thompson, and L.J. Unnevehr. 1992. "Never

confuse farming with Rural America" Pp. 17-35 in Sacred Cows and Hot Potatoes: Agrarian Myths in Agricultural Policy. Boulder, CO: Westview Press.
Fitchen, J.M. 1991. "What then is rural? Challenges to rural and community identity" Pp. 245-265 in Endangered Spaces, Enduring Places: Change, Identity, and Survival in Rural America. Boulder, CO: Westivew Press.
Gallardo, R. 2010. "Rural America in the 2000s: Population" The Daily Yonder accessed online at http://www.dailyyonder.com/rural-america-2000s-population/2010/07/12/2834
Johnson, K. 2003. "Unpredictable directions of rural population growth and migration" Pp. 19-42 in D. Brown and L. Swanson (eds.) Challenges for Rural America in the 21st Century. University Park, PA: Penn State University Press.

Bridger, J.C., A.E. Luloff, and R.S. Krannich. 2002. "Community change and community theory" Pp 9-21 in A.E. Luloff and R.S. Krannich (eds.) Persistence and Change in Rural Communities: A Fifty Year Follow-Up to Six Classic Studies. New York, NY: CABI Publishing
Wilkinson, K.P. 1991. "The community and rural well-being" Pp. 61-79 in The Community in Rural America. Middleton, WI: Social Ecology Press.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course

		modules)
1	15/2/2012	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	22/2	concept of Sociology
3	29/2	definitions of Rural and Urban Sociology
4	7/3	historical background of Rural and Urban Sociology
5	14/3	the theories of Rural Sociology
6	21/3	the theories of Urban Sociology
7	28/3	scientific schools in Rural Sociology
8	4/4	scientific schools in Urban Sociology
9	25/4	how to work with Rural and Urban society
10	2/5	the role of Rural and Urban Sociology in the facing the recent problems and issues
11	9/5	the role of Rural and Urban Sociology in the facing the challenges of climate change

APENDIX I:

Course Syllabus

Course Number:

Social work in one of the developed fields (environment)
University of Aswan, Faculty of social work, Department of social work fields,
Spring Semester, 2013-2014

Instructor Information

Instructor: Prof. Dr Ali Dandarawy
Office Location: Aswan University Campus
Telephone: Office 002 097 0380690
Office Hours: Sunday 14.30- 17.00, Monday 14.00 – 16.00
E-mail: Dandarawy318@hotmail.com
Website:

Course Identification

Course Number:
Course Name: Social work in one of the developed fields (environment)
Course Location: University Campus

Class Times:	Wednesday 9:30pm – 12:30am
Prerequisites:	accepted in the first year in social work faculty
Faculty Web Page:	http://sworks.aswu.edu.eg/Arabic/Pages/default.aspx

Course Description/Overview

This course covers the Social Work in the field of environment and sustainable development and to support community-based organizations working in the field of environment. And is aimed at addressing environmental issues and changes thereto affect the stability and hinder the growth, progress and sustainable development as the focus of this course to support community-based organizations working in the field of environmental protection and spread awareness among members of the community and support of volunteerism, which would contribute to the improvement of the environment and to achieve stability and desired progress and deals with this scheduled the following sections: the concept of Social Work in the field of environmental protection, the goals of Social Work in the field of environmental protection, Social Work posts in achieving social development, contributions to civil society organizations in the field of environmental protection. This course also addresses the issues of climate change and its impact on the albino and how to contribute to the growth of environmental commensurate with the requirements of climate change and sustainable development.

Course Learning Objectives

The overarching goals of this course are:

1 - Development of environmental awareness as one of the areas developed in the Social Work and determines the appropriate methods to protect the environment from multiple problems.

2 - Increasing the information associated with the protection of the environment and ways to optimize the investment environment of resources in order to achieve stability and sustainable development and caring members of society.

3 - To identify the contribution of civil society organizations in the field of environmental protection and the mechanisms to support those organizations to contribute to the achievement of stability and social development

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

28. The acquisition of information related to the field of protection of the environment and how to preserve the environment of the different climate changes.

29. To identify the organizations working in the field of environmental protection and the mechanics of working through those organizations to protect the environment.
30. To identify the contribution of social service in the field of environmental protection as one of the areas developed in the Social Work.
31. Identify the goals of Social Work in the field of environmental protection.
32. Identify mechanisms to support organizations working in the field of environmental protection and to stabilize the environment and sustainable development.
33. Determine the plans, programs and strategies appropriate to the development environment commensurate with the climate change and achieving environmental stability
34. A showcase of some of the experiences in the field of environmental protection and how to employ them in proportion to the different climate changes

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

محمد عامر أبو المجد: دور الخدمة الاجتماعية فى حماية البيئة، (الإسكندرية, دار المعرفة الجامعية، 1996)

رشاد أحمد عبد اللطيف: الخدمة الاجتماعية البيئية, (القاهرة, بدون، 1998)

جمال شحاتة حبيب: المفاهيم البيئية، فى جمال شحاتة وآخرون: "الإنسان والبيئة فى إطار مهنة الخدمة الاجتماعية"، (القاهرة: بل برنت للطباعة والتصوير، 1996)

أحمد محمد السنهورى، طه عبد العزيز الديب: الخدمة الاجتماعية فى مجال حماية البيئة والسكان من التلوث (القاهرة, مركز الكتاب بجامعة حلوان ، 1986)

Mel Grayhttp://www.amazon.com/Environmental-Social-Work-Mel-Gray/dp/0415678129 (Editor), John Coates (Editor), Tiani Hetheringto.( ). Environmental Social Work

Lena Dominelli.(2012). Green Social Work: From Environmental Crises to Environmental Justice

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course

		modules)
1	15/2/2012	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	22/2	Introduction the concept of Social Work in the field of environmental protection
3	29/2	Social Work posts in achieving social development
4	7/3	contributions to civil society organizations in the field of environmental protection.
5	14/3	Environmental Crises, Social Conflict and Mass Migrations
6	21/3	Interrogating World Views: From Unsustainable to Sustainable Ways of Reframing Peoples' Relationships to
7	28/3	Climate Change, Renewable Energy and Solving Social Problems
8	4/4	climate change and its impact on the environment
9	25/4	requirements of climate change and sustainable development.

Course Code: UNC012

History of Engineering and Energy
Aswan University, Faculty of Energy Engineering,
Fall Semester, 2013-2014

Instructor Information

Instructor: Dr. Mohamed Shaaban
Office Location: Faculty of Energy Engineering
Telephone: Office – +20 3481234
Office Hours: Sunday 11.00 - 14.00, Wednesday 11.00 – 14.00
E-mail: mshaban68@yahoo.com
Website:

Course Identification

Course Coder: UNC012
Level: 000
Course Name: Engineering and Energy History
Course Location: Faculty of Energy Engineering
Class Times: Sunday 9.00 - 11.00
Prerequisites: NA
Faculty Web Page: http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

History was quite impracticable, not only because of the enormous compression that would be necessary, but because the plan of the original did not lend itself to such treatment. The story of technological development was at every epoch closely related to the historical background. This course aims at being as much a technological history as a history of technology, and in pursuing this course we believe ourselves to be following an important modern trend.

Course Learning Objectives

Know the engineering history in different fields. Know the energy and different sources of it. Know different fields and different programs of engineering Know about the engineer jobs in different pogroms. Understand the engineering job ethics

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Demonstrate knowledge of role of engineering in development and establishment of civilization.

2- Demonstrate knowledge and understanding of engineering history in ancient time, middle ages and modern time.

3- Demonstrate knowledge of different engineering fields.

4- Demonstrate knowledge of different engineering programs.

5- Demonstrate knowledge and understanding of technology transfer, environmental, inventions and engineering ethics.

6- Understand the role of engineering in development and establishment of civilization.

7- Identify technology transfer, environmental & inventions and engineering ethics

8- Assess engineering history in ancient, middle and modern time.

9- Assess resources in engineering history

10- Deal with engineering history at various times

11- Demonstrate knowledge of the engineering ethics and ethical obligations about climate change effects.

12- Understand the historical technologies to face the climatic hazards

Course Resources

1- Chaaban, M. A., "History of Engineering and technology", Elslam Press, 1998

2- Singer, C. Holmyard, E. J. and Hill, A. R., History of Technology, Oxford university press, London, 1975

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following:

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	22/9/2013	Role of engineering in development
2	29/7	Establishment of civilization.
3	6/10	Engineering history in ancient time and middle ages.
4	13/10	Engineering history in modern time.
5	20/10	Engineering fields.
6	27/10	Engineering programs.
7	3/11	Technology transfer,
8	10/11	Midyear exam

9	17/11	Engineering ethics and ethical obligations about climate change effects.
10	24/11	Environmental and inventions
11	1/12	Resources in engineering history
12	8/12	Methods and tools used in engineering history
13	15/12	Technologies related to the climatic hazards
14	22/12	Final Exam

Course Code: UNC321

Project Management

Aswan University, Faculty of Energy Engineering, Departments of Mechanical Power Station and High Voltage Networks,

Spring Semester, 2013-2014

Instructor Information

Instructor: Prof. Dr. Muntasser Dwidar

Location: Faculty of Energy Engineering

Telephone: Office – +20 3481234
Office Hours: Monday 11.00 - 14.00, Thursday 11.00 – 14.00
E-mail: dewidar5@hotmail.com
Website:

Course Identification

Course Coder: UNC321
Level: 300
Course Name: Project management
Course Location: Faculty of Energy Engineering
Class Times: Wednesday 10.00 - 12.00
Prerequisites: NA
Faculty Web Page: http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

The project management is a process. It is an activity of planning, organizing, motivating, and controlling resources. It uses the procedures and protocols to achieve specific goals. A project is designed to produce a product or service. The management requires the development of distinct technical skills and management strategies.

Course Learning Objectives

Know the definitions used in project management. The project life cycle, Project stages, Relationships and responsibilities of the different project parties, Execution phase responsibilities, Productivity, Quality management. - Human Influences of projects: Upgrading, Development, Economic factors, Social factors, Cultural factors, Aesthetic factors, Hygienic and psychological factors. Types of projects: Urban planning projects (residential projects, tourism projects, commercial projects, public buildings…etc.). Infrastructure projects (electricity plants, water supply and sewage networks, road networks, railroad networks, reservoirs, dams…etc.). Different Industrial projects (textile factories, steel Industries, cement factories, carpet factories, ceramic factories, food factories, electrical appliances, car industries…etc.). Environmental impact of projects: Negative and positive impacts (direct and indirect). The assessment of projects-

both nationally and internationally- in order to avoid the negative consequences of projects on the environment. The approved rates and criteria for the compatibility of projects with environmental topics.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:
1- Define the definitions used in project management.
2- Understand the project life cycle
3- Understand the project stages, relationships and responsibilities.
4- Analyze execution phase responsibilities, productivity, and quality management.
5- Discuss the hhuman influences of projects: Upgrading,
6- Identify the types of projects.
7- Analyse the environmental impact of projects
8- Apply the approved rates and criteria for the compatibility of projects with environmental topics.

Course Resources

1- Gray, R. and Larson, K., Project Management: The Managerial Process, McGraw Hill, Irwin, New York, NY, 2002.
2- Harris, R. and McCaffer, D., Modern Construction Management, Black Well Science, London, U.K., 2002.

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following:

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	definitions used in project management
2	23/2	Relationships and responsibilities of the different project parties
3	2/3	The project life cycle and project stages
4	9/3	Execution phase responsibilities
5	16/3	Productivity
6	23/3	Quality management
7	30/3	Human Influences of projects
8	6/4	Midyear exam
9	27/4	Types of projects and urban planning projects
10	4/5	Infrastructure projects and Industrial projects
11	11/5	Environmental impact of projects
12	18/5	The assessment of projects
13	25/5	The approved rates and criteria for the compatibility of projects with environmental topics
14	1/6	Final Exam

Course Code: PCR123

Fundamentals of Thermodynamic

Aswan University, Faculty of Energy Engineering, Departments of Mechanical Power Station and High Voltage Networks,

Spring Semester, 2013-2014

Instructor Information

Instructor: Dr. Waleed Abdel-Fadeel
Location: Faculty of Energy Engineering
Telephone: Office – +20 3481234
Office Hours: Tuesday 11.00 - 14.00, Wednesday 11.00 – 14.00
E-mail: wfadeel@yahoo.com
Website:

Course Identification

Course Coder: PCR123
Level: 100
Course Name: Thermodynamic Fundamentals
Course Location: Faculty of Energy Engineering
Class Times: Thursday 9.00 - 11.00
Prerequisites: NA
Faculty Web Page: http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

The subject of thermodynamics referred to as thermal science. It is of interest to students of all engineering branches, in fact to all mankind, as it deals with the most basic processes occurring in nature. The subject forms the basis for the study of a vast variety of devices such as refrigerators, air conditioners, automotive engines, aircrafts, locomotives, power plants, etc, the use of which is involved in the everyday life of almost every individual. Even the simple kitchen gadget of steam pressure cooker is designed on the basis of the principles of thermodynamics.

Course Learning Objectives

Demonstrate knowledge of basic thermodynamic concepts, ideal gases and pure substance, first low of thermodynamic on different systems. Apply the first law of thermodynamics on various engineering applications. Share ideas and work in a team in an efficient and effective manner under controlled supervision or independently.

Course Content Learning Outcomes

1- Understand the links between sustainability, carbon and climate change.
2- Define the concept of the energy.
2- Define the different basic concepts like properties, state, process, equilibrium, and cycles.
3- Develop students' understanding of the natural carbon cycle.
4- Identify the different between the ideal gases and the pure substance.
5- Understand the property relations relevant to engineering thermodynamics.
6- Understand how to deal with thermodynamic tables.
7- Identify the concept of work and heat.
8- Understand the first law of thermodynamics, internal energy and enthalpy and Steady state steady flow.
9- Apply the first law of thermodynamics.
10- Understand the ssecond law of thermodynamics.
11- Understand the vapour and gas cycles

Course Resources

1- Sonntag, R. E.; Borgnakke, C. and Van Wylen, G. J., Fundamentals of thermodynamics, John Wiley and Sons Inc., 1998.
2- Cengel, Y. A. and M. A., Thermodynamics: An Engineering Approach, WCB/McGraw Hill, 1998

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following:

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	Basic concepts and definitions, the links between sustainability, carbon and climate change.
2	23/2	System and control volume, Property and state
3	2/3	Processes and cycles, natural carbon cycle.
4	9/3	Work definition, Definition of heat transfer
5	16/3	Ideal gases, State equation, Specific heat at constant pressure and volume

6	23/3	Pure substances and phase equilibrium, Tables of thermodynamic properties
7	30/3	First law of thermodynamics, Internal energy and enthalpy
8	6/4	Midyear exam
9	27/4	First law for closed cycle
10	4/5	Closed and open systems: Steady flow and uniform state uniform flow
11	11/5	Application of first law of thermodynamics (reciprocating compressors)
12	18/5	Second law of thermodynamics
13	25/5	Vapour and gas cycles
14	1/6	Final Exam

Course Code: ENN223

Energy Conversion and Utilization

Aswan University, Faculty of Energy Engineering, Departments of Mechanical Power Station and High Voltage Networks,

Spring Semester, 2013-2014

Instructor Information

Instructor: Dr. Ezzat Gad
Location: Faculty of Energy Engineering
Telephone: Office – +20 3481234
Office Hours: Monday 12.00 - 14.00, Wednesday 10.00 – 14.00
E-mail: gadelseed@msn.com
Website:

Course Identification

Course Coder: ENN223
Level: 200
Course Name: Energy conversion and utilization
Course Location: Faculty of Energy Engineering
Class Times: Monday 9.00 - 12.00
Prerequisites: NA
Faculty Web Page: http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

The purpose of this course is to critically examine the technology of energy systems that will be acceptable in a world faced with global warming, local pollution, and declining supplies of oil. The focus is on renewable energy sources (wind, solar, biomass), but other non-

carbon emitting sources (nuclear) and reduced carbon sources (co-generative gas turbine plants, fuel cells) are also studied. Both the devices and the overall systems are analysed.

Course Learning Objectives

Introduction to principles, theories and processes of devices and systems that convert thermal, chemical, nuclear, and electromagnetic energy to electrical, mechanical and alternative chemical form. Energy conversion performance characteristics and sources of inefficiencies are explored for a variety of applications that include conventional fossil energy combustion based systems, nuclear, solar, wind, wave, biomass, thermoelectric, and geothermal energy systems.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:
1- Demonstrate knowledge of energy conversion.
2- Study the future energy systems (e.g. pollution, climate change, energy security).
3- Compare between fuels and cycle analysis.
4- Understand the nuclear reaction physics and reactor designs.
5- Discuss the nuclear waste disposal.
6- Understand the solar-thermal energy.
7- Apply the conversion for heating systems.
8- Identify the photovoltaic technology.
9- Identify the wind energy.
10- Identify the geothermal and ocean current Energy.
11- Identify the biomass and waste to energy.
12- Apply the electro-chemical conversion.
13- Apply the thermoelectric conversion.
14- Know the climate Control, CO2 Sequestration and Energy Sustainability.

Course Resources

1- Energy Systems Engineering, F.M. Vanek, L.D Albright, and Largus Angenent, Second Edition, McGraw-Hill, Inc., 2012.

2- Energy Conversion, Edited by D.Y. Goswami and F.Kreith, CRC Press, 2008. 2. G.N. Tiwari and R.K. Mishra, Advanced Renewable Energy Sources, RSC Publishing, 2012.

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following:

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	Introduction and scope of energy conversion. Motivations for studying future energy systems (e.g. pollution, climate change, energy security).
2	23/2	Overview of fossil fuel combustion and plants. Comparison of fuels (oil, natural gas and coal). Cycle analysis (Brayton, Rankine ,combined cycles, cogeneration).
3	2/3	Nuclear power: nuclear reaction physics, current reactor designs, Breeder reactors, nuclear fusion. Nuclear waste disposal.
4	9/3	Solar-thermal energy: radiation physics, radiation geometry.
5	16/3	Solar energy collection and conversion for heating systems. Concentrating solar thermal power. Stirling cycle
6	23/3	Photovoltaic technology. P-n junctions. Materials. Photovoltaic cells. Solar towers/heliostats.
7	30/3	Wind Energy: formation and availability. Wind turbine design. Turbine capacity factor. Tip speed ratio, Betz limit. Blade

		element theory. Operating conditions (sitting, height, wind speed variation, sitting density). Land requirements. Economics of wind energy.
8	6/4	Midyear exam
9	27/4	Geothermal and Ocean Current Energy : Physics, resources and availabilities, energy conversion technologies.
10	4/5	Biomass and Waste to Energy : Potential of biomass energy. Thermal-chemical and bio-chemical conversion. Syngas and liquid fuel production. System efficiency and environmental impact.
11	11/5	Electro-chemical conversion: physics of conversion, types and systems of fuel cells
12	18/5	Thermoelectric conversion: physics of conversion. Materials and applications
13	25/5	Overview of Climate Control, CO2 Sequestration and Energy Sustainability.
14	1/6	Final Exam

Course Code: ENP222

Heat Transfer

Aswan University, Faculty of Energy Engineering, Departments of High Voltage Networks,

Spring Semester, 2013-2014

Instructor Information

Instructor:	Dr. Mahmuod Hasan
Location:	Faculty of Energy Engineering
Telephone:	Office – +20 3481234
Office Hours:	Thursday 12.00 - 14.00, sunday 10.00 – 14.00
E-mail:	aswan1500@yahoo.com
Website:	

Course Identification

Course Coder:	ENP222
Level:	200
Course Name:	Energy conversion and utilization
Course Location:	Faculty of Energy Engineering
Class Times:	Thursday 9.00 - 12.00
Prerequisites:	NA
Faculty Web Page:	http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

Heat transfer is a subject taught the basic concepts and the simple technical applications of heat transfer. More extensive knowledge of the subject is expected of graduate engineers. The engineer should be familiar with the fundamentals of heat conduction, convective heat transfer and radiative transfer, as well as having a basic knowledge of mass transfer. However, it is important that the student acquires a broad understanding of the fundamentals and methods. Then it is sufficient to deepen this knowledge with selected examples and thereby improve problem solving skills.

Course Learning Objectives

Demonstrate knowledge of heat transfer definitions and terminology, including heat flux, thermal conductivity, and heat transfer coefficients. Demonstrate knowledge of conduction and the equivalent resistance formula, convective and use of the overall heat transfer coefficient, radiant heat transfer, including black bodies, gray bodies and emissivity. Demonstrate knowledge of heat exchangers, including the different types and how they operate, application. Demonstrate knowledge of mass transfer definition and compare it with convenient heat transfer. Apply this knowledge on various engineering application. Share ideas and work in a team in an efficient and effective manner under controlled supervision or independently.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Describe the development of global warming.
2- Explain the difference between turbulent and laminar flow regimes and how to determine which regime exists for a given flow.
3- Use correlations to calculate the convection heat transfer for flows over flat plates, cylinders, and sphere.
4- Determine the heat transfer coefficient and heat transfer rate using correlations for flow in cylindrical pipes.
5- Explain the difference between natural convection and forced convection.
6- Describe the relationship between radiation surface properties and radiation incident on a surface.
7- Determine the heat transfer from a grey surface given emissivity and the surface temperature.
8- Analyse the Heat transfer problems.
9- Deal with different used tables and charts.

Course Resources

1- Bird, R. B.; Steward, W. E. and Lishtbast, E. N., Transport Phenomena, John Wiley and Sons Inc., 1960.
2- Incroperal David, P. Devitt, Introduction to Heat Transfer, John Wiley and Sons, 1990.
3- Holman, J. P., Heat Transfer, McGraw Hill Book Co., 1990.
4- Geankoplis, C. J., Transport Processes and unit operations, Prentice Hall Int., 1993.

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following:

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	Introduction to heat transfer and development of global warming.
2	23/2	Conduction equation and its application for steady state in simple and compound walls
3	2/3	Conduction equation and its application for steady state in simple and compound cylindrical and spherical surfaces
4	9/3	Study of the critical radius of insulation, Extended surfaces (fins) and their efficiency charts.
5	16/3	Transient conduction
6	23/3	Introduction to convection heat transfer

7	30/3	Convection with internal flow and external flow.
8	6/4	Midyear exam
9	27/4	Parameters affecting convection.
10	4/5	Relations for free convection and forced convection
11	11/5	Fundamentals of radiation heat transfer
12	18/5	Heat exchanger
13	25/5	Introduction to mass transfer
14	1/6	Final Exam

Course Code: ENX31x

Renewable Energy Resources *(Elective Course)*

Aswan University, Faculty of Energy Engineering, Departments of High Voltage Networks,

Fall Semester, 2013-2014

Instructor Information

Instructor:	Prof. Dr. Salama Abdel-Hady
Location:	Faculty of Energy Engineering
Telephone:	Office – +20 3481234
Office Hours:	Monday 12.00 - 14.00, Thursday 10.00 – 14.00
E-mail:	salama_abdelhady@hotmail.com

Website:

Course Identification

Course Coder:	ENX31x
Level:	300
Course Name:	Renewable Energy Resources (Engineering Elective Course 1)
Course Location:	Faculty of Energy Engineering
Class Times:	Monday 9.00 - 12.00
Prerequisites:	NA
Faculty Web Page:	http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

The origin and continuation of humankind is based on renewable energy such as solar and wind. The most basic processes supporting life on earth, such as photosynthesis and the rain cycle, are driven by solar and wind energy. From the very beginning of its history humankind realized that a good use of solar and wind energy is in humankind's benefit. Despite this, only recently, during the last 40 years, has solar and wind energy been har-nessed with specialized equipment and used as an alternative source of energy,

Course Learning Objectives

Identity different renewable energy, resources for power production such as wind, Solar, and non-conventional by hydro-power. Recognize natural sources of wind and solar ؟ energies in Egypt. Practice the operation and Design of Horizontal and Vertical Axis wind Turbines. Practice the Operation and Design of Solar flat plate collectors, concentrator systems, photovoltaic systems and other solar applications. Practice the operation of non-conventional hydro Power Systems Such as wave Energy and Tidal Energy. Recognize other renewable energy technologies such as Biomass, Ocean Thermal Energy …etc.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Identify the future energy systems and energy Sustainability.

2- Define the renewable energy
3- Study the causes and the power of wind energy
4- Study of measuring equipment for wind speed and direction.
5- Analysis of wind energy data: Energy and frequency curves.
6- Analysis wind turbine theory and aerofoil theory.
7- Study of forces acting on the wind turbine and study the turbine performance.
6- Study of solar thermal energy: Its intensity in outer space and the calculation of the solar intensity on earth.
9- Study of solar angles, Shades and the equation of time.
10- Study of the solar collector and its components.

Course Resources

1- Duffie and Beckman, Solar Engineering of Thermal Processes, John Wiley, 1980.

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following:

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	22/9/2013	Renewable energy, future energy systems and energy sustainability.
2	29/7	Causes and the power of wind energy

3	6/10	Measuring equipment for wind speed and direction
4	13/10	Wind energy and frequency curves
5	20/10	Aerofoil theory.
6	27/10	Wind turbine theory
7	3/11	Forces acting on the wind turbine and study the turbine performance
8	10/11	Midyear exam
9	17/11	Introduction to solar thermal energy
10	24/11	Intensity in outer space and the calculation of the solar intensity on earth
11	1/12	Solar angles, Shades and the equation of time.
12	8/12	Components of solar collector
13	15/12	Design of solar collector
14	22/12	Final Exam

Course Code: SEP32x

Pollution *(Elective Course)*

Aswan University, Faculty of Energy Engineering, Departments of Mechanical Power Station, Spring Semester, 2012-2013

Instructor Information

Instructor:	Dr. Mohamed Fathi
Location:	Faculty of Energy Engineering
Telephone:	Office – +20 3481234
Office Hours:	Tuesday 12.00 - 14.00, Wednesday 10.00 – 14.00
E-mail:	mfsadik@yahoo.com
Website:	

Course Identification

Course Coder:	SEP32x
Level:	300

Course Name:	Pollution (Special Elective Course 2)
Course Location:	Faculty of Energy Engineering
Class Times:	Tuesday 9.00 - 12.00
Prerequisites:	NA
Faculty Web Page:	http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

This course covers the practices and technologies that are applied to the prevention of air pollution, and to the cleaning and control of industrial air emissions. It provides a bridge for today's environmental manager by focusing on an integrated approach to managing air pollution problems within industrial operations.

Course Learning Objectives

Know the: definition of pollution - Sources of pollution - Types of pollution and their effect on lumen health. Methods of measurement - methods of pollutant reduction.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:
1- Define the environment and climate change.
2- Define the pollution.
3- Identify the sources of pollution.
4- Identify the types of pollution.
5- Discuss their effect on lumen health.
6- Identify the methods of measurement.
7- Apply the methods of pollutant reduction.

Course Resources

1- Nicholas P. Cheremisinoff, HANDBOOK OF AIR POLLUTION PREVENTION AND CONTROL, Elsevier Science (USA), 2002.

2- Boubel et al. (1994) Fundamentals of Air Pollution, 3rd Edition. Academic Press.

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

http://lwf.ncdc.noaa.gov/oa/climate/gases.html#cd
http://lwf.ncdc.noaa.gov/oa/climate/gases.html#m
http://lwf.ncdc.noaa.gov/oa/climate/gases.html#n2o
http://www.gsf.de/eurotrac
http://www.epa.gov/air/airtrends/reports.html
http://www.epa.gov/air/airtrends/aqtrnd03/
http://www.epa.gov/oar/caa/contents.html
http://www.epa.gov/air/basic.html
http://yosemite.epa.gov/R10/AIRPAGE.NSF
http://en.wikipedia.org/wiki/Air_pollution

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following:

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	Environment and climate change
2	23/2	Primary and secondary pollution
3	2/3	Sources of pollution
4	9/3	Types of pollution.

5	16/3	Air pollution regulation
6	23/3	Toxic pollutants
7	30/3	Radioactive pollutants
8	6/4	Midyear exam
9	27/4	Indoor pollutants
10	4/5	Ventilation and air quality control
11	11/5	Methods of measurement
12	18/5	Effect on lumen health
13	25/5	Pollutant reduction.
14	1/6	Final Exam

Course Number:AQA121

University of Aswan, Faculty of Science, Department of Mathematics,
Summer Semester, 2013-2014

Instructor Information

Instructor: Dr. Adel A. El-Faheem
Office Location: Aswan University Campus
Telephone: Office – +20 3481533
Office Hours: Sunday 10.00 – 13.00
E-mail: elfaheem@aswu.edu.eg
Website:

Course Identification

Course Number: AQA121
Course Name: Statistical Biology and Experimental Design
Course Location: University Campus
Class Times: Sunday 10.00 – 13.00
Prerequisites: Introduction to Probability and Statistics
Faculty Web Page:

Course Description/Overview

This course is an introduction to statistics, experimental design and statistical analysis for addressing problems in biology. Statistics includes those techniques and tools used for the collection, display, and analysis of data for the purpose of making decisions or constructing mathematical models. Thus, we will explore the theoretical properties of statistical inference methods, and we will apply these methods to many sets of real data from the surrounding environment and climate change and its impact on fisheries statistics. The course begins with methods for collecting and summarizing data and analyzing and studying the measures of central tendency and measures of dispersion. The course then introduces probability theory as a background for understanding inferential statistics and Design of Experiments. Methods are next presented for drawing

inferences from research samples to populations from which the samples were drawn. The course covers basic statistical tests: analysis of variance, and Latin square - block design - the design of the cluster - the analysis of covariance.

Course Learning Objectives

The main goals of this course are practical:
1) to help you learn and practice basic experimental design, statistical methods, and tools for analyzing data,
2) to help you better critically interpret the primary biological literature. We work as much as possible with real biological problems and data sets related with environment and climate change,
3) to apply statistical methods learned to help solve interesting and realistic problems across a variety of fields.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. To learn basic techniques for collecting and summarizing data and analyzing and studying the measures of central tendency and measures of dispersion.
2. To appreciate the importance of how data are produced.
3. To understand the mathematical theory behind common methods of statistical inference, such as analysis of variance and the analysis of covariance .
4. To apply statistical methods learned to help solve interesting and realistic problems across a variety of fields.
5. To gain facility in analysis of variance, and Latin square - block design - the design of the cluster - the analysis of covariance.

Course Resources

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

1- Snedecor, G. W. and W. G. Cochran (1969). Statistical Methods 6th ed. Iowa State Univ., Press, Ames.

2- Steel, R. G. D. and J. H. Torrie (1980). Principles and procedures of Statistical: A biometrical Approach 2nd Ed. New Yourk U.S.A.

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments/attendance/participation	15 degrees
Midyear Exam	15 degrees
Applied Part	10 degrees
An oral exam	10 degrees
Final Exam	50 degrees
Total Points	100

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than 25% of classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 15% of the grade.

Dissability

N.A.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/3/2014	**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	23/3	Methods for collecting and summarizing data
3	30/3	Analyzing and studying the measures of central tendency.
4	13/4	Measures of dispersion.
5	27/4	Introduces probability theory as a background for

		understanding inferential statistics
6	4/5	Understanding inferential statistics and testing the significant.
7	11/5	Introduction to Design of Experiments
8	18/5	Analysis of variance.
9	25/5	Latin square - block design - the design of the cluster -
10	1/6	Design sectors
11	8/6	Design Cluster
12	15/6	the analysis of covariance

APENDIX I:

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number: 332 Bot.

Ecology and Physiology of Algae

Aswan University, Faculty of Science

Instructor Information

Instructor: Dr. Ahmed M. El-Otify
Office Location: Aswan University Campus
Telephone: (+20) 97 233 15 61
Office Hours:
E-mail: elotify57@yahoo.co.uk
Website:

Course Identification

Course Number: **332 Bot.**
Course Name: **Ecology and Physiology of Algae**

Course Location: Aswan University campus
Class Times: Monday, 9 - 12 am
Prerequisites: General Botany - Phycology
Faculty Web Page:

Course Description/Overview

This course focuses on the studying of the relationships between algae in different habitats and their environment. Algae occupied different niche habitats in aquatic ecosystems. They live as phytoplankton or may be associated to various natural or artificial substrates and live as attached forms (phycoperiphyton). On the other hand, terrestrial algae may occupy different non-aquatic habitats and can live as soil algae, lichenized or rhizospheric forms. Generally, algae in different habitats are influenced by various abiotic and biotic factors prevailed in their environments. Alterations that may take place in the environmental conditions can influence the development and distribution of algae in their environments. Algae in aquatic ecosystems are regarded as the base of food web and have a pivotal role in influencing other aquatic biota in such habitats.

Course Learning Objectives

The main objective of the ecology of algae is to understand the concept of environmental conditions as well as the alterations that may take place in these conditions and the extent to which these conditions can influence the various communities of algae. For instance, studying of the ecology of phytoplankton and attached algae in aquatic habitats and of soil algae in terrestrial habitats.

Course Content Learning Outcomes

Upon successful completion of this course, students should be able to: demonstrate and understand the concept of the ecology of algae. In addition, students would be able to determine the role of algae in the ecosystem. Furthermore, the

students would be able to use the knowledge of algae and their habitats for environmental impact assessment. Besides, the students would be able to identify the algae of economic value and others that may be harmful.

Course Resources:

4. Reynolds, C. S. (1984). The ecology of freshwater phytoplankton. Cambridge University Press, London: 384pp.
5. Round, F. E. (1982). The ecology of algae. Cambridge University Press, London: 653pp.
6. Sournia, A. (1978). Phytoplankton manual. Paris: UNESCO: 337pp.
2. Wetzel, R. G. and Likens, G. E. (2001). Limnological Analyses (3rd edn). Springer, USA

Course Website(s)

Required Course Texts and Materials

Assignments and Grading Scheme

Grading Policy

Grades can be based on the following: (Example)

Activities participation and class attendance	10%
Final Lab. Exam.	30%
Final Written Exam.	60%
Total Points	**100%**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)

1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Introduction to the ecology of algae.
3		Distribution of algae.
4		General outlook on phytoplankton
5		Sampling, preservation, qualitative and quantitative determinat of phytoplankton.
6		Factors influencing the distribution of phytoplankton.
7		Factors influencing the distribution of phytoplankton.
8		Limiting factors for phytoplankton development and distribution.
9		Man- made effects on phytoplankton.
10		Eutrophication, water blooms and harmful algae.
11		Eutrophication, water blooms and harmful algae.
12		General outlook of the attached algae.
13		Studying of attached algae and the factors influencing their development.
14		General outlook of soil algae.
15		Sampling and studying the factors influencing the growth and distribution of soil algae.

Instructor Information

Instructor: Associate Prof. Dr. Ashraf Emam
Office Location: Aswan University Campus
Office: 319, 3rd floor, Labs Building of Faculty of Science
Telephone: Office +20 973481533
Office Hours: Sunday 12.30-4.00 pm, Wednsday 12.30 – 4.00 pm.
Email: emam99@aswu.edu.eg
ashrafemam99@hotmail.com
Website: http://sci.aswu.edu.eg/Staff/emam99/Pages/default.aspx
http://scholar.google.com/citations?user=pod-43UAAAAJ

Course Identification

Course Number: **GEO 410**
Course Name: Economic Geology
Course Location: University Campus
Class Times: 2:00 – 3:00 pm, Sunday
Faculty Web Page: http://sci.aswu.edu.eg

Course Description:

Resources formed by geological processes are commonly called mineral resources and the branch of geology which concerned with the study of these resources is called Economic geology. This course provides an introduction to the geologic and economic factors that result in the development of commercial concentrations of mineral resources. Emphasis will be placed on the descriptive geology and origin of economic mineral concentrations within the context of their overall geologic settings. The geologic and economic nature of metallic and industrial mineral commodities in both "hard rock" and "soft rock" geologic environments will be discussed. Related topics to be discussed include importance of mineral resources to the global economy, mineral exploration and evaluation, mineral extraction and processing, and environmental impacts result from mining and mineral extraction.

Course Learning Objectives:
The course looks at the origin and occurrence of economic natural resources including metallic ore deposits and industrial minerals. The course aims to provide students with a knowledge and understanding of the origin and distribution of mineral resources, the geologic factors that have led to ore deposit formation, and the geologic conditions that control the environmentally responsible development. Also, students should comprehend the wide variety of ore-forming processes, and have developed skills in interpreting ore deposits and exploration techniques.

Course Content Learning Outcomes
Upon successful completion of this course, students will be able to:

7. Demonstrate knowledge of the variety of ore-forming processes and discuss the key geological processes responsible for ore deposit formation.
8. Identify common rock types and minerals found in and around ore deposits.
9. Describe the essential geological setting of the main ore deposit types that provide the majority of the metals required by human society.
10. Understand the genesis of mineral deposits and their relationship to plate tectonics in time and space.
11. Describe the ore deposit classification and distribution in Egyptian deserts.
12. Be conversant with the environmental impacts of mining processes.

Required Course Texts and Materials:
Reference textbook for this course are:

3) An introduction to ore geology, Evans (1987)
4) Ore deposit geology and its influence on mineral exploration, Edwards and Atkinson (1986)

In addition, selected publications in the fields relevant to the topics will be reviews and discussed extensively.

Assignments and Grading Scheme

Grading System
0 to 150 (where 90 is the least pass mark)

Grading Policy

Assignments	20%
Exams	70%
Class attendance/participation	10%
Total Points	**100**

Course Schedule

Week	Date	Topics
1		Discussion of syllabus, assignments, and course requirements.
2		Natural concentration of ores
3		Migration of ore forming fluids
4		Deposition of ores
5		Classification of ore deposits
6		Geothermometry
7		Magmatic ore deposits
8		Metamorphic ore deposits
9		Supergene enrichment
10		Sedimentry ore deposits

11		Mineral deposits in Egypt
12		Natural concentration of ores
13		Migration of ore forming fluids
14		Hazards associated with ore resources exploitation.

Instructor Information

Instructor: Associate Prof. Dr. Ashraf Emam
Office Location: Aswan University Campus
Office: 319, 3rd floor, Labs Building of Faculty of Science
Telephone: Office +20 973481533
Office Hours: Sunday 12.30-4.00 pm, Wednsday 12.30 – 4.00 pm.
Email: emam99@aswu.edu.eg
ashrafemam99@hotmail.com
Website: http://sci.aswu.edu.eg/Staff/emam99/Pages/default.aspx
http://scholar.google.com/citations?user=pod-43UAAAAJ

Course Identification

Course Number: **GEO 434**
Course Name: Environmental Geology
Course Location: University Campus
Class Times: 2:00 – 3:00 pm, Wednesday

Faculty Web Page: http://sci.aswu.edu.eg

Course Description:
Environmental geology is a science which objectively studies geologic information and applies it to contemporary environmental problems such as pollution, waste management, resource extraction, natural hazards, and human health. An environmental geologist might evaluate the risk and damage potential from natural hazards such as floods, landslides, volcanoes, or earthquakes. The environmental changes on local to global scales can be placed into an earth systems science perspective through examining the evolution and structure of our planet's components, and how these components naturally interact. This course is designed to introduce students to the relationship between humans and our Earth. It focuses on environmental and geosciences subjects that facilitate greater awareness of the interactions between the different Earth's components. The course discusses the geologic processes that shape the surface of the Earth, and how these processes affect and are affected by human activity. Moreover, the relationships between the lithosphere, hydrosphere, and atmosphere will be discussed. Particular attentions are given to the subjects of soil, mineralogy, biogeochemical cycles, climate change, and pollution by human activities. The scientific methods that allow studying, prediction, and mitigation of environmental problems will be discussed.

Course Learning Objectives:
The course introduces students to our natural environment and the human interactions and everyday problems with our environment and global community from a geological perspective. Topics to be covered will include; earth materials and structure, environmental hazards such as floods, volcanoes and earthquakes, pollution of the environment, waste disposal, natural resources, and energy sources and their exploitation. The overarching goals of this course are to:

- Provide the fundamental concepts of environmental geology, and the interactions between the Earth systems and human activities.
- Increase awareness of environmental issues and how they affect society.
- Raise awareness of the natural hazards associated with common geologic processes including volcanoes, earthquakes, tsunamis, and floods.
- Gain an understanding of the physical processes that operate in and on earth.

- Understand the interactions between humans and these geological processes.
- Introduce the environmental challenges such as climate change, the global water quality and supply, and the scale of these challenges
- Summarize the pollutants and harms that are created from exploitation of ores, minerals and energy resources.
- Process and interpret the environmental data to solve environmental problems.

Course Content Learning Outcomes
Upon successful completion of this course, students will be able to:

35. Discuss the fundamental concepts of environmental geology, the earth system and the different environmental cycles, and the interactions between the Earth systems and human activities.
36. Understand the geologic processes and associated natural hazards, the pollutants and harms, created from ore and energy resources exploitation.
37. Understand the interactions between humans and the geological processes.
38. Summarize the environmental challenges such as climate change, the global water quality and supply.
39. Process and interpret the environmental data and apply scientific methods to solve environmental problems.

Required Course Texts and Materials:
Reference textbook for this course are:
1) Principles of Environmental Geochemistry by G. Nelson Eby, Brooks/Cole, 2004; 2) Environmental Geology, 8th edition, by Edward A. Keller Prentice Hall, 2000.
3) The Geology of Egypt, by Said, R., Ed. (1990).
In addition, selected publications in the fields relevant to the topics will be reviews and discussed extensively.

Assignments and Grading Scheme

Grading System
0 to 150 (where 90 is the least pass mark)

Grading Policy

Assignments	20%
Exams	70%
Class attendance/participation	10%
Total Points	**100**

Course Schedule

Week	Date	Topics
1		Discussion of syllabus, assignments, and course requirements.
2		Environmental geology: Fundamental concepts and definitions.
3		Earth structure and systems.
4		Geologic cycle and processes
5		Soil formation, classification and profile
6		Mass wasting processes
7		Volcanism: tectonic setting and types
8		Volcanic hazards, volcanoes and climate
9		Earthquake process, magnitude and intensity

10		Hazards and effects of earthquakes
11		Hazards associated with Floods and torrents
12		Hazards associated with ore and energy resources exploitation.
13		Wastes management
14		The environmental challenges (climate change, the global water quality and supply).

Course	Environmental Geology
Module 1	**Introduction**
Key Concepts	Environmental geology: Fundamental concepts and definitions
Overview	Environmental geology is the use of geologic information to help us solve conflicts in land use, to minimize environmental degradation, and to maximize the beneficial results of using our natural and modified environments. This module discusses the basic concepts and principles of environmental geology, and defines the commonly used terms and issues. The module provides general introduction to Environmental Geology, environmental ethics, environmental Crisis and fundamental concepts of the environmental sciences
Aim	The overriding aim of this module is to turn students able to discourse on basic concepts and principles of environmental geology, definitions of commonly used terms and issues, and fundamental concepts that apply to all environmental sciences.
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss the different terms, concepts and principles of environmental geology. • Summarize the environmental ethics and crisis
Units	Unit 1.1: Introduction to Environmental Geology. Unit 1.2: Environmental Ethics. Unit 1.2: Environmental Crisis. Unit 1.4: Fundamental Concepts of the Environmental Sciences.

Readings	Environmental Geology, Lundgren, L. W., 1999 Environmental Geology, 8th edition, Keller E. A., 2000
Activity	What environmental geology means? Discuss the basic concepts of environmental geology? Write brief notes on environmental ethics and crisis?
Module 2	**Geologic cycles and processes**
Key Concepts	Plate tectonics, rock cycle, water cycle, surficial process
Overview	This module focuses on the geologic cycle including tectonic, hydrologic, rock, and biogeochemical sub-cycles that influence each other and may produce natural hazards and processes important to environmental geology such as landslides, earthquakes, volcanic activity, flooding, groundwater flow, and weather. Next, the module spotlights on the three rock families and their properties, such as a compressive strength and response to stress and strain that are essential to evaluating natural hazards.
Aim	The overriding aim of this module is to enhance student understandings about the geologic cycle, rock properties and surfacial process.
Learning Outcomes	At the end of this module students will be able to: • Identify and discuss the geologic sub-cycles • Understand the surficial processes that produce natural hazards.
Units	Unit 2.1: Geologic Cycle Unit 2.2: Hydrologic Cycle Unit 2.3: Biogeochemical Cycle Unit 2.4: Physical Properties of Rocks Unit 2.5: Surficial Processes
Readings	Environmental Geology, Lundgren, L. W., 1999 Environmental Geology, 8th edition, Keller E. A., 2000

Activity	Where do volcanoes and earthquakes occur? What is the percent of fresh water on earth? How much carbon dioxide enters the Earth's atmosphere each day? What is carbon dioxide's residence time in the atmosphere? Define the three types of stress? What are the physical earth processes might cause each, and what strain would result? What are the differences between elastic and plastic deformations?
Module 3	**Soils**
Key Concepts	Soil formation, soil profile, soil physical properties
Overview	The module focuses on soils--how they are formed and classified, their texture and structure, how liquids move through them, and their engineering properties. The module concludes the effects of land use activities on soil which results in erosion, pollution, and desertification.
Aim	The overriding aim of this module is to turn students able to understand the principle factor controlling soil formation, and to evaluate the physical properties of soils as engineering materials.
Learning Outcomes	At the end of this module students will be able to: • Reveal knowledge on the soil formation factors • Identify the different soil horizons and soil profile • Determinate the physical and engineering properties of soils
Units	Unit 3.1: Soil formation and classification Unit 3.2: Soil horizons and soil profile Unit 3.3: Physical properties of soils
Readings	Environmental Geology, 8th edition, Keller E. A., 2000
Activity	What are the main factors controlling soil formation? What are the criteria that used to make soil classification? Define the most common soil horizons and their characteristics? What are the physical parameters you use to evaluate soils for

	engineering purposes?
Module 4	**Slope Failure and Mass Wasting Processes**
Key Concepts	Slope Profiles, Slope Stability, Types of Mass Wasting, The Human Impact of Landslides, Subsidence
Overview	Slope failure, also referred to as mass wasting, is the down-slope movement of rock debris and soil in response to gravitational stresses. This module focuses on the types of mass wasting classified based on the type of down-slope movement. The types of movement, falls, slides, and flows are covered in this module. In addition, another type of ground failure and subsidence are covered.
Aim	The overriding aim of this module is to turn students able to discourse on major types of mass wasting and their causes.
Learning Outcomes	At the end of this module learners will be able to: • Identify the slope stability and types of down-slope movement. • Understand the different mass wasting processes. • Summarize the driving and resisting forces. • Discuss the effects of water and earth materials on slope failure.
Units	Unit 4.1: Slopes and slope profiles Unit 4.2: Mass wasting processes Unit 4.3: Types of down-slope movement Unit 4.4: Slope stability, driving and resisting forces Unit 4.5: Water and ground material effects on pattern of slope failure
Readings	Environmental Geology, 8th edition, Keller E. A., 2000
Activity	List the common mass wasting processes and types of slope failure? Write brief notes on slope stability, driving and resisting forces? Summarize effects of water and earth materials on slope failure pattern? What are the conditions causing the slope failure?

Module 5	Volcanism and Earthquakes
Key Concepts	Major Types of Volcanoes, Volcanic Hazards, Effects of Volcanoes, Earthquake Process, Magnitude and Intensity Earthquakes, Effects of Earthquakes.
Overview	Volcanoes differ greatly in style of eruption and associated hazards. Moreover, earthquakes are probably the most frightening naturally occurring hazard encountered. This module discusses the types of volcanoes and earthquake process, effects of volcanoes and earthquakes, and their associated hazards. It includes the following major topics: tectonic setting and types of volcanoes, volcanic hazards, predicting volcanic activity, volcanoes and climate, types of faults and earthquake process, detecting, locating and measuring earthquakes.
Aim	The overriding aim of this module is to turn students able to discourse on major types of volcanoes and earthquake process, their primary and secondary effects, and the associated hazards.
Learning Outcomes	At the end of this module learners will be able to: • Understand tectonic setting of volcanoes. • Identify the common types of volcanoes. • Summarize the effects and hazards of volcanoes. • Understand the earthquake process, their magnitude and intensity • Summarize the effects and hazards of earthquakes
Units	Unit 5.1: Volcanoes: tectonic setting and types. Unit 5.2: Volcanic hazards and predicting volcanic activity. Unit 5.3: Volcanoes and climate. Unit 5.4: Types of faults and earthquake process. Unit 5.5: Magnitude, intensity and effects of earthquakes
Readings	Environmental Geology, 8th edition, Keller E. A., 2000

Activity	What are the common types of volcanoes? List and briefly describe the primary and secondary environmental effects of volcanic eruptions? Discuss the relationship between the volcanic activity and climate? List and briefly describe the primary and secondary environmental effects of earthquakes?

CLIMASP COURSE SYLLABUS

Course Syllabus

Course Code: UNC012

History of Engineering and Energy

Aswan University, Faculty of Energy Engineering,

Fall Semester, 2013-2014

Instructor Information

Instructor: Dr. Mohamed Shaaban

Office Location: Faculty of Energy Engineering

Telephone: Office – +20 3481234

Office Hours: Sunday 11.00 - 14.00, Wednesday 11.00 – 14.00
E-mail: mshaban68@yahoo.com
Website:

Course Identification

Course Coder: UNC012
Level: 000
Course Name: Engineering and Energy History
Course Location: Faculty of Energy Engineering
Class Times: Sunday 9.00 - 11.00
Prerequisites: NA
Faculty Web Page: http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

History was quite impracticable, not only because of the enormous compression that would be necessary, but because the plan of the original did not lend itself to such treatment. The story of technological development was at every epoch closely related to the historical background. This course aims at being as much a technological history as a history of technology, and in pursuing this course we believe ourselves to be following
an important modern trend.

Course Learning Objectives

Know the engineering history in different fields. Know the energy and different sources of it. Know different fields and different programs of engineering Know about the engineer jobs in different pogroms. Understand the engineering job ethics

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Demonstrate knowledge of role of engineering in development and establishment of civilization.
2- Demonstrate knowledge and understanding of engineering history in ancient time, middle ages and modern time.
3- Demonstrate knowledge of different engineering fields.
4- Demonstrate knowledge of different engineering programs.
5- Demonstrate knowledge and understanding of technology transfer, environmental, inventions and engineering ethics.
6- Understand the role of engineering in development and establishment of civilization.
7- Identify technology transfer, environmental & inventions and engineering ethics
8- Assess engineering history in ancient, middle and modern time.
9- Assess resources in engineering history
10- Deal with engineering history at various times
11- Analyze methods and tools used in engineering history and engineering ethics

Course Resources

1- Chaaban, M. A., "History of Engineering and technology", Elslam Press, 1998
2- Singer, C. Holmyard, E. J. and Hill, A. R., History of Technology, Oxford university press, London, 1975

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	22/9/2013	Role of engineering in development
2	29/7	Establishment of civilization.
3	6/10	Engineering history in ancient time and middle ages.
4	13/10	Engineering history in modern time.
5	20/10	Engineering fields.
6	27/10	Engineering programs.
7	3/11	Technology transfer,
8	10/11	Midyear exam
9	17/11	Inventions
10	24/11	Environmental,
11	1/12	Engineering ethics
12	8/12	Resources in engineering history
13	15/12	Methods and tools used in engineering history
14	22/12	Final Exam

Module 1	**Engineering Development and Civilization**
Key Concepts	Civilization, history
Overview	History was quite impracticable, not only because of the enormous compression that would be necessary, but because the plan of the original

	did not lend itself to such treatment. The story of technological development was at every epoch closely related to the historical background.
Aim	The overriding aim of this module is to equip students with the engineering history at different ages.
Learning Outcomes	At the end of this module learners will be able to: 1- Demonstrate knowledge of role of engineering in development and establishment of civilization. 2- Demonstrate knowledge and understanding of engineering history in ancient time, middle ages and modern time.
Units	• Unit 1.1: Role of engineering in development • Unit 1.2: Establishment of civilization • Unit 1.3: Engineering history in ancient time and middle ages • Unit 1.4: Engineering history in modern time.
Readings	1- Chaaban, M. A., "History of Engineering and technology", Elslam Press, 1998
Activity	**Overview**
	Assignment : Using the WWW search for different civilization and its famous pictures. Assignment : Prepare a research proposal
Module 2	**Engineering Programs**
Key Concepts	Engineering Fields, Engineering programs
Overview	Because of the development of engineering, there are many fields are presented. Different engineering programs are described which leads to different jobs.
Aim	The overriding aim of this module is to equip students with the

	engineering fields, programs and jobs
Learning Outcomes	At the end of this module learners will be able to: 1- Know different fields and different programs of engineering 2- Know about the engineer jobs in different pogroms.
Units	• Unit 2.1: Engineering programs • Unit 2.2: Engineering fields • Unit 2.3: Engineering jobs
Readings	2- Singer, C. Holmyard, E. J. and Hill, A. R., History of Technology, Oxford university press, London, 1975
Activity	**Overview** Assignment : Using the WWW search for different programs, fields and jobs Assignment : Prepare a research proposal
Module 3	**Technology transfer**
Key Concepts	Technology, inventions
Overview	The aims at being as much a technological history as a history of technology transfer, and in pursuing this course we believe ourselves to be following an important modern trend.
Aim	The overriding aim of this module is to equip students with the how is the technology transferred during centuries and the greatest inventions.
Learning Outcomes	At the end of this module learners will be able to: 1- Identify technology transfer, 2- Know about the inventions.
Units	• Unit 3.1: Technology transfer, • Unit 3.2: Engineering fields • Unit 3.3: Inventions

Readings	2- Singer, C. Holmyard, E. J. and Hill, A. R., History of Technology, Oxford university press, London, 1975
Activity	**Overview**
	Assignment : Using the WWW search **Assignment : Prepare a research proposal**
Module 4	**Technology transfer**
Key Concepts	Technology, inventions
Overview	The aims at being as much a technological history as a history of technology transfer, and in pursuing this course we believe ourselves to be following an important modern trend.
Aim	The overriding aim of this module is to equip students with the how is the technology transferred during centuries and the greatest inventions.
Learning Outcomes	At the end of this module learners will be able to: 1- Identify technology transfer, 2- Know about the inventions.
Units	• Unit 4.1: Technology transfer, • Unit 4.2: Engineering fields • Unit 4.3: Inventions
Readings	2- Singer, C. Holmyard, E. J. and Hill, A. R., History of Technology, Oxford university press, London, 1975
Activity	**Overview**
	Assignment : Using the WWW search **Assignment : Prepare a research proposal**
Module 5	**Engineering ethics**
Key Concepts	Environment, ethics
Overview	There is a strong relation between technology and the environment and

	ethics.
Aim	The overriding aim of this module is to equip students with the relation between invention and ethics.
Learning Outcomes	At the end of this module learners will be able to: 1- Identify technology transfer, environmental & inventions and engineering ethics 2- Demonstrate knowledge and understanding of technology transfer, environmental, inventions and engineering ethics.
Units	• Unit 5.1: Environmental, • Unit 5.2: Engineering ethics • Unit 5.3: Methods and tools used in engineering history
Readings	2- Singer, C. Holmyard, E. J. and Hill, A. R., History of Technology, Oxford university press, London, 1975
Activity	**Overview** Assignment : Using the WWW search **Assignment : Prepare a research proposal**

CLIMASP COURSE SYLLABUS

Course Syllabus

Course Code: UNC321

Project Management

Aswan University, Faculty of Energy Engineering, Departments of Mechanical Power Station and High Voltage Networks,

Spring Semester, 2013-2014

Instructor Information

Instructor:	Prof. Dr. Muntasser Dwidar
Location:	Faculty of Energy Engineering
Telephone:	Office – +20 3481234
Office Hours:	Monday 11.00 - 14.00, Thursday 11.00 – 14.00
E-mail:	dewidar5@hotmail.com
Website:	

Course Identification

Course Coder:	UNC321
Level:	300
Course Name:	Project management
Course Location:	Faculty of Energy Engineering
Class Times:	Wednesday 10.00 - 12.00
Prerequisites:	NA
Faculty Web Page:	http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

The project management is a process. It is an activity of planning, organizing, motivating, and controlling resources. It uses the procedures and protocols to achieve specific goals. A project is designed to produce a product or service. The management requires the development of distinct technical skills and management strategies.

Course Learning Objectives

Know the definitions used in project management. The project life cycle, Project stages, Relationships and responsibilities of the different project parties, Execution phase responsibilities, Productivity, Quality management. - Human Influences of projects: Upgrading, Development, Economic factors, Social factors, Cultural factors, Aesthetic factors, Hygienic and psychological factors. Types of projects: Urban planning projects (residential projects, tourism projects, commercial projects, public buildings…etc.). Infrastructure projects (electricity plants, water supply and sewage networks, road networks, railroad networks, reservoirs, dams…etc.). Different Industrial projects (textile factories, steel Industries, cement factories, carpet factories, ceramic factories, food factories, electrical appliances, car industries…etc.). Environmental impact of projects: Negative and positive impacts (direct and indirect). The assessment of projects- both nationally and internationally- in order to avoid the negative consequences of projects on the environment. The approved rates and criteria for the compatibility of projects with environmental topics.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Define the definitions used in project management.

2- Understand the project life cycle

3- Understand the project stages, relationships and responsibilities.

4- Analyze execution phase responsibilities, productivity, quality management.

5- Discuss the hhuman influences of projects: Upgrading,

6- Identify the types of projects.

7- Analyse the environmental impact of projects

8- Apply the approved rates and criteria for the compatibility of projects with environmental topics.

Course Resources

1- Gray, R. and Larson, K., Project Management: The Managerial Process, McGraw Hill, Irwin, New York, NY, 2002.

2- Harris, R. and McCaffer, D., Modern Construction Management, Black Well Science, London, U.K., 2002.

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)

1	16/2/2014	definitions used in project management
2	23/2	Relationships and responsibilities of the different project parties
3	2/3	The project life cycle and project stages
4	9/3	Execution phase responsibilities
5	16/3	Productivity
6	23/3	Quality management
7	30/3	Human Influences of projects
8	6/4	Midyear exam
9	27/4	Types of projects and urban planning projects
10	4/5	Infrastructure projects and Industrial projects
11	11/5	Environmental impact of projects
12	18/5	The assessment of projects
13	25/5	The approved rates and criteria for the compatibility of projects with environmental topics
14	1/6	Final Exam

Module 1	**Definitions**
Key Concepts	Project, Management
Overview	The project management is a process. It is an activity of planning, organizing, motivating, and controlling resources.
Aim	The overriding aim of this module is to equip students know the definitions used in project management
Learning Outcomes	1- Define the definitions used in project management. 2- Understand the project life cycle
Units	• Unit 1.1: definitions used in project management • Unit 1.2: Relationships and responsibilities of the different project parties • Unit 1.3: The project life cycle and project stages

Readings	1- Gray, R. and Larson, K., Project Management: The Managerial Process, McGraw Hill, Irwin, New York, NY, 2002.
Activity	**Overview** Assignment : Using the WWW search for different definitions Assignment : Prepare a research proposal
Module 2	**Productivity and Quality**
Key Concepts	Productivity, Quality
Overview	A project is designed to produce a product or service with quality management
Aim	The overriding aim of this module is to equip students with the project stages.
Learning Outcomes	At the end of this module learners will be able to: 1- Understand the project stages, relationships and responsibilities. 2- Analyze execution phase responsibilities, productivity, quality management.
Units	• Unit 2.1: Execution phase responsibilities • Unit 2.2: Productivity • Unit 2.3: Quality management
Readings	Harris, R. and McCaffer, D., Modern Construction Management, Black Well Science, London, U.K., 2002.
Activity	**Overview** Assignment : Using the WWW search Assignment : Prepare a research proposal

Module 3	**Human Influences of Projects**
Key Concepts	Human, Projects
Overview	Human influences of projects such as upgrading, development, economic factors, social factors, cultural factors, aesthetic factors, Hygienic and psychological factors are the aim.
Aim	The overriding aim of this module is to equip students with human influences of projects
Learning Outcomes	At the end of this module learners will be able to: 1- Discuss the hhuman influences of projects: Upgrading, 2- Identify the types of projects..
Units	• Unit 3.1: Types of projects and urban planning projects • Unit 3.2: Infrastructure projects and Industrial projects •
Readings	1- Gray, R. and Larson, K., Project Management: The Managerial Process, McGraw Hill, Irwin, New York, NY, 2002.
Activity	**Overview**
	Assignment : Using the WWW search **Assignment : Prepare a research proposal**
Module 4	**Assessment of Projects**
Key Concepts	Assessment, Environmental
Overview	Environmental impact of projects: Negative and positive impacts (direct and indirect). The aim is the assessment of projects- both nationally and internationally- in order to avoid the negative consequences of projects on the environment.
Aim	The overriding aim of this module is to equip students with assessment of projects on the environment
Learning Outcomes	At the end of this module learners will be able to:

	1- Analyse the environmental impact of projects
Units	• Unit 4.1:: Environmental impact of projects • Unit 4.2 Assessment of projects
Readings	2- Harris, R. and McCaffer, D., Modern Construction Management, Black Well Science, London, U.K., 2002.
Activity	**Overview**
	Assignment : Using the WWW search for different inventions. **Assignment : Prepare a research proposal**
Module 5	**Compatibility of Projects**
Key Concepts	Compatibility, environmental
Overview	The approved rates and criteria for the compatibility of projects with environmental topics.
Aim	The overriding aim of this module is to equip students to apply the compatibility with the environmental topics
Learning Outcomes	At the end of this module learners will be able to: 1- Apply the approved rates and criteria for the compatibility of projects with environmental topics.
Units	• Unit 5.1: Criteria for the compatibility of projects
Readings	2- Harris, R. and McCaffer, D., Modern Construction Management, Black Well Science, London, U.K., 2002.
Activity	**Overview**
	Assignment : Using the WWW search for different inventions. **Assignment : Prepare a research proposal**

CLIMASP COURSE SYLLABUS

Course Syllabus

Course Code: PCR123

Fundamentals of Thermodynamic

Aswan University, Faculty of Energy Engineering, Departments of Mechanical Power Station and High Voltage Networks,

Spring Semester, 2013-2014

Instructor Information

Instructor: Dr. Waleed Abdel-Fadeel
Location: Faculty of Energy Engineering
Telephone: Office – +20 3481234
Office Hours: Tuesday 11.00 - 14.00, Wednesday 11.00 – 14.00
E-mail: wfadeel@yahoo.com
Website:

Course Identification

Course Coder:	PCR123
Level:	100
Course Name:	Thermodynamic Fundamentals
Course Location:	Faculty of Energy Engineering
Class Times:	Thursday 9.00 - 11.00
Prerequisites:	NA
Faculty Web Page:	http://energy.aswu.edu.eg/English/Pages/default.aspx

Course Description/Overview

The subject of thermodynamics referred to as thermal science. It is of interest to students of all engineering branches, in fact to all mankind, as it deals with the most basic processes occurring in nature. The subject forms the basis for the study of a vast variety of devices such as refrigerators, air conditioners, automotive engines, aircrafts, locomotives, power plants, etc, the use of which is involved in the everyday life of almost every individual. Even the simple kitchen gadget of steam pressure cooker is designed on the basis of the principles of thermodynamics.

Course Learning Objectives

Demonstrate knowledge of basic thermodynamic concepts, ideal gases and pure substance, first low of thermodynamic on different systems. Apply the first law of thermodynamics on various engineering applications. Share ideas and work in a team in an efficient and effective manner under controlled supervision or independently.

Course Content Learning Outcomes

1- Define the concept of the energy.
2- Define the different basic concepts like properties, state, process, equilibrium, and cycles.
3- Identify the different between the ideal gases and the pure substance.
4- Understand the property relations relevant to engineering thermodynamics.
5- Understand how to deal with thermodynamic tables.

6- Identify the concept of energy and mass conservation.
7- Apply these concepts on different applications.
8- Analyse problems, conclude solutions and demonstrate creative thinking.
9- Work coherently and successfully as a part of a team in assignments.
10- Discuss results and defined his/her ideas.

Course Resources

1- Sonntag, R. E.; Borgnakke, C. and Van Wylen, G. J., Fundamentals of thermodynamics, John Wiley and Sons Inc., 1998.

2- Cengel, Y. A. and M. A., Thermodynamics: An Engineering Approach, WCB/McGraw Hill, 1998

Course Website(s)

Required Course Texts and Materials

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments/attendance/participation	20%
Midyear Exam	20%
Final Exam	60%
Total Points	**100**

Course Policies

Late Assignments

It is essential that final written exam and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

The students are expected to come to all classes. You cannot pass the class under any circumstances if you miss more than 25% of all classes. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

NA

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	16/2/2014	Basic concepts and definitions
2	23/2	System and control volume, Property and state

3	2/3	Processes and cycles
4	9/3	Work definition, Definition of heat transfer
5	16/3	Ideal gases, State equation, Specific heat at constant pressure and volume
6	23/3	Pure substances and phase equilibrium, Tables of thermodynamic properties
7	30/3	First law of thermodynamics, Internal energy and enthalpy
8	6/4	Midyear exam
9	27/4	First law for closed cycle
10	4/5	Closed and open systems: Steady flow and uniform state uniform flow
11	11/5	Application of first law of thermodynamics (reciprocating compressors)
12	18/5	Second law of thermodynamics
13	25/5	Vapour and gas cycles
14	1/6	Final Exam

Module 1	Basic concepts and definitions
Key Concepts	Property, state, Processes, cycles
Overview	The subject of thermodynamics referred to as thermal science. It is of interest to students of all engineering branches, in fact to all mankind, as it deals with the most basic processes occurring in nature.
Aim	The overriding aim of this module is to equip students with the basic concepts.
Learning Outcomes	At the end of this module learners will be able to: 1- Define the concept of the energy 2- Define the different basic concepts like properties, state, process, equilibrium, and cycles.
Units	• Unit 1.1: System and control volume, • Unit 1.2: Property and state • Unit 1.3: Processes and cycles
Readings	1- Sonntag, R. E.; Borgnakke, C. and Van Wylen, G. J., Fundamentals of thermodynamics, John Wiley and Sons Inc., 1998.
Activity	**Overview** Assignment : Using the WWW search Assignment : Prepare a research proposal
Module 2	**Work and heat**
Key Concepts	Work, heat
Overview	The work and heat are a kind of energy.
Aim	The overriding aim of this module is to equip students with the meaning of

	heat and energy.
Learning Outcomes	At the end of this module learners will be able to: 1- Know the difference between heat and work 2- Identify the different between the ideal gases and the pure substance. 3- Understand the property relations relevant to engineering thermodynamics. 4- Understand how to deal with thermodynamic tables
Units	• Unit 2.1: definitions • Unit 2.2: Ideal gas • Unit 2.3: pure substances
Readings	2- Cengel, Y. A. and M. A., Thermodynamics: An Engineering Approach, WCB/McGraw Hill, 1998
Activity	**Overview**
	Assignment : Using the WWW search Assignment : Prepare a research proposal
Module 3	**First law of thermodynamics**
Key Concepts	First law of thermodynamics
Overview	Apply the first law of thermodynamics on various engineering applications
Aim	The overriding aim of this module is to equip students with applications of the first law of thermodynamics.
Learning Outcomes	At the end of this module learners will be able to: 1- Identify the concept of energy and mass conservation 2- Apply these concepts on different applications
Units	• Unit 3.1: Understand how to deal with thermodynamic tables. • Unit 3.2: Closed cycle and Open cycle • Unit 3.3: Applications

Readings	1- Sonntag, R. E.; Borgnakke, C. and Van Wylen, G. J., Fundamentals of thermodynamics, John Wiley and Sons Inc., 1998.
Activity	**Overview** Assignment : Using the WWW search **Assignment : Prepare a research proposal**
Module 4	**Second law of thermodynamics**
Key Concepts	Second law of thermodynamics
Overview	The meaning of entropy and losses
Aim	The overriding aim of this module is to equip students with the meaning of entropy and kind of losses
Learning Outcomes	At the end of this module learners will be able to: 1- Identify the second law of thermodynamics 2- Identify the entropy and losses
Units	• Unit 4.1: Second law of thermodynamics • Unit 4.2: Entropy
Readings	1- Sonntag, R. E.; Borgnakke, C. and Van Wylen, G. J., Fundamentals of thermodynamics, John Wiley and Sons Inc., 1998.
Activity	**Overview** Assignment : Using the WWW search. **Assignment : Prepare a research proposal**
Module 5	**Vapour and gas cycles**
Key Concepts	Vapor, gas, cycles
Overview	Producing and consuming energy depends on cycles
Aim	The overriding aim of this module is to equip students with the different cycles.
Learning Outcomes	At the end of this module learners will be able to:

	1- Identify vapour cycles 2- Identify gas cycles
Units	• Unit 5.1: Vapour cycles • Unit 5.2: Gas cycles
Readings	2- Cengel, Y. A. and M. A., Thermodynamics: An Engineering Approach, WCB/McGraw Hill, 1998
Activity	**Overview**
	Assignment : Using the WWW search for **Assignment : Prepare a research proposal**

EGYPT HUSD

CLIMASP COURSE SYLLABUS TEMPLATE Course Syllabus

Course Number: 2110

Business Ethics

Heliopolis University for Sustainable Development, Faculty of Business and Economics, Department of Enterprise,

Instructor Information

Instructor: Office Location: Telephone: Office Hours: E-mail: Website:

Mr. Omar Eldahan Department of Enterprise, Faculty of Business and Economics

omar.eldahan@hu.edu.eg www.hu.edu.eg

Course Identification

Course Number: Course Name:

Course Location: Class Times: Prerequisites: Faculty Web Page:

2110 Business Ethics

Heliopolis University for Sustainable Development

Introduction to Marketing www.hu.edu.eg

2013/2014

Course Description/Overview

This course responds to a need for students and businesses to understand the role of ethics within the business environment. The course aims to dispel the myth that only the dishonest and unscrupulous companies are those that succeed. Furthermore, the course explains to the students the importance of aligning the business's practices, vision, and mission with ethical practices. Furthermore, students will be required to think critically about the different circumstances surrounding ethical choices and will be taught how to deal with them. Finally, the students will be taught how not to trap themselves within a dilemma (or tri-lemma) and will be taught how to find creative

solutions to difficult ethical problems. Most of these aspects will be taught within the scope of climate change. Specific case will be given regarding the debate around climate change as well as around companies seeking to address this problem. Furthermore, students will be asked to find creative ways to align business's strategies (and profitability) with addressing climate change.

Course Learning Objectives

The overarching goals of this course are: a) to teach students about the concepts of ethics, virtue, and values; b) raise awareness of the importance of ethics in a business environment, and c) Use the concepts practically in enhancing the performance of the company and to help in development of the company and the surrounding community.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Discuss the underlying theories regarding ethics
2. Understand the different concepts of ethics and their underlying foundations
3. Understand how aligning ethics with the company's practices can help in its long term success and growth
4. Understand ethics from the standpoint of climate change and environmental harm
5. Realize the ethics of sustainable development
6. Incorporate ethical activates into an enterprise

7. Understand the challenges of global warming and the role ethics has to play in mitigating its impact

Course Resources

Course Website(s) **Required Course Texts and Materials** Hands-out prepared by the instructor for the class

DeGeorge, R. T. (2009). *Business Ethics* (7th ed.). Pearson.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

Grading Policy

Grades can be based on the following:

Quizzes	20 %
Final Exam	30

	%
Assignments	30 %
Class participation	20 %
Total Points	**100 %**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Any submission that is less than a week late will get only half the marks; more than a week late and it will not be accepted

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal

expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by- case basis. **Important Dates to Remember**

Course Schedule

Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)

Course Overview

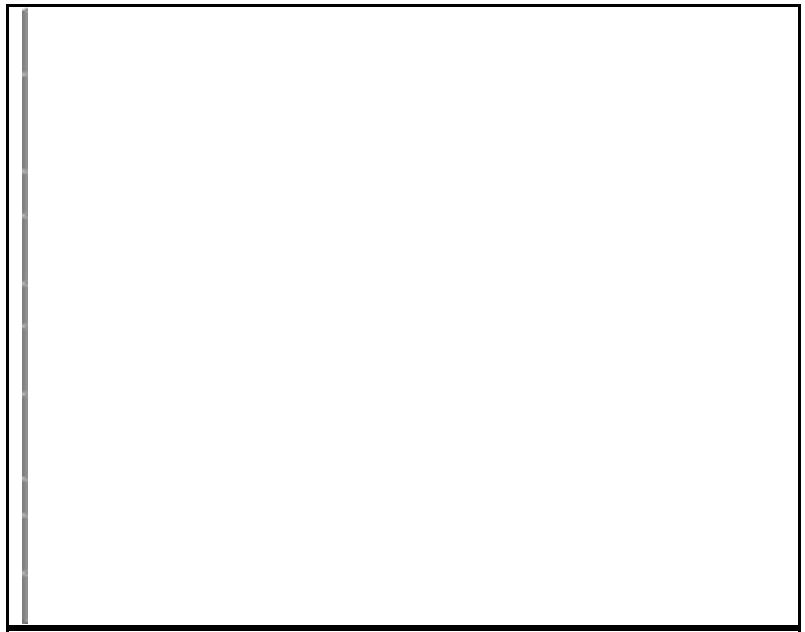
Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection

The different concepts of ethics Case studies reflecting different ethical choices Utilitarianism, Deontology, and Virtue Ethics The meaning of ethics, virtue, values, and other philosophical constructs

Climate Change and its challenges to the traditional economy and business practices

Ethics and climate change, where ethics is aligned with environmental values Corporate Social Responsibility

Worker’s rights and duties



Week
1
2
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4	
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10	Ethical management practices
11	Global issues and international obligations
12	Corporate Governance
1	The new Moral Imperative for business

3	

APENDIX II: The CLIMASP Course Modules Template Example

Course Curriculum and Hypermedia

Module 1 Curriculum: Different Types and Functions

CLIMASP COURSE SYLLABUS TEMPLATE Course Syllabus

Course Number: 2271

Green Marketing

Heliopolis University for Sustainable Development, Faculty of Business and Economics, Department of Enterprise,

Instructor Information

Instructor: Office Location: Telephone: Office Hours: E-mail: Website:

Dr. Omar Ramzy Department of Enterprise, Faculty of Business and Economics

omar.ramzy@hu.edu.eg www.hu.edu.eg

Course Identification

Course Number: Course Name: Course Location: Class Times: Prerequisites: Faculty Web Page:

2271 Green Marketing Heliopolis University for Sustainable Development

www.hu.edu.eg

2013/2014

Course Description/Overview

This course responds to a contemporary need for increase social awareness of corporations to take place in order to address the burning needs of society. Through this course, students will be taught on the different aspects of CSR such as community building and outreach, human development, giving back to the surrounding community, being a good neighbor, reducing emissions and pollution, the benefits of CSR, and the marketing potential for a socially responsible company. Furthermore, the course focuses on the relationship between CSR and addressing Climate change on the micro and macro marketing scale.

Course Learning Objectives

The overarching goals of this course are: a) to provide an understanding of the concepts and theories behind CSR; b) raise awareness of the concepts of CSR and how they apply to real industries and situations, and c) Use the concepts practically to enhance the total value of the company and its brand through an improved perception among its customer base.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

8. Discuss the underlying theories regarding CSR

9. Differentiate between donating money and actual CSR practices
10. Understand how CSR can enhance the brand image of a company
11. Be able to communicate the CSR actions of an institution
12. Turn CSR into a full-fledged strategy of an institution
13. Apply the concepts in a practical situation
14. Understand the challenges of global warming and businesses role in facing the threat
15. Realize the potential for creating brand awareness and loyalty while adding value to your product through addressing climate change in company practices

Course Resources

Course Website(s) Required Course Texts and Materials Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

Grading Policy

Grades can be based on the following:

Mid-Term Exam	30 %
Final Exam	40 %
Assignments	20 %
Class attendance	10 %
Total Points	100 %

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Any submission that is less than a week late will get only half the marks; more than a week late and it will not be accepted

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by- case basis. Important Dates to Remember

Course Schedule

Week	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)

1	Course Overview Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	The origin of CSR, how it started and where it has come
3	Why focus on CSR?
4	The different methods of applying CSR
5	Marketing CSR and using it in the advertising efforts
6	CSR addressing climate change, challenges and opportunities
7	Is going green CSR, or just good business?
8	Community building, outreach, development, assistance, and communication. Focusing on the C of CSR
9	Society and its needs and issues. Focusing on the S of CSR
10	Why is a company “responsible” for giving back to the community? Focusing on the R of CSR
11	How all of the individual elements make a strong, and sustainable company through CSR

12	Sustainable Development as CSR
13	Green Marketing Project

Course Syllabus Developmental Economics

Instructor Information

Instructor: Office Location: Telephone: Office Hours: E-mail: Website:

Maximilian Abouleish ... ... maximilian.abouleish@hu.edu.eg

Course Identification

Course Number: Course Name: Course Location: Class Times: Prerequisites: Faculty Web Page:

1

2203 Developmental Economics ... ... Introduction to Integral Economics (2233) ...

Course Description/Overview

Participants of this course will get an overview on Co-evolutionary Economics and Conscious Economics as a basis for the subsequent course Development Economics II. This parts of the Eastern Economic Path of Developmental Economics is concerned with (1) the extent our society is economically grounded in its particular culture and how do within our society culture and economy co-evolve, and (2) the development of our economy as a means whereby the culture and consciousness of human being and consciousness of the human being and humanity is advanced.

Course Learning Objectives

16. To provide a broad knowledge base for a culturally based developmental economics

17. To compare and contrast communally based self-sufficiency with a culturally based developmental economy

18. To connect conscious evolution, micro enterprise-wise, with developmental economics, macro economicswise Course Content Learning Outcomes Upon successful completion

of this course, students will be able to:

- To be able to align culture with economics
- To distinguish between a local-global developmental, and a self- sufficient, local economy
- To be able to internalize development, individually and societally, psychologically and economically
- To position a developmental economy within a conventional economic context

Furthermore, students will gain the following transferable skills and other attributes:

- Internalize developmental principles and processes
- Build a developmental approach into your work and study processes
- Be able to link the local and traditional with the global and modern 2

- Internalize the connectedness between nature and culture

Learning and teaching strategies

- Lectures/seminars/group exercises – on building up a developmental orientation
- Drawing on the history and culture of your region, on the one hand, and on the applied arts, on the other, to cultivate a developmental orientation
- Practical projects focused on self, organizational and communal development
- Oral, visual and written presentation focused on patterns of connection, unfolding narratives, and an overall developmental approach to economics Course Resources Course Website(s) Required Course Texts and Materials

- Bond, G. (2004). Buddhism at Work: Community Development, Social Empowerment and the Sarvodaya Movement. Bloomfield: Kumarian Press.
- Large, M. (2010). Commonwealth: For Free, Equal, Mutual and Sustainable Society. Strond:

Hawthorn Press.

- Lessem, R. & Schieffer, A. (2010). Integral Economics: Releasing the Economic Genius of your Society. Chapters 2, 9-11, Epilogue. Farnham: Gower-Ashgate.

- Schumacher, E.F (2011). Small is Beautiful: A Study of Economics as if People Mattered. New York: Vintage Books.

3

Optional Course Texts and Materials

Course Policies

Grading System Assignments and Grading Scheme

This course is assessed through course and fieldwork, as well as formal assessment, with a pre-emphasis on activity, enterprise and the achievement of results.

Grading Policy

Grades can be based on the following: (Example)

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify the professor before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 25% of the grade.

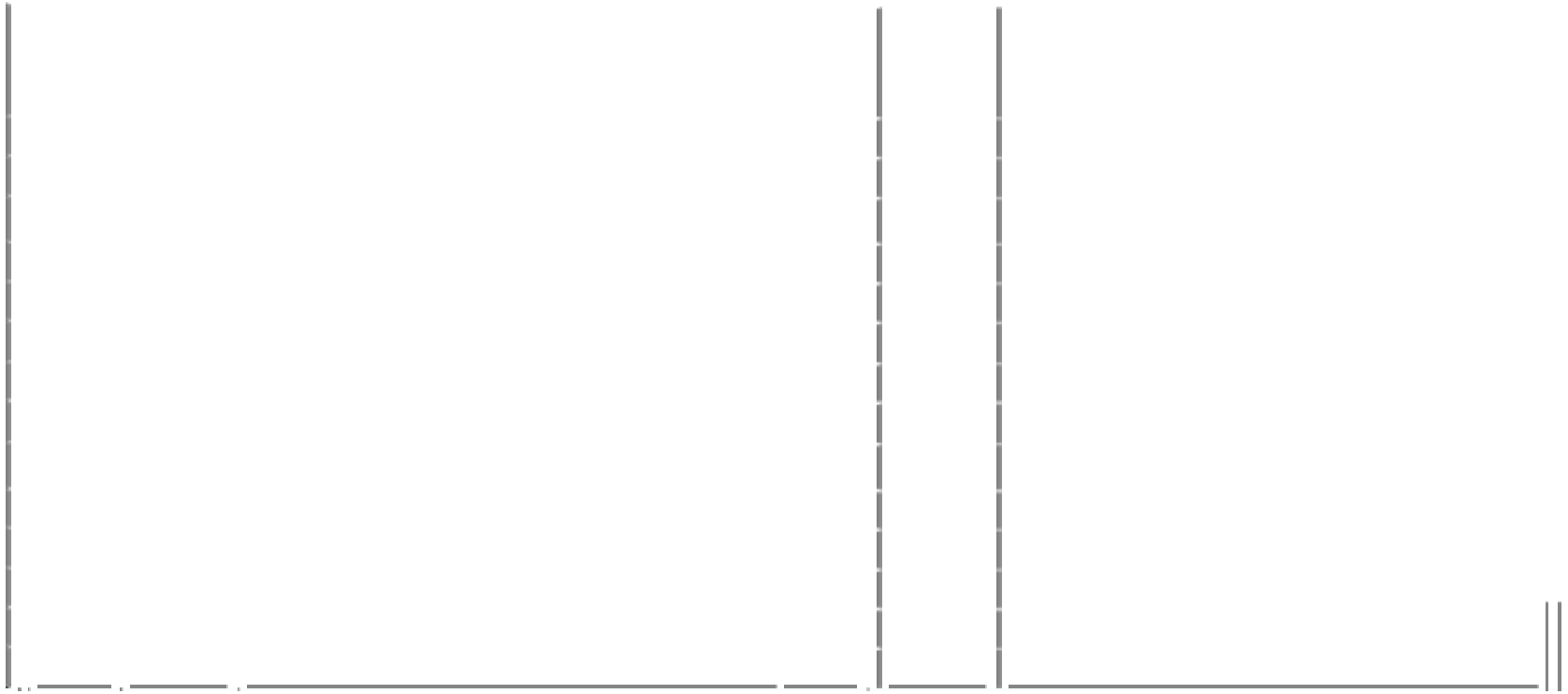
Assignments and/or Presentation	25%
Exams (Mid-term and Final)	50%
Class attendance/participation	25%
Total Points	100

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

5

Course Schedule



Week Date

1 2 3

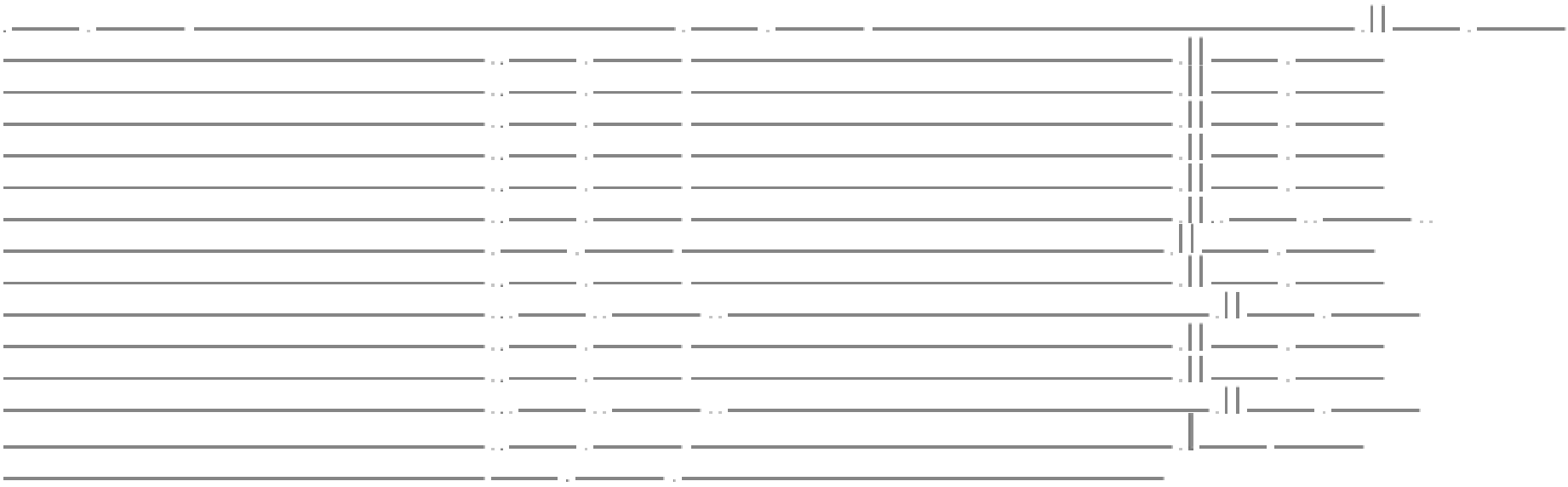
4 5 6 7 8 9

10 11 12 13 14-16

Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules) Introduction Module 1 Module 1 (continued)

Buffer Module 2 Module 2 (continued) Module 3 Module 3 (continued) Midterm Exam

Module 4 Module 4 (continued) Buffer/Repetition Exam Buffer



6

APENDIX II: The CLIMASP Course Modules Template Example

Modules Overview

Course

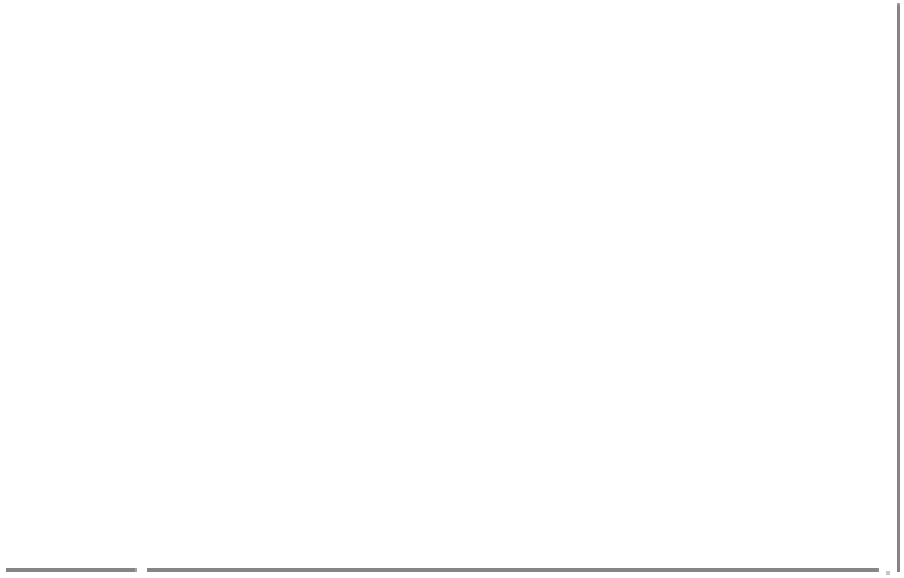
Developmental Economics

Key Concepts

- Provides the philosophical Foundation for the missing co- evolutionary Aspect

of an Integral Economy

- Sees the World as a Patchwork Quilt of loosely interconnected, co-evolving social and ecological Systems
- Transcends Individualism and Globalism



Overview

We now begin to release the eastern economic Gene-ius through what we term

‘developmental’ economics. Surprisingly perhaps for you, the reader, we ground the archetypal ‘east’ in the work of ‘western’ environmental economist Richard Norgaard from Berkeley, California, and particularly in his work on Development Betrayed : Toward a Co-evolutionary Re-visioning of Economics’. For what we have found, and indeed what has alarmed us, is that there are virtually no distinct economic voices – that is distinctly ‘eastern’ in nature and scope – coming from the geographical east, at least from a theoretical perspective. As the archetypal ‘east’ for us represents the spiritual and cultural dimensions of a society and has thereby a particular inclination towards holism, we have long been seeking to identify – in particular in the geographical east of our world, such as India, China or Japan – a culturally and spiritually grounded approach to macro economics, as opposed to micro enterprise, building on the ‘eastern’ notion of the evolution of consciousness. Perhaps because of the all-pervasive force of today’s mainstream economics, we have by and large failed to

7

	discover such an approach. With Norgaard though, we came across a formidable,

	holistic economic voice, focusing on what we term the 'developmental'. This is set in the context of the evolution of a particular society, rather than on 'development', which is arguably a 'western' imposition of modernization on any society.
Aim	...
Learning Outcomes	•...
Units	Unit 1.1 ...
Readings	• □Norgaard, R.B. (1994). Development Betrayed: The End of Progress and a Co- evolutionary Re-visioning of the Future. London: Routledge. • □Capra, F. (1991). Tao of Physics. Boston: Shambhala. • □Bell, D. (1976). The Coming of Post-Industrial Society. New York: Basic Books. • □Lal, D. (2000). The Poverty of Development Economics. Cambridge: The

	MIT Press.
Activity	Overview ...
	Assignment/Exam
Module 2	Consciousness, power and economics: an “eastern” developmental orientation
Key Concepts	• An ecosytemic and holistic Approach that applies Culture, Spirituality and Philosophy to Economics • Aiming to renew Individual, Organization and Society • Turning from Development to Transformation
Overview	We now turn to the late and great E.F. Schumacher, who, German by origin, drew intensely on eastern philosophies, in particular Buddhism, in his ‘economics as if people mattered’. His holistic orientation as an economist, able to link individual and societal evolution, cultural and economic development, knowledge and wisdom, agriculture and industry, the material and the immaterial, economic theory and

	practice, makes him an ideal ‘eastern’

8

	protagonist for an emergent developmental economy. Metaphysical reconstruction of economics via a higher level of consciousness is a keynote of Schumacher’s work, as well as for Argentinean former World Banker Mario Kamenetzky. Moreover, we conclude this chapter with the Sri Lankan movement ‘Sarvodaya’ (meaning: awakening for all) as a practical application of Schumacher’s approach to culture and consciousness. This movement, encompassing over 15.000 villages, links purposefully and successfully culturally rooted spiritual evolution with economic development, thereby being also a force for cultural reconciliation and nation building.
Aim	...
Learning Outcomes	•...

Units	Unit 1.1 ...
Readings	• Schumacher, E.F. (1974). Small is Beautiful: Economics as if People Mattered. London: Abacus. • Schumacher, E.F. (1977). A Guide for the Perplexed. London: Abacus. • Kamenetzky, M. (1999). The Invisible Player: Consciousness as the Soul of Economic, Social and Political Life. Vermont: Park Street Press. • Gebser, J. (1986). Ever Present Origin. Athens, OH: Ohio University Press. • Field, L. (2007). Business and the Buddha: Doing Well by Doing Good. Somerville: Wisdom Publications.
Activity	Overview ...
	Assignment/Exam

Module 3	Culture, politics and economics – the nature and scope of associative economics
Key Concepts	• Culture is seen as the rightful Place for Competition, to achieve personal Freedom and Liberation

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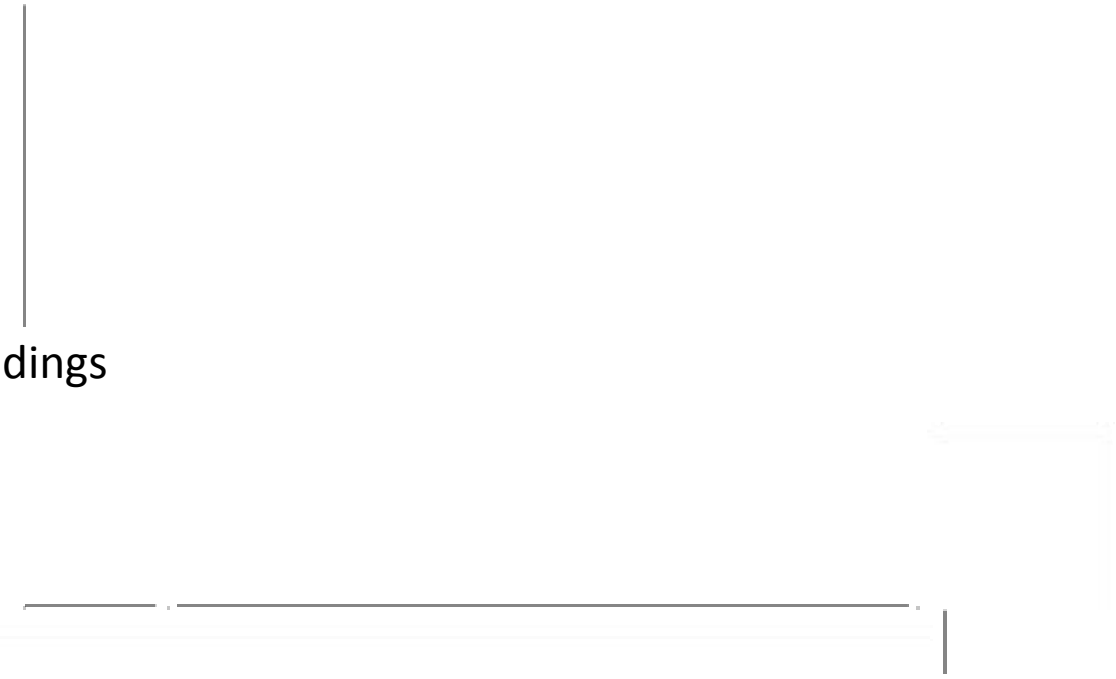
	• □Economics, in Contrast, is about Fraternity • □Politics, or human Rights, is about Equality. • □Economics focusses on the real Needs of Society, and its organizing Form is the Association. • □Capital is regarded as Means of Self-expression, individual Evolution and Knowledge Creation.
Overview	With his Threefold Commonwealth, Rudolf Steiner offers a fundamental reinterpretation of a developmental economy and society, distinguishing three independent as well as interdependent (co-evolving) societal parts: economics,

	politics and culture, as opposed to Norgaard's two (economics and culture). He sees culture as the rightful place for competition, in order to achieve personal freedom and liberation. Economics, in contrast for Steiner, is about fraternity, and politics is about equality. In this combination, an individual strives to fully actualize his or her personal skills in the field of culture, which, in turn, informs his or her unique and knowledgeable contribution to economic life. The focus of economics, then, is on the real needs of society, and its organizing form is the association. Consequently capital is seen in a new light. As articulated by Steiner's followers Folkert Wilken and Christopher Houghton Budd, capital becomes a means of self- expression, individual evolution and knowledge creation. Wilken was among the first to recognize the intellectual, cultural, even spiritual dimension of capital and its rootedness in accumulative capacities of previous generations. Therefore, both, Associative Economics and the Capital Economy introduced in this chapter, can be regarded as suitable building blocks for a developmental economy, addressing most especially liberty (culture) and fraternity (economy) in such co-evolution.
Aim	...

Learning Outcomes	•...
Units	Unit 1.1 ...

10

- Steiner, R. (1977). Towards Social Renewal. Edinburgh: Rudolf Steiner Press.
- Wilken, F. (1982). The Liberation of Capital. London: Allen and Unwin.
- Houghton Budd, C. (2003). Metamorphosis of Capitalism. Canterbury: Associative Economics Institute.
- Wilken, F. (1982). The Liberation of Capital. London: Allen and Unwin.
- Nonaka, I. & Takeuchi, H. (1995). The Knowledge Creating Company. Oxford: Oxford University Press.


Readings
Activity
Overview
...
Assignment/Exam

- □llustrates how an active Engagement with cultural Grounds on a micro-level provides a Basis for organizational Development and for social, political and economic Transformation

- □Shows how a Company practicing Co-evolution establishes harmonious Relations with its Customers, Suppliers and Competitors, as well as with the Government with which it deals, and the natural Environment.

Key Concepts

Overview

Japan's Canon demonstrates developmental economics on a microeconomic level. By building on the Japanese philosophy of 'Kyosei', which means co-existence or co-evolution, the Canon case illustrates how such an original eastern cultural impulse is realized in economic practice. We witness, substantiated by Japan's economic philosopher Kensei Hiwaki, how an active engagement with cultural grounds provides, on the one microeconomic hand, a basis for organizational development. On the other macroeconomic hand, the Canon case provides insights, on how an evolved, and culturally infused variation of mainstream macroeconomic theory is put into practice. We have chosen a case

	from Japan, as there is much to learn from a country that economically excelled in the 1970s and 1980s, and lost its way economically thereafter. The reasons for this are undoubtedly complex. From our integral perspective, however, we offer as one reason, that Japan, macroeconomically, submitted to the monocultural 'western' economic mainstream, with no space to continue to integrate its own cultural, more eastern, perspective. The case of Canon, even if culturally diluted in recent times, provides micro clues for macroeconomic co-evolution.
Aim	...
Learning Outcomes	•...
Units	Unit 1.1 ...

Readings	• Hiwaki, K. (2010). Integral Development: Emergent Economics of Global Community. Farnham: Gower. • Kaku, R. (1997). The Path of Kyosei. Harvard Business Review. July/August; 75 (4): 55-63. • Sakaiya, T. (1995). What is Japan? Tokyo: Kodansha International. • Turner, G. (2008). The Credit Crunch. Housing Bubbles, Globalisation and the Worldwide Economic Crisis. London: Pluto Press.
Activity	Overview ...
	Assignment/Exam

12

CLIMASP COURSE SYLLABUS TEMPLATE Course Syllabus

Course Number: 2265

Green Marketing

Heliopolis University for Sustainable Development, Faculty of Business and Economics, Department of Enterprise,

Instructor Information

Instructor: Office Location: Telephone: Office Hours: E-mail: Website:

Dr. Omar Ramzy Department of Enterprise, Faculty of Business and Economics

omar.ramzy@hu.edu .eg www.hu.edu.eg

Course Identification

Course Number: Course Name: Course Location: Class Times: Prerequisites: Faculty Web Page:

2124 Green Marketing Heliopolis University for Sustainable Development

Introduction to Marketing www.hu.edu.eg

2013/2014

Course Description/Overview

This course responds to a contemporary and social need to better understand consumer demand for green products and the implications of this demand within the marketing system. The course helps students to clearly identify the growing demand by so-called “green” consumers for products, services and systems that support environmental and social sustainability, as well as changing patterns of consumer demand and changing propensities to pay for environmentally sustainable products and services. This course will help students to be prepared for work in a business environment where environmental and social sustainability are increasingly important and are expected

components of best practice business operations. Students will explore issues associated with product innovation and design, as well as appropriate pricing and promotion strategies for green products and services.

Course Learning Objectives

The overarching goals of this course are: a) to provide an understanding of the concepts and theories behind Green Marketing; b) raise awareness of the concepts of Green Marketing and its applications, and c) Use the concepts practically in enhancing the value of the products and services provided by a company.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

19. Discuss the underlying theories regarding Green Marketing
20. Differentiate between environmentally friendly practices and Green Marketing
21. Understand how “going green” can enhance the brand image of a company
22. Use social media to raise awareness for green practices of the company
23. Develop a green product portfolio
24. Apply the concepts in a practical situation
25. Understand the challenges of global warming and businesses role in facing the threat
26. Realize the potential for creating brand awareness and loyalty while adding value to your product through addressing climate change in company practices

Course Resources

Course Website(s) Required Course Texts and Materials Hands-out prepared by the instructor for the class

Polonsky, M. J. (1994). An Introduction to Green Marketing. Electronic Green Journal, 1(2), 1–10.

Grove, S. J., Fisk, P. R., Pickett, G. M., & Kangun, N. (1996). Going Green in the Service Sector. European Journal of Marketing, 30(5), 56–66.

Kalafatis, S. P., Pollard, M., East, R., & Tsogas, M. H. (1999). Green Marketing and Ajzen's Theory of Planned Behavior: A Cross-Market Examination. Journal of Consumer Marketing, 16(5), 441–460.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System Grading Policy

Grades can be based on the following:

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Any submission that is less than a week late will get only half the marks; more than a week late and it will not be accepted

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by- case basis. Important Dates to Remember

Course Schedule

Mid-Term Exam	30%
Final Exam	40%
Assignments	20%
Class attendance	10%

Total Points	100%
Week	Topics, Reading, Assignments and Deadlines (Details on modules)
1	Course Overview Discussion of syllabus and assignments, course require
2	Theories of Green Marketing
3	Green Products
4	Innovating and developing green business ideas
5	Green Services and Services marketing
6	Green Branding
7	Climate Change and its challenges to the traditional ec
8	The opportunities of Climate and how it can shape bus

9	Communicating the green brand
10	Developing the green product
11	The Green Supply chain
12	Green Marketing Project Day 1
13	Green Marketing Project Day 2

CLIMAPS COURSE SYLLABUS TEMPLATE Herbal Medicine

Course Number: PHG321 Heliopolis University, Faculty of Pharmacy and Drug Technology, Department of Pharmacognosy and Medicinal Plants Spring Semester, 2014-2015

Instructor Information

Instructor: Office Location: Telephone: Office Hours: E-mail: Website:

Associate Prof. Dr. Amira Abdel Motaal Pharmacy Building Office (+20) 02 265 64 140 extension 119 Tuesday 11.30- 13.30, Wednsday 14.00 – 16.00

amira.abdelmotaal@hu.edu.eg www.hu.edu.eg

Course Identification

Course Number: Course Name:

PHG 321

Herbal Medicine

Course Location: Class Times: Prerequisites: Faculty Web Page: Course Description/Overview

University Campus Monday 8:30 – 12:30 - www.hu.edu.eg

The course describes the detailed preparation and formulation of phytopharmaceuticals. Requirements for quality control and standardization of herbal drugs, legal and professional framework for production, dispensing of herbal medicines also will be covered, critical appraisal of the overall process of developing a medicine from a botanical drug, sound understanding of the importance of pharmacovigilance of herbal

medicines and finally, physician and industrial perspectives in herbal medicine.

1

Course Learning Objectives

After completion of the course the student should have the knowledge and skills that enables her/ him to understand, describe and deal with herbal remedies for different diseases. They also should recognize the medicinal value of these herbs and their importance for a sustainable health and recognize, explain and connect the basic principles, concepts, theories, pertaining to the global climate change debate using appropriate scientific language.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

a- KnowledgeandUnderstanding: a_1- Be familiar with the history of herbal medicine.

a_2-Understand the concepts of natural products manufacture. a_3-Understand the mechanism of action of herbal drugs on human

systems. a_4-Identify risks associated with the use of herbal drugs

a_5- Understanding of the preparation and formulation of phytopharmaceuticals.

a_6- Understanding of the needs and requirements for quality control and standardization of herbal drugs.

b- IntellectualSkills b_1- design a herbal approach for prevention and treatment of certain

pathological conditions. b_2-Predict herb-drug interactions based on mechanism of action.

b_3-Design a pharmaceutical care plan for a person who wishes to use herbal preparations or nutritional supplements for s specific health problem.

c- ProfessionalandPracticalSkills c_1- Act as a specialist to the public and other members of the health

care team on proper use of herbal medicine. c_2- Help the public to select useful and safe herbal products c_3- Collect the therapeutic uses of medicines including adverse reactions, interaction of medicine and their significance in treatment.

2

General and Transferable Skills d_1- Assess critical thinking.

d_2- Estinate problem solving. d_3- Integraton different fields of knowledge. d_4- Approve raise team work. d_5- Design independent learning.

Course Resources Course Website(s) Required Course Texts and Materials Hands-out prepared by the instructor are uploaded on the portal for the students.

27. 1- FundamentalsofPharmacognosyandPhytotherapy,Heinrichetal.,2004.
28. 2- Tyler'sHerbsofChoice.TheTherapeuticUseofPhytomedicine,Robbersand Tyler, 1999.
29. 3- Text Book of Natural Medicine, Pizzorno and Murray, 1999.
30. 4- Encyclopaediaofherbsandtheiruses.
31. 5- Thecompleteguidetoherbalmedicine.
32. 6- Thehealingpowerofherbs..
33. 7- BritishandEgyptianPharmacopeia.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

GPA from 1 to 4 (where 2 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	10%
Written exams	35%
Class attendance/participation	20%
Oral exams	10%
Practical exam	25%
Total Points	100

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a practical course, which means that students are expected to come to ALL classes and laboratories. You cannot pass the class under any circumstances if you miss more than three classes or three labs. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by- case basis.

Course Content

Theoretical	Estimated number of hours
Preparation and formulation of phytopharmaceuticals	2
Needs and requirements for quality control and standardization of herbal drugs	2

Legal and professional framework for production and dispensing of herbal medicines	2

4

Overall process of developing a botanical drug into a medicine	2
Importance of pharmacovigilance of herbal medicines	2
Management of system disorders using herbal products	10
Herbal medicine: physician and industrial perspectives.	2
Total	24

Course Syllabus Introduction to Integral Economics

Instructor Information

Instructor: Office Location: Telephone: Office Hours: E-mail: Website:

Maximilian Abouleish ... ... maximilian.abouleish@hu.edu.eg

Course Identification

Course Number: Course Name: Course Location: Class Times: Prerequisites: Faculty Web Page:

1

2233 Introduction to Integral Economics ... ... no prerequisites ...

Course Description/Overview

Participants of this course will critically review existing dominant models of economic thinking and how these affect the planet's health and human well-being and survival. Integral Economics gives an overview on alternative past and present economic models that

integrate economics with the earth, with society and community, with life's processes and human's creativity. Integral economics is aiming to provide a framework for the needed paradigm shifts of our time.

Course Learning Objectives

34. • To compare and contrast diverse moral underpinnings to economics

35. • To gain insight into the relationship between culture, spirituality and economics

36. • To compare and contrast self-sufficiency, with developmental, social and sustainable (living) economics

37. • To recast the Middle-East generally, and Sekem-Heliopolis specifically, as an integrator in the above light, ultimately focused on sustainable development Course Content Learning Outcomes Upon successful completion of this course, students will be able to:

- • To become adept at re-viewing economics in a cultural context

- • □Developing powers of comparative analysis and, more especially, synthesis, in economics
- • □Becoming able to discern the evolutionary development of economics
- • □Relating such an evolutionary impulse to the art and science of development
- • □Appreciating the long and wide-ranging backdrop to sustainable development

Furthermore, students will gain the following transferable skills and other attributes:

- • □To adopt a cross-cultural orientation
- • □To be able to distinguish between more, and less, evolved orientations to economics 2
- • □To appreciate the need for regression, prior to progression, in economic analysis
- • □To recognize that development of economics is a cyclical as well as a linear process

- To become adept at comparative and cross-cultural economic theorizing

Learning and teaching strategies

- Lectures/seminars/ group exercises – to internalize comparative evolution of economics
- Partaking in the "art" of development – to experience and appreciate different economic models, through music and movement, dance and drama,
- Practical projects – on comparative economic systems
- Oral, visual and written presentation – encompassing different belief systems, and economic systems, with specific reference to Sekem

Course Resources

Required Course Texts and Materials

- Abouleish, A. (2005). Sekem: A Sustainable Community in the Desert. Edinburgh: Floris.
- Chapra, U. (2008). Islam and Economic Development. New Delhi: Adam.
- Lessem, R. & Schieffer, A. (2010). Integral Economics. Releasing the Economic

Genius of your Society. Farnham: Gower-Ashgate.

- Rima, I. (2001) Development of Economic Analysis. London: Routledge. Course Policies Assignments and Grading Scheme This course is assessed through course and fieldwork, as well as formal assessment, with a pre-emphasis on activity, enterprise and the achievement of results. 3

Grading Policy

Grades can be based on the following: (Example)

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three

classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify the professor before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 25% of the grade.

Dissability

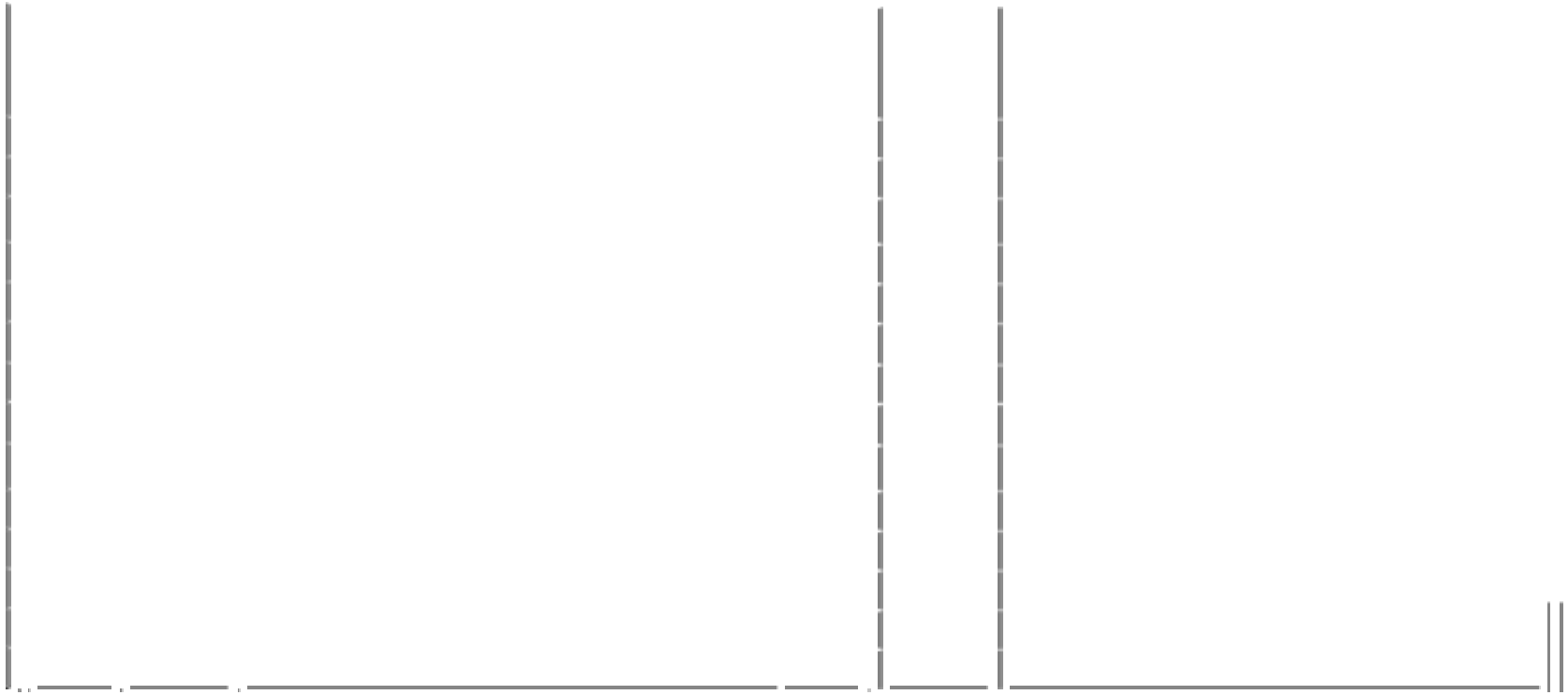
Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

4

Assignments and/or Presentation	25%

Exams (Mid-term and Final)	50%
Class attendance/participation	25%
Total Points	100

Course Schedule



Week Date

1 2 3

4 5 6 7 8 9

10 11 12 13 14-16

Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules) Introduction Module 1 Module 1 (continued)

Module 2 Module 2 (continued) Module 3 Module 3 (continued) Midterm Exam Module 4

Module 4 (continued) Module 5 Module 5 (continued) Exam

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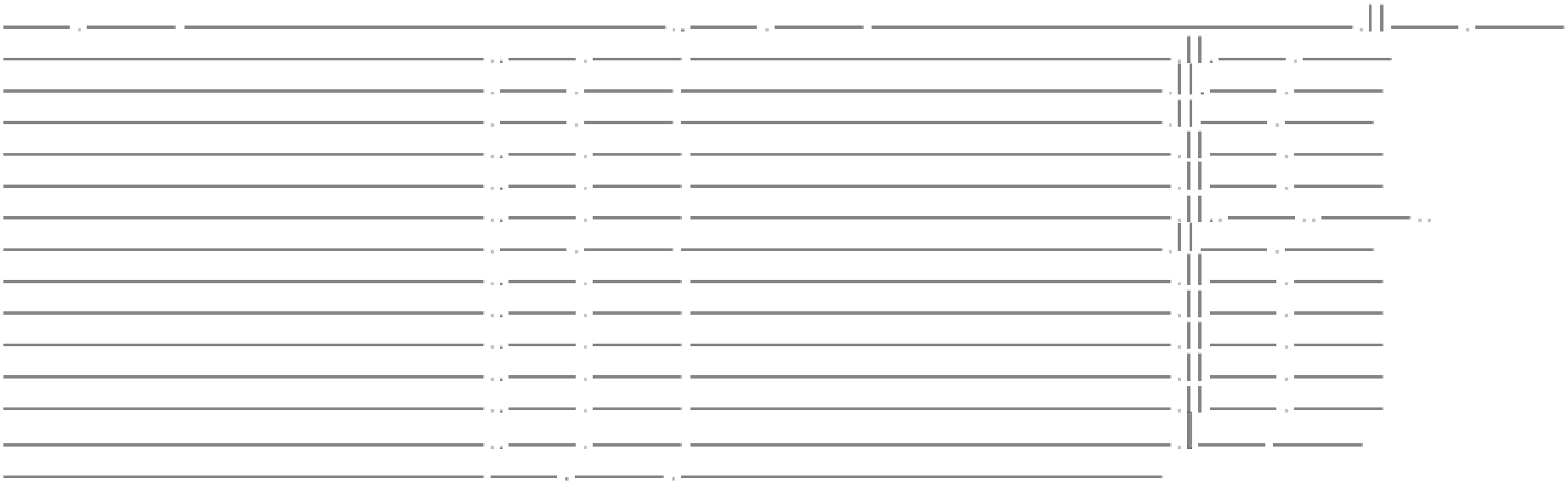


5

APENDIX II: The CLIMASP Course Modules Template Example

Modules Overview

Course	Introduction to Integral Economics
Module 1	The moral economic core
Key Concepts	...
Overview	In this module we center our Integral Economy in a moral economic core, which has its foundation in 'Religion and Humanity'. We take you then on a journey, beginning with Protestantism, as the original moral inspiration for today's economic mainstream. Thereafter, we acknowledge the urgent need to revitalize such a narrow moral economic core, and turn, in order to do so, to the rich diversity of faith based sources from all over the world; for an economy, to authentically renew itself, needs to build on, or build up, its own moral economic core. We, hence, travel around the Four Worlds, starting out with southern indigenous wisdom and move from there to

	various eastern moral cores, specifically Hinduism, Buddhism and Confucianism. Turning north, we review Catholicism in the light of e.g. so- called Distributivism, before we revisit the Christian West and its own Quaker and Protestant impulses for economic renewal. We end in the geographic center of the world with Islamic Economics. In the final analysis we conclude, that in order to renew economics from within we need to engage, interactively and co-creatively, with the full diversity of those faith based perspectives and humanistic orientations that underlie the moral economic core.
Aim	...

6

- ...

Learning Outcomes

Units

Unit 1.1 ...

Readings

...

Activity

Overview ...

Assignment/Exam

Key Concepts

...

Overview

We start out on our journey towards an Integral Economy by identifying four different ‘economic paths’, lodged in four worlds – south, east, north and west – and a center. Each of these paths represents holographically a local economic part of the global whole.

In this module we focus on the Self-sufficient Economy of the natural and communal south.

This particular stream of economics has a southern humanistic orientation, related to individual and organizational ‘being’ and, in broad terms, nature and community. In sectoral terms, we locate here the environmental sector.

In other words: The southern economic path towards economic self-sufficiency is designed to bring the foundations of ‘nature and community’ back into the economic picture, thereby addressing communal and environmental decay.

We will uncover the connection to one, or usually more than one, central moral core, which has its foundation in religion and humanity. While the new integral economic map is based on the generic principles of living social systems, each economy needs to engage with it in its own particular way, serving to release its own genius. To do so, a so-called GENE process (Grounding-Emergence-

7

	Navigation-Effect) is introduced for each economic path, that enables an economy to gradually evolve towards an Integral one, thereby fully releasing its particular

	economic GENE-IUS. Overview: Southern Economic Gene-ius • MORAL ECONOMIC CORE: Centered in Moral Inspiration / Universal Truth. To what Extent are you economically driven by a southern Source of moral Inspiration (e.g. Ubuntu), which is at the same time enriched by a compelling universal Truth (e.g. Martin Buber's 'I and Thou')? • GROUNDING in ECONOMIC COMMONS: Individual to Community. To what Extent is your Economy grounded in its particular Nature and Community? • EMERGING in GRASSROOTS ECONOMICS: Universe to Pluriverse. To what Extent are your local economic Communities lodged in a Pluriverse of Diversity, naturally and culturally? • NAVIGATING in SUBSISTENCE ECONOMICS: Efficiency to Sufficiency. To what Extent is your Economy oriented towards Sufficiency, in Theory as well as in Practice, institutionally as well as practically, and thereby providing Subsistence for all its Members?

	• □EFFECTING in SOCIAL BUSINESS: Profits to Profiting Society. To what Extent is your Enterprise participating in building a Self-Sufficient Economy, and thereby contributing Locally to alleviate Poverty?
Aim	...
Learning Outcomes	•...
Units	Unit 1.1 ...
Readings	...

8

Activity

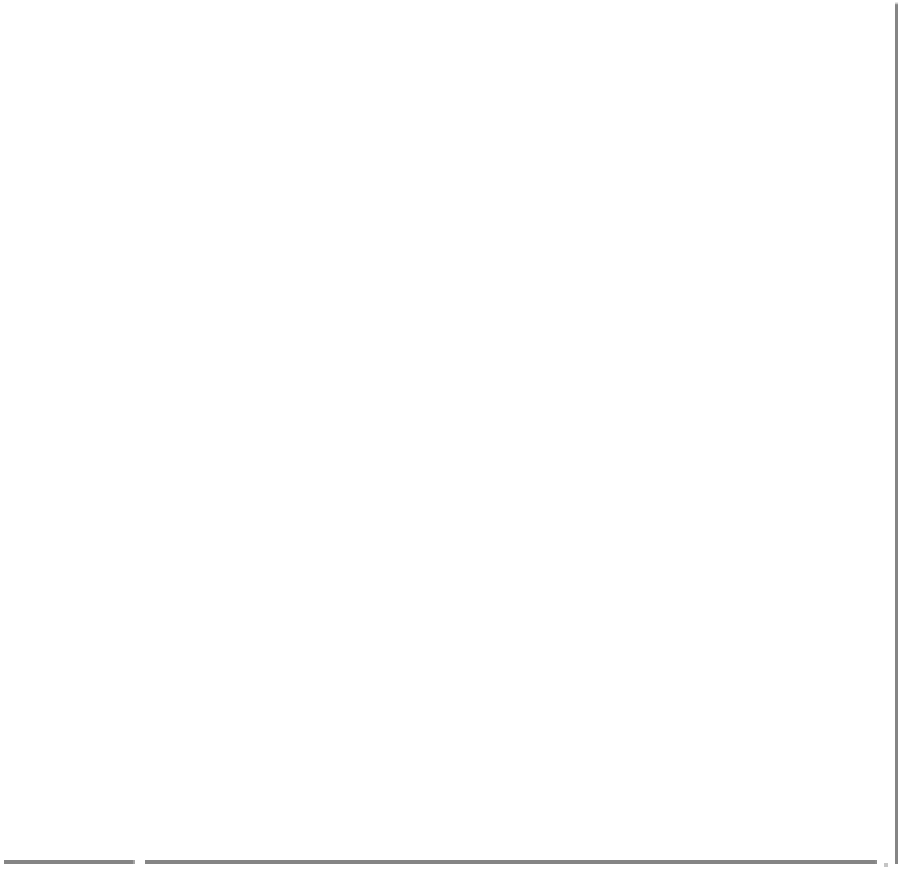
Overview

...

Assignment/Exam

Key Concepts

...



Overview

We start out on our journey towards an Integral Economy by identifying four different ‘economic paths’, lodged in four worlds – south, east, north and west – and a center. Each of

these paths represents holographically a local economic part of the global whole.

In this module we focus on the Developmental Economy of the cultural and spiritual east. This particular stream of economics has an eastern holistic orientation connects with individual and organizational ‘becoming’ and emphasizes, in general terms, culture, spirituality and consciousness. In sectoral terms, this is represented by the civic sector.

In other words: The eastern economic path towards developmental economics is building on the foundations of ‘culture and spirituality’, thereby promoting peaceful co-evolution of countries rather than ‘clashes of civilizations’.

We will uncover the connection to one, or usually more than one, central moral core, which has its foundation in religion and humanity. While the new integral economic map is based on the generic principles of living social systems, each economy needs to engage with it in its own particular way, serving to release its own genius. To do so, a so-called GENE process (Grounding-Emergence- Navigation-Effect) is introduced for each economic path, that enables an economy to gradually evolve towards an Integral one, thereby fully releasing its particular economic GENE-IUS.

9

	Overview: Eastern Economic Gene-ius • □MORAL ECONOMIC CORE: Centered in Moral Inspiration / Universal Truth. To what Extent are you economically driven by an eastern Source of moral Inspiration, which is at the same time enriched by a compelling universal Truth? • □GROUNDING in CO-EVOLUTIONARY ECONOMICS: Economic Development to Economic Mosaic. To what Extent is your Society economically grounded in its particular Culture and how do Culture and Economy co-evolve within your Society? • □EMERGING in CONSCIOUS ECONOMICS: Energy to Consciousness. To what Extent is the Development of your Economy a Means whereby the Culture and Consciousness of the Human Being and Humanity is enhanced? • □NAVIGATING in ASSOCIATIVE ECONOMICS: Competition to Association. To what Extent is the Economy of your Society focussing on 'Real Needs' and is organized around Association rather than Competition, building purposefully and

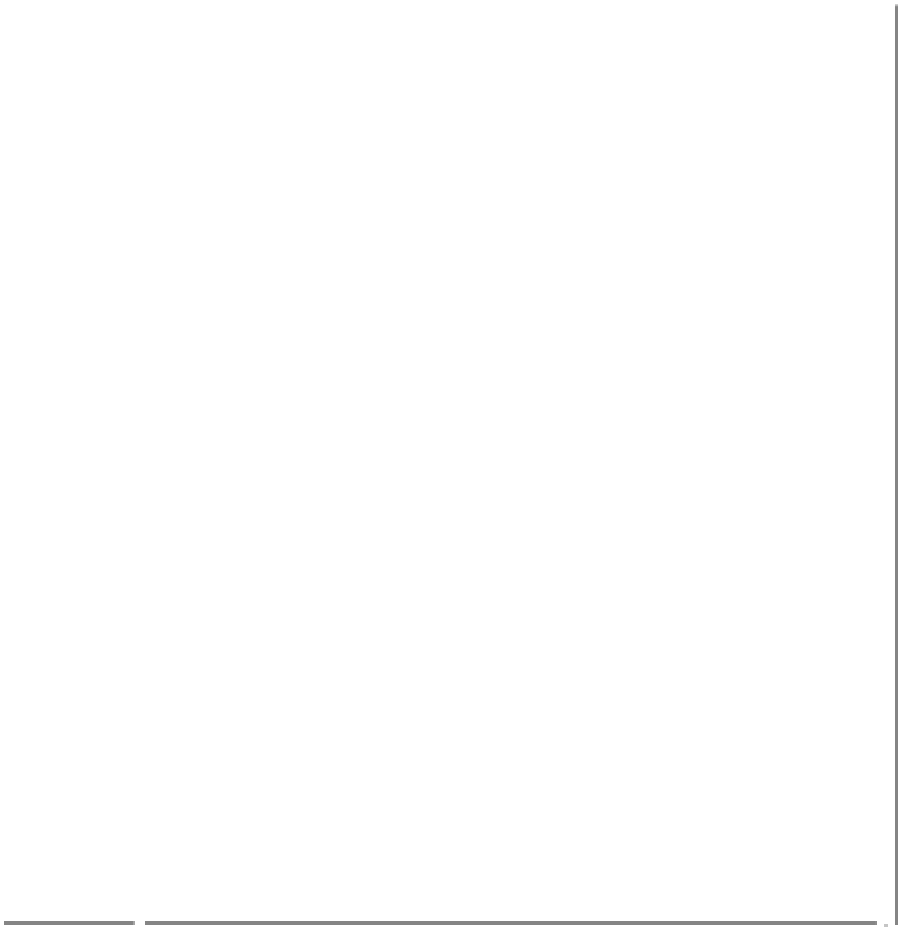
	interdependently on Culture, Politics and Economics? • □EFFECTING in DEVELOPMENTAL ENTERPRISE: Survival to Co- Evolution. To what Extent is your Community or Enterprise co-evolving with its multiple Stakeholders, thereby becoming an Agent for a Developmental Economy?
Aim	...
Learning Outcomes	•...
Units	Unit 1.1 ...
Readings	...
Activity	Overview ...

10

Assignment/Exam

Key Concepts

...



Overview

We start out on our journey towards an Integral Economy by identifying four different

‘economic paths’, lodged in four worlds – south, east, north and west – and a center. Each of these paths represents holographically a local economic part of the global whole.

In this module we focus on the Social Economy of the scientific and technological north. This particular stream of economics has a northern rationalistic orientation pertains to individual and organizational ‘knowing’, and focuses, in broad terms, on science and technology. In sectoral terms, the public sector is positioned here.

In other words: The northern economic path towards social economics is building on social and natural ‘science and technology’, thereby enabling a society open for continuous improvement, while simultaneously addressing social injustice.

We will uncover the connection to one, or usually more than one, central moral core, which has its foundation in religion and humanity. While the new integral economic map is based on the generic principles of living social systems, each economy needs to engage with it in its own particular way, serving to release its own genius. To do so, a so-called GENE process (Grounding-Emergence- Navigation-Effect) is introduced for each economic path, that enables an economy to gradually evolve towards an Integral one, thereby fully releasing its particular economic GENE-IUS.

Overview: Eastern Economic Gene-ius

11

	• □MORAL ECONOMIC CORE: Centered in Moral Inspiration / Universal Truth. To what Extent are you economically driven by a northern Source of moral Inspiration, which is at the same time enriched by a compelling universal Truth? • □GROUNDING in COMMON GOOD ECONOMICS: Economy to Society. To what Extent is your Society's Economy designed to bring about humane Communities and Enterprises? • □EMERGING in SOCIAL LEARNING AND THE NETWORK SOCIETY: Hierarchy to Network. To what Extent is your Society open for Learning, responding to the economic Opportunities but also to the social Challenges posed by a Network Society? • □NAVIGATING in OPEN ECONOMICS: Open Markets to Learning Society. To what extent does your Society promote Pluralism And exchange of Ideas, and is it

	open for continuous Improvement, through its social and economic Institutions? • □EFFECTING in COOPERATIVE ENTERPRISE: Enterprise to Democracy. To what Extent does your Community or Enterprise respond to continuous technological Change and social Challenges, in a cooperative and democratic Manner?
Aim	…
Learning Outcomes	•…
Units	Unit 1.1 …
Readings	…
Activity	Overview …
	Assignment/Exam

Module 5	Sustainable Economics: From New Economics to Sustainable Enterprise

12

Key Concepts	...
Overview	We start out on our journey towards an Integral Economy by identifying four different 'economic paths', lodged in four worlds – south, east, north and west – and a center. Each of these paths represents holographically a local economic part of the global whole. In this module we focus on the Sustainable Economy of the finance and enterprise based west. This particular stream of economics has a western pragmatic orientation, connected to individual and organizational 'doing', and, in more general terms, (western) finance, enterprise, and management. In sectoral terms, this is represented by the private sector. In other words: The western economic path towards sustainable economics is building on the foundations of 'finance and enterprise', redesigned to enable sustainable

	enterprises and communities, contributing to restoring the earth. We will uncover the connection to one, or usually more than one, central moral core, which has its foundation in religion and humanity. While the new integral economic map is based on the generic principles of living social systems, each economy needs to engage with it in its own particular way, serving to release its own genius. To do so, a so-called GENE process (Grounding-Emergence- Navigation-Effect) is introduced for each economic path, that enables an economy to gradually evolve towards an Integral one, thereby fully releasing its particular economic GENE-IUS. Overview: Eastern Economic Gene-ius • MORAL ECONOMIC CORE: Centered in Moral Inspiration / Universal Truth. To what Extent are you economically driven by a western Source of moral Inspiration, which is at the same time enriched by a compelling universal Truth?

13

	• □GROUNDING in NEW ECONOMICS: Economics to Ecology. To what Extent

	is the economic Activity of your Society rooted in ecological Principles that sustain Life? • □EMERGING in REAL ECONOMICS: Domination to Partnership. To what Extent is your Economy transforming itself from a Paradigm of Domination to Partnership and from Phantom Wealth to Real Wealth? • □NAVIGATING in WELL-BEING ECONOMICS: Wealth to Well- being. To what Extent is your Society oriented towards generating and measuring real Wealth, and is it institutionally configured, and educationally oriented, accordingly? • □EFFECTING in SUSTAINABLE ENTERPRISE. Growth to Sustainability. To what Extent is your Community or Enterprise modeled upon Nature, thereby sustainable and restorative, building up human, natural and financial Capital?
Aim	…
Learning	•…

Outcomes	
Units	Unit 1.1 ...
Readings	...
Activity	Overview ...
	Assignment/Exam
	Assignment/Exam

14

CLIMAPS COURSE SYLLABUS TEMPLATE

Introduction to water Engineering Course Number: F13WAT214

Heliopolis University, Faculty of Engineering, Department of water Fall Semester, 2014-2015

Instructor Information

Instructor: Prof. Dr. Rasha Elkholy Office Location: Engineering Building Telephone: Office (+20) 02 265 64 140 extension 117 Office Hours: Sunday till Thursday from 8.00am to 4.00 pm E-mail: rasha.elkholy@hu.edu.eg Website: www.hu.edu.eg

Course Identification

Course Number:

Course Name: Course Location: Class Times: Prerequisites: Faculty Web Page:

F13WAT214

Introduction to Water Engineering

University Campus

- www.hu.edu.eg

Course Description/Overview

The course is an introduction to building materials, soil mechanics, engineering of water supply and sanitation, waste resources management, water management and quality. It also introduces water structures, groundwater engineering, hydraulic engineering, desalination and the Processes of water and waste water treatment. It highlights the impact of climate changes on water resources.

Course Learning Objectives:

Our student should gain the right understanding that How global warming impacts water. Water in its various forms is always on the move, in a complex process known as the water cycle. Global warming is already having a measurable effect on this cycle, altering the amount, distribution, timing, and quality of available water. Water users – from communities, to industries, to ecosystems – are in turn affected: their activities and functions depend, either directly or indirectly, on water.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

a- KnowledgeandUnderstanding:

1- Describe the engineering approach of water supply and sanitation 2- Discuss the waste resources management 3- Explain Water management and quality

b- IntellectualSkills

1- Rain versus snow can make a critical difference 2- Water quality affects people and ecosystems 3- The tide is rising.

4- Human activities are the main reason for the global warming.

c- ProfessionalandPracticalSkills

1-

d- General and Transferable Skills

1- Illustrate the environmental impact of water treatment. 2- Search for typical cases of study and working with others 3- Write technical reports

4- Independent learning; 5- Team working; 6- Presentation skills.

Course Resources

Course Website(s)

http://www.ucsusa.org/assets/documents/global_warming/National-Landmarks-at-Risk-Full- Report.pdf

Required Course Texts and Materials

Hands-out prepared by the instructor are uploaded on the portal for the students. 1- Engineering of water supply and sanitation 2- Waste resources management 3- Water management and quality

4- Water management and quality

We have the practical solution and technologies at hand to substantially reduce our

emissions, create a clean energy economy.

2- With climate change, the student should understand how water cycle will significantly

change.

3- Understand the concept that a warmer atmosphere can hold more water-roughly four

percent more water for every 1 Feh. Rise in temperature.

k.Pennington, January (2010) ,Introduction to Water Resources and Environmental Issues,. US Department of Agriculture, Stoneville. Cambridge University Press.

5- Structures needed for water usages Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

GPA from 1 to 4 (where 2 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	10%
Written exams	35%

Class attendance/participation	20%
Oral exams	10%
Practical exam	25%
Total Points	100

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a practical course, which means that students are expected to come to ALL classes and tutorials and Laboratories. You cannot pass the class under any circumstances if you miss more than three classes or three labs. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by

making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Lectures
1	30.09.2014	Perspectives on water and environmental issues
2	09.10.2014	The water environment of early civilizations
3	15.10.2014	The hydrologic cycle

4	22.10.2014	Water quality
5	29.10.2014	Watershed basics
6	05.11.2014	Groundwater
7	12.11.2014	Lake and Ponds
8	19.11.2014	Rivers and Stream
9	26.11.2014	Wetlands
10	03.12.2014	Dams and Reservoirs
11	10.12.2014	Drink water and Wastewater treatment
12	17.12.2014	Water allocation law
13	23.12.2014	Water conflict and problems
14	01.01.2015	Presentation on each source and its effect on Environment.

Course Teaching and Learning Methods:

1- All lectures are in electronic format using data show. 2- Tutorials are often in the form of example problems which are solved by students with the help of staff. 3- Labs and/or case study for more demonstration.

Course	Introduction to Water Engineering
Module 1	The Meaning of Ethics
Key Concepts	How global warming impacts water
Overview	When discuss with the students most of them will believe the main reason of the global warming is the moving cars exhausts. No one will realize how global warming will have significant consequences on the hydro cycle.
Aim	We must take immediate action to address global warming or these consequences will continue to intensify grow ever more costly, and increasingly affect the entire planet- including you, your family and community. And more the sea level rise is accelerating. Dangerous heat waves are becoming more common.
Learning outcomes	At the end of this module learners will be able to: 38. • Understand the crisis of fresh water we are going to face. 39. • Understand the different sours of water and how each source affect the environment.

Units	1.1: distribution of water on earth 1.2: the water and agriculture: the basis of civilization 1.2: The hydrologic cycle 2.1: Clean water as human rights 2.2: Water shed basics 2.3: Sources of water in Egypt.

Reading

k.Pennington, January (2010) ,Introduction to Water Resources and Environmental Issues,.

US Department of Agriculture, Stoneville. Cambridge University Press.

Activity

Think about :

Approximately two-thirds of the global population lives in regions that receive only one-fourth of the world's annual precipitation – a Tremendous disparity. What sorts of water management challenges does this create? What sorts of environmental challenges does this Population/precipitation imbalance create?

CLIMASP COURSE SYLLABUS TEMPLATE Course Syllabus

Course Number: 2321

Macro-Economics

Heliopolis University for Sustainable Development, Faculty of Business and Economics, Department of Enterprise,

Instructor Information

Instructor: Office Location: Telephone: Office Hours: E-mail: Website:

Mr. Omar Eldahan Department of Enterprise, Faculty of Business and Economics

omar.eldahan@hu.edu.eg www.hu.edu.eg

Course Identification

Course Number: Course Name:

Course Location: Class Times: Prerequisites: Faculty Web Page:

2321 Macro-Economics

Heliopolis University for Sustainable Development

- www.hu.edu.eg

2013/2014

Course Description/Overview

This course is designed to introduce students to the core concepts of Macro-Economics. Students learnt to view the economy in holistic terms and understand the impact of certain economic policies on growth, development, GDP, income inequality, etc... Throughout this course, students are exposed to the different ways that environmental damage impacts the economy as a whole, and internalize the way that all aspects of the economy are interconnected.

Course Learning Objectives

The overarching goals of this course are: a) to teach students about the concepts economy, GDP, and inflation b) raise awareness of the impacts of environmental and ecological harm on economic development, and c) Understand how this knowledge can be applied to real life situations and how it can impact the economic prosperity of a country.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

40. Discuss the underlying theories regarding Macro-Economics

41. Understand the different concepts of Macro-Economics and their underlying foundations

42. Understand how to calculate GDP, GNP, inflation, and other economic indicators

43. Realize how economic indicators impact the way governments and organizations act and react to the different environmental factors

44. To be able to calculate and see the negative impact of climate change in Macro- Economic terms

45. To be able to understand that environmental harm impacts the economic prosperity of a country, even if GDP is increased in the short term

Course Resources

Course Website(s) Required Course Texts and Materials Hands-out prepared by the instructor for the class Optional Course Texts and Materials

Grading Policy

Grades can be based on the following:

Assignments	10%
Quizzes	10%
Final Exam	40%
Mid-Term Exam	30%
Class participation	20%
Total Points	100 %

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Any submission that is less than a week late will get only half the marks; more than a week late and it will not be accepted

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by- case basis. Important Dates to Remember

Course Schedule

Week	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)

1	Course Overview Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	Introduction to macro-economics, why we study macro-economics
3	How macro-economics differs from other fields of economics, what can be gained practically by studying it
4	Inflation & Deflation, its causes, its impact and why economic policies target inflation specifically
5	The economies of the environment, why is it not calculated in current economic indicators, alternatives to calculate it
6	GDP, GNP, what they measure, how they measure it and what their importance is

7	Economic growth vs Economic Development, which is more important? Which sho be focused on?
8	Climate change and how it is changing modern economic thought
9	The economics of the cap and trade system.
10	Other macro-economic theories and indicators

11	The different economic policies of different countries. How these policies are chosen and made
12	The impact of politics on Macro-Economics policies;
13	Presentation of projects

CLIMASP COURSE SYLLABUS TEMPLATE Course Syllabus

Course Number: 2472

Natural Resources Planning

Heliopolis University for Sustainable Development, Faculty of Business and Economics, Department of Enterprise,

Instructor Information

Instructor: Office Location: Telephone: Office Hours: E-mail: Website:

Mr. Omar Eldahan Department of Enterprise, Faculty of Business and Economics

omar.eldahan@hu.edu.eg www.hu.edu.eg

Course Identification

Course Number: Course Name: Course Location: Class Times: Prerequisites: Faculty Web Page:

2472 Natural Resources Planning Heliopolis University for Sustainable Development

2411 Integral Management www.hu.edu.eg

2013/2014

Course Description/Overview

This course is designed to teach students about the way natural resources are planned and managed in a practical context. Students are taught the methods used both on a micro and a macro level. The course teaches methods of calculating the present and future value of natural resources and the way that the conservation of said resources are calculated. Furthermore, students are taught about adding in the calculation of CO2 from fossil fuels and other carbon emitting resources in order to consider for the cost to the environment, the economy, and for cap-and-trade rules and regulations.

Course Learning Objectives

The overarching goals of this course are: a) to teach students about the concepts of how natural resources are calculated financially b) for the students realize the important of conserving natural resource, and c) for the

students to understand how calculations are made by world governments to make strategic decisions about discovering and consuming their natural resources.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

46. Discuss the underlying theories regarding the planning and valuing natural resources

47. Understand the different concepts of conserving natural resources and their pragmatic, financial imperative

48. Realize the importance of conserving natural resources

49. Realize how to calculate the overall cost of extracting and consuming finite natural resources

50. To be able to explain the cap-and-trade process and how it fits into a company’s and country’s method of calculating the cost effectiveness of extracting the resources

51. To be able to understand the environmental impact, and the role of conserving natural resources plays in mitigating and facing climate change

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Grading Policy

Grades can be based on the following:

Assignments	10%
Quizzes	10%
Final Exam	40%
Mid-Term Exam	30%
Class participation	20%

Total Points	100 %

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Any submission that is less than a week late will get only half the marks; more than a week late and it will not be accepted

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by- case basis. Important Dates to Remember

Course Schedule

Week	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	Course Overview Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	Introduction to resource planning and management
3	The different methods and calculations used for calculating the monetary value of natural resources
4	Calculating the future vs present value of natural resources
5	The impact of these calculations on governmental actions and on corporate decisions regarding natural resources
6	How conserving natural resources can be a way to prevent global warning

7	Sustainable development and its relationship with natural resources and its planning
8	Natural resources that contribute to global warming, and how this must been taken into account. Adding

	carbon footprints to the total cost of materials
9	Modern statistical techniques for measuring both the future and present cots of consuming natural resources as well as accounting for their carbon footprint
10	Programs designed for the planning, organizing and measuring of resource consumption
11	Alternatives to consuming natural resources, and sustainable alternatives towards new consumption
12	Recycling, reusing, reorienting, reforming, and recreating resources for a more sustainable future
13	Presentation of projects

CLIMAPS COURSE SYLLABUS TEMPLATE Pharmacognosy I

Course Number: PHG111 Heliopolis University, Faculty of Pharmacy and Drug Technology, Department of Pharmacognosy and Medicinal Plants Fall Semester, 2013-2014

Instructor Information

Instructor: Office Location: Telephone: Office Hours: E-mail: Website:

Associate Prof. Dr. Amira Abdel Motaal Pharmacy Building Office (+20) 02 265 64 140 extension 119
Tuesday 11.30- 13.30, Wednsday 14.00 – 16.00

amira.abdelmotaal@hu.edu.eg www.hu.edu.eg

Course Identification

Course Number: Course Name:

PHG 111

Pharmacognosy I

Course Location: Class Times: Prerequisites: Faculty Web Page: Course Description/Overview

University Campus Wednesday 8:30 – 11:30 - www.hu.edu.eg

The course covers the medicinal leaves, flowers, barks, woods and their derived drugs: classification, morphology, histology, monographs, powdered drug identification, adulteration, chemical tests, active constituents, uses, and pharmaceutical preparations of leaves e.g. senna, belladonna, digitalis, and henna; flowers e.g. clove, pyrethrum, chamomile, and calendula; barks and woods e.g. cinchona, cinnamon, cassia, and pomegranate. Quassia, guaiacum, yellow sandal, and pine wood.

1

Course Learning Objectives

After completion of the course the student should have the knowledge and skills that enable her/ him to recognize and identify leave, flower, bark, and wood drugs in entire and powdered forms. They also should recognize the medicinal value of these drugs and their importance for a sustainable health and recognize, explain and connect the basic principles, concepts, theories, pertaining to the global climate change debate using appropriate scientific language.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

a- KnowledgeandUnderstanding:

a_1- recognize different key elements of leaves, flowers, barks, and wood. a_2- demonstrate the morphological and histological characters of drugs composed of leaves, flowers, barks, woods, and seeds their active constituents, medicinal uses, and chemical tests.

a_3- explain concepts of quality control of herbal drugs. b- IntellectualSkills

b_1- differentiate between genuine and adulterated drugs made of leaves, flowers, wood or bark. b2- transfer intellectual knowledge into practical application by identifying a real unknown powder plant at the lab.

b3- plan and conduct a research task. c- ProfessionalandPracticalSkills

c_1- be able to use microscope and chemical tests to identify drugs of leaves, flowers, bark and wood origin c_2- describe different morphological and histological features of leaves, flowers, bark, and wood either in entire or powder form.

d- General and Transferable Skills

d1- independent learning; d2- team working; d3- presentation skills; d4- basic IT literacy.

Course Resources

Course Website(s) Required Course Texts and Materials Hands-out prepared by the instructor are uploaded on the portal for the students.

2

1- Trease & Evans' Pharmacognosy,latestedition.

2- Anintroductiontoplantbiology.

3- Fundamentals of pharmacognosy and phytotherapy.

4- Encyclopaediaofherbsandtheiruses.

5- Thecompleteguidetoherbalmedicine.

6- Thehealingpowerofherbs.

7- TheABCclinicalguidetoherbs.

8- BritishandEgyptianPharmacopeia.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

GPA from 1 to 4 (where 2 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a practical course, which means that students are expected to come to ALL classes and laboratories. You cannot pass the class under any circumstances if you miss more than three classes or three labs. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Assignments	10%

Written exams	35%
Class attendance/participation	20%
Oral exams	10%
Practical exam	25%
Total Points	100

3

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis. Important Dates to Remember

Course Schedule

Week	Date	Lectures	Practical	Dates
1	30.09.2013	Introduction, definitions, factors affecting plant growth	Introduction, dusting powders	03.10.2013
2	09.10.2013	Introduction, from plant to product, secondary metabolites	Dusting powders continue	10.10.2013
3	15.10.2013	Introduction to leaf	Ca-oxalate crystals	16, 17.10.2013
4	22.10.2013	Senna, Solanaceous leaves (1 hour)	Morphology leaves	23,24.10.2013
5	29.10.2013	Other leaves	Students Presentations	30,31.10.2013
6	05.11.2013	Introduction of barks	Hairs	6,7.11.2013
7	12.11.2013	bark	Surface preparation leaves, Leaves powder unknowns	13,14.11.2013

8	19.11.2013	Bark	barks	20,21.11.2013
9	26.11.2013	Mid-term exam	Mid-term exam	27,28.11.2013
10	03.12.2013	Bark, wood	Wood, T.S. in leaf	4,5.12.2013
11	10.12.2013	Introduction of flower	flowers	11,12.12.2013

4

12	17.12.2013	flower	Revision, spots & mixtures, Quiz	18,19.12.2013
13	23.12.2013	Revision	Revision	24,25.12.2013
14	01.01.2014	Revision	Exam	2,3.01.2014

5

CLIMAPS COURSE SYLLABUS TEMPLATE Pharmacognosy II

Course Number: PHG121 Heliopolis University, Faculty of Pharmacy and Drug Technology, Department of Pharmacognosy and Medicinal Plants Spring Semester, 2013-2014

Instructor Information

Instructor: Office Location: Telephone: Office Hours: E-mail: Website:

Associate Prof. Dr. Amira Abdel Motaal Pharmacy Building Office (+20) 02 265 64 140 extension 119 Sunday 11.30- 13.30, Thursday 14.00 – 16.00

amira.abdelmotaal@hu.edu.eg www.hu.edu.eg

Course Identification

PHG 121

Course Number: Course Name: Course Location: Class Times: Prerequisites: Faculty Web Page: Course Description/Overview

The course covers the medicinal seeds, fruits, herbs, subterranean organs, and their derived drugs:

classification, morphology, histology, monographs, powdered drug identification, adulteration, chemical tests, active constituents, uses, and pharmaceutical preparations of seeds e.g. cardamom, nigella, fenugreek, and psylium; fruit e.g. anise, Ammi visnaga, capsicum, and cratagus; herbs e.g. mentha, thyme, lobelia, and ergot; subterranean organs e.g. squill, rhubarb, ginger, and liquorice.

Pharmacognosy II

University Campus Wednesday 12:30 – 14:30 - www.hu.edu.eg

1

Course Learning Objectives

• After completion of the course the student should have the knowledge and skills that enable her/ him to recognize and identify fruits, herbs, subterranean organs, in entire and powdered forms. They also should recognize the principles of quality control of these drugs, and their value in maintaining a sustainable health system, develop appropriate problem solving and service learning strategies for climate change adaptation and mitigation.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

a- KnowledgeandUnderstanding:

a_1- recognise different key elements of fruits, herbs, subterranean organs a_2- demonstrate the morphological and histological characters of drugs composed of fruits, herbs, subterranean organs, their active constituents, medicinal uses, and chemical tests.

a_3- explain concepts of quality control of herbal drugs including contamination.

b- Intellectual Skills

b_1- differentiate between genuine and adulterated drugs made of fruits, herbs, subterranean organs. b2- transfer intellectual knowledge into practical application by identifying a real unknown powder plant at the lab.

b3- plan and conduct a research task. c- ProfessionalandPracticalSkills

c_1- be able to use microscope and chemical tests to identify drugs of fruits, herbs, subterranean organs c_2- describe different morphological and histological features of fruits, herbs, subterranean organs, either in entire or powder form.

d- General and Transferable Skills

d1- independent learning; d2- team working; d3- presentation skills; d4- basic IT literacy.

2

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor are uploaded on the portal for the students.

60. 1- Trease&Evans'Pharmacognosy,latestedition.
61. 2- Anintroductiontoplantbiology.
62. 3- Fundamentals of pharmacognosy and phytotherapy.
63. 4- Encyclopaediaofherbsandtheiruses.
64. 5- Thecompleteguidetoherbalmedicine.
65. 6- Thehealingpowerofherbs.
66. 7- TheABCclinicalguidetoherbs.
67. 8- BritishandEgyptianPharmacopeia.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

GPA from 1 to 4 (where 2 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a practical course, which means that students are expected to come to ALL classes and laboratories. You cannot pass the class under any circumstances if you miss more than three classes or three labs. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who

Assignments	10%
Written exams	35%
Class attendance/participation	20%
Oral exams	10%
Practical exam	25%
Total Points	100

3

violate these minimal expectations as absent. You are expected to assigned material before you come participation, which counts for 20% of the grade.

Dissability

will be asked to leave and counted have read and thought about the to class. I expect active class

Students who have disabilities should have a confidential appointment to discuss their need for accommodations.

Establishing reasonable accommodations should be considered on a case-by- case basis.

Course Schedule

4

Week

Date

Lectures

Practical

Dates

1

Wed.13.02.2014

Introduction to seeds

2

20.02.2014

Linseed, Foenugreek, Black mustard, White mustard

Introduction

Sun 17.02.2014 Thurs21.02.2014

3

27.02.2014

Cardamom, Psyllium, Nutmeg, Nux vomica,Colchicum, Strophanthus

Linseed

24.02.2014 28.02.1014

4

06.03.2014

Non-official seeds

Foenugreek

03.03.2014 07.03.2014

5

13.03.2014

Introduction to Fruit

Nux vomica

10.03.2014 14.03.2014

6

20.03.2014

Umbelliferous fruit (Fennel, anise, coriander

17.03.2014

21.03.201

4

7

27.03.2014

Ammi visnaga, Ammi majus

Mentha, thyme, cannabis,

Introd. Fruit, Anise

24.03.2014 28.03.2014

8

03.04.2014

Mid-term Exams

31.03.2014 04.04.2014

9

10.04.2014

Silybium marianum, capsicum, colocynth, Introduction to Herbs

Fennel

07,11.04.2014

10

17.04.2014

Passiflora, Hypericum

Coriander, anise

14,18.04.2014

11

24.04.2014

Ammi visnaga, Ammi majus

21 .04.2014

, 25

12

01.05.2014

Day off

Capsicum

27.04.2014 02.05.2014

13

08.05.2014

Introduction to subterranean organs

Thyme, Mentha

05, 09.05.2014

14

15.05.2014

Liquorice, ginger, rhubarb

Revision

12,16.05.2014

15

22.05.2014

Revision

Practical Exam

19,23.05.2014

CLIMAPS COURSE SYLLABUS TEMPLATE Phytochemistry I

Course Number: PHG221 Heliopolis University, Faculty of Pharmacy and Drug Technology, Department of Pharmacognosy and Medicinal Plants Spring Semester, 2013-2014

Instructor Information

Instructor: Office Location: Telephone: Office Hours: E-mail: Website:

Associate Prof. Dr. Amira Abdel Motaal Pharmacy Building Office (+20) 02 265 64 140 extension 119 Tuesday 11.30- 13.30, Wednsday 14.00 – 16.00

amira.abdelmotaal@hu.edu.eg www.hu.edu.eg

Course Identification

Course Number: Course Name:

PHG 221

Phytochemistry I

Course Location: Class Times: Prerequisites: Faculty Web Page: Course Description/Overview

University Campus Monday 8:30 – 12:30 - www.hu.edu.eg

The course describes the fundamentals of phytochemistry and plant constituents: extraction, isolation, characterization and quantitative evaluation of plant constituents, applications of chromatography and spectroscopy in the analysis of natural products. Volatile oils: physical properties, methods of preparation, storage, quality control, and chemistry. Carbohydrates: monosaccharides, disaccharides, trisaccharides, tetrasaccharides, homopolysaccharides, heteropolysaccharides, biologically active carbohydrates, and sweeteners. Resins: resin combinations and other isoprenoids.

1

Course Learning Objectives

After completion of the course the student should have the knowledge and skills that enables her/ him to understand, describe and deal with the chemistry of volatile oil, resins, miscellaneous terpenoids, bitters and carbohydrates of the plant or animal origin and its related techniques. Also, the student should be aware with different chromatographic methods used for isolation and analysis of different plant constituents. They also should recognize the medicinal value of these compounds and their importance for a

sustainable health and recognize, explain and connect the basic principles, concepts, theories, pertaining to the global climate change debate using appropriate scientific language.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

a- KnowledgeandUnderstanding: a_1- Define the biogenetic origin of secondary metabolites.

a_2-List the different classes of biologically active compounds of natural origin and their distribution in nature.

a_3-Define the general methods of extraction, separation, purification, identification and analysis of active constituents of medicinal plants by different chromatographic methods.

a_4-Describe the chemical structure, physico-chemical properties, isolation, identification and therapeutic uses of volatile oils, resins, miscellaneous isoprenoids, bitters and carbohydrates.

b- IntellectualSkills b_1- Categorize the different types of secondary metabolites

b_2-Apply the basic methods for extraction, isolation, purification and identification of natural compounds.

b_3-Analyze natural compounds qualitatively and quantitatively. b_4-Distinguish the basic laboratory equipments safely and efficiently.

b_5-Integrate and link information across course components, including structure, chemical identification and separation of certain chemical groups of plant' constituents.

b_6-Formulate pharmaceutical science material and arguments clearly and correctly, in writing and orally to both specialist and lay audiences.

2

c- Professional and Practical Skills c_1- Design suitable methods for extraction and isolation of different

compounds. c_2- Construct analytical methods, principles, design, development, validation and application of good laboratory practice. c_3- Diagnose structural changes that modify the biological activity. c_4- Interpret purposively data derived from laboratory observations and measurements in terms of their significance and theory underlying them. c_5- Collect the therapeutic uses of medicines including adverse reactions, interaction of medicine and their significance in treatment.

General and Transferable Skills d_1- Assess critical thinking.

d_2- Estinate problem solving. d_3- Integraton different fields of knowledge. d_4- Approve raise team work. d_5- Design independent learning.

Course Resources Course Website(s) Required Course Texts and Materials Hands-out prepared by the instructor are uploaded on the portal for the students.

68. 1- MedicinalPlantConstituents2nded.,Balbaaetal.,1978.

69. 2- MedicinalNaturalproducts,ABiosyntheticApproach2nded.,Dewick,2000.

70. 3- Bioactive Volatile Compounds from Plants.

71. 4- Encyclopaediaofherbsandtheiruses.

72. 5- Thecompleteguidetoherbalmedicine.

73. 6- Thehealingpowerofherbs..

74. 7- BritishandEgyptianPharmacopeia.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

GPA from 1 to 4 (where 2 is the least pass mark)

3

Grading Policy

Grades can be based on the following: (Example)

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a practical course, which means that students are expected to come to ALL classes and laboratories. You cannot pass the class under any circumstances if you miss more than three classes or three labs. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by- case basis. Important Dates to Remember

Assignments	10%
Written exams	35%
Class attendance/participation	20%
Oral exams	10%
Practical exam	25%
Total Points	100

4

3/3

Course Schedule

introduction I

Volatile oil

24/2

Volatile oil introduction II

Carbohydrates introduction-

Monosaccharides carbohydrates

Practical Phytochemistry 1

Date/2014

Phytochemistry 1

Introduction – preparation of oil

sDaemteprlmeibnyatdioisntiollfation Phenols in Volatile

10/3

Hydrocarbons in volatile oils

oil Determination of

Oxides in Volatile oil

Alcohols in volatile oils- Esters

17/3

Phenols in volatile oils - Oxides-peroxides in volatile oils.

Carbohydrates: mono and disaccharide

24/3

Polysaccharides+ Scheme+ Unknown

31/3

7/4

Oligosaccharides - Homopolysaccharides	Students Presentations

14/4

21/4

Heteropolysaccharides, Biologically active carbohydrates and

28/4

Chromatography: CC - TLC

5/5

Sweeteners Chromatography I

Revision

12/5

19/5

Chromatography II

Practical exams

Revision

5

CLIMAPS COURSE SYLLABUS TEMPLATE Phytochemistry II

Course Number: PHG311 Heliopolis University, Faculty of Pharmacy and Drug Technology, Department of Pharmacognosy and Medicinal Plants Fall Semester, 2014-2015

Instructor Information

Instructor: Office Location: Telephone: Office Hours: E-mail: Website:

Associate Prof. Dr. Amira Abdel Motaal Pharmacy Building Office (+20) 02 265 64 140 extension 119
Tuesday 11.30- 13.30, Wednsday 14.00 – 16.00

amira.abdelmotaal@hu.edu.eg www.hu.edu.eg

Course Identification

PHG 311

Course Number: Course Name: Course Location: Class Times: Prerequisites: Faculty Web Page: Course Description/Overview

The course covers plant secondary metabolites: alkaloids; isolation, characterization and quantitative

evaluation of different types of alkaloids (pyridine, quinoline and isoquinoline, indole, carboline, imidazole, purine) and phenolic compounds; simple flavonoids, polyphenols, tannins, anthranoids, miscellaneous secondary compounds, and finally, basic understanding of the role of natural products in drug discovery.

Phytochemistry II

University Campus Monday 8:30 – 12:30 - www.hu.edu.eg

1

Course Learning Objectives

After completion of the course the student should have the knowledge and skills that enables her/ him to understand, describe and deal with the chemistry of alakloids and phenolic compounds of the plant or animal origin and its related techniques. They also should recognize the medicinal value of these compounds and their importance for a sustainable health and recognize, explain and connect the basic principles, concepts, theories, pertaining to the global climate change debate using appropriate scientific language.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

a- KnowledgeandUnderstanding: a_1- Define the biogenetic origin of secondary metabolites.

a_2-List the different classes of biologically active compounds of natural origin and their distribution in nature.

a_3-Define the general methods of extraction, separation, purification, identification and analysis of active constituents of medicinal plants.

a_4-Describe the chemical structure, physico-chemical properties, isolation, identification and therapeutic uses of alkaloids and phenolic compounds.

b- IntellectualSkills b_1- Categorize the different types of secondary metabolites

b_2-Apply the basic methods for extraction, isolation, purification and identification of natural compounds.

b_3-Analyze natural compounds qualitatively and quantitatively. b_4-Distinguish the basic laboratory equipments safely and efficiently.

b_5-Integrate and link information across course components, including structure, chemical identification and separation of certain chemical groups of plant' constituents.

b_6-Formulate pharmaceutical science material and arguments clearly and correctly, in writing and orally to both specialist and lay audiences.

c- ProfessionalandPracticalSkills

2

c_1- Design suitable methods for extraction and isolation of different

compounds. c_2- Construct analytical methods, principles, design, development, validation and application of good laboratory practice. c_3- Diagnose structural changes that modify the biological activity. c_4- Interpret purposively data derived from laboratory observations and measurements in terms of their significance and theory underlying them. c_5- Collect the therapeutic uses of medicines including adverse reactions, interaction of medicine and their significance in treatment.

General and Transferable Skills d_1- Assess critical thinking.

d_2- Estinate problem solving. d_3- Integraton different fields of knowledge. d_4- Approve raise team work. d_5- Design independent learning.

Course Resources Course Website(s) Required Course Texts and Materials Hands-out prepared by the instructor are uploaded on the portal for the students.

75. 1- MedicinalPlantConstituents2nded.,Balbaaetal.,1978.

76. 2- MedicinalNaturalproducts,ABiosyntheticApproach2nded.,Dewick,2000.

77. 3- Bioactive Volatile Compounds from Plants.

78. 4- Encyclopaediaofherbsandtheiruses.

79. 5- Thecompleteguidetoherbalmedicine.

80. 6- Thehealingpowerofherbs..

81. 7- BritishandEgyptianPharmacopeia.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

GPA from 1 to 4 (where 2 is the least pass mark)

3

Grading Policy

Grades can be based on the following: (Example)

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a practical course, which means that students are expected to come to ALL classes and laboratories. You cannot pass the class under any circumstances if you miss more than three classes or three labs. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by- case basis.

Assignments	10%
Written exams	35%

Class attendance/participation	20%
Oral exams	10%
Practical exam	25%
Total Points	100

4

Course Content

Theoretical	Estimated number of hours
Alkaloids	11
Glycosides	9
Tannins	2

Basic understanding of the role of natural products in drug discovery	2
Total	24

5

CLIMAPS COURSE SYLLABUS TEMPLATE

Renewable Energy project Course Number: F11REP221 Heliopolis University, Faculty of Engineering ,

Department of Energy Fall Semester, 2014-2015

Instructor Information

Instructor: Dr. Heba Mosalam Office Location: Engineering Building Telephone: Office (+20) 02 265 64 140 extension 380 Office Hours: Sunday till Thursday from 8.00am to 4.00 pm E-mail: heba.mosalam@hu.edu.eg Website: www.hu.edu.eg

Course Identification

Course Number: Course Name:

Course Location: Class Times: Prerequisites: Faculty Web Page:

F11REP221

Renewable Energy Project

University Campus

USUS121 “Sustainable development and Environment” www.hu.edu.eg

Course Description/Overview

82. • Climate change is likely to both increase electricity demand for cooling in the summer and decrease electricity, natural gas, heating oil, and wood demand for heating in the winter. New infrastructure investments may be necessary to meet increased energy demand, especially peak demand during heat waves.

83. • Climate change could affect the amount of water available to produce electricity or extract fuel. In areas where water is already scarce, competition for water between energy production

and other uses could increase.

84. • □Sea level rise and more frequent intense storms could disrupt energy production and delivery by damaging electricity infrastructure, fuel delivery infrastructure and equipment, power plants, or storage facilities. Course Learning Objectives: The role of the renewable materials is very important to human beings especially to wind, tides and geothermal heat, which are naturally replenished. Non-renewable sources of energy, like coal, oil and natural gas, emit carbon dioxide, a

climate change because, renewable energy	utilizes natural resources such as sunlight,

greenhouse gas that is contributing to climate change. This is why we need to move to renewable sources.

Renewable energy technologies range from solar power, wind power, and hydroelectricity to biomass and biofuels for transportation.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

• Knowledge and Understanding: By the end of this course, the student should be able to:

1- Grasp the awareness of sustainable development.

2- About 13 percent of primary energy comes from renewables, with most of this coming from traditional biomass like wood-burning. Hydropower is the next largest source, providing 2-3%, and modern technologies like geothermal, wind, solar, and marine energy together produce less than 1% of total world energy demand. The technical potential for their use is very large, exceeding all other readily available sources.

3- Define the technology used in solar systems.

• Intellectual Skills 1- Energy use from fossil fuel is the dominant source of greenhouse gas emissions

2- If the production of all our energy from renewable sources tomorrow we would have very little problem with climate change.

3- the actual capacity of producing renewable energy in Egypt. 4- Human activities are the main reason for the global warming.

• Professional and Practical Skills By the end of this course, the student should be able to:

1- Suggest a solar energy system for specific application. 2- Estimate the cost of solar system application. 3- Simulate different types of solar systems. 4- Capability to estimate the cost of applying renewable energy for small community. 5- Well understand the meaning of hybrid systems for different kinds of renewable energies. 6- Capability of making project auditing and energy efficiency control.

• General and Transferable Skills 1- Working within a team work

2- Designing technical presentation 3- Writing a full technical report.

Course Resources

Renewable Energy Sources and Climate Change Mitigation, summary for policymakers and technical summary. Published for the Intergovernmental Panel on Climate Change,2011

Course Website(s)

http://www.answers.com/Q/What_is_the_role_of_renewable_energy_in_addressing_climate_ change

Required Course Texts and Materials

Hands-out prepared by the instructor are uploaded on the portal for the students. 1- Engineering solution for energy crisis in Egypt. 2- Regional Center for Renewable Energy and Energy Efficiency Newsletters. 3- Energy management in Egypt.

4- Egyptian Governmental tariff for renewable energy producers. 5- How to convert your traditional source of energy to renewable one.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

GPA from 1 to 4 (where 2 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	10%
Written exams	35%
Class attendance/participation	20%
Oral exams	10%
Practical exam	25%
Total Points	100

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a practical course, which means that students are expected to come to ALL classes and tutorials and Laboratories. You cannot pass the class under any circumstances if you miss more than three classes or three labs. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by- case basis.

Important Dates to Remember Course Schedule

Week	Date	Lectures
1	30.09.2014	Introduction to the sources of power
2	09.10.2014	Introduction to the traditional source of power
3	15.10.2014	How the traditional station works and its theories
4	22.10.2014	Source of renewable energy, technologies and markets
5	29.10.2014	Introduction to the Solar energy in Egypt
6	05.11.2014	How to convert your house to work with PV
7	12.11.2014	Different applications for the solar power
8	19.11.2014	Bioenergy source of renewable energy
9	26.11.2014	Geothermal source of Energy

10	03.12.2014	Hydropower and Ocean energy
11	10.12.2014	Wind Energy in Egypt.
12	17.12.2014	Renewable Energy in the Context of Sustainable Development
13	23.12.2014	Mitigation potentials and costs
14	01.01.2015	Presentation for course project.

Course Teaching and Learning Methods:

1- All lectures are in electronic format using data show. 2- Tutorials are often in the form of example problems which are solved by students with the help of staff. 3- Labs and/or case study for more demonstration.

Course	Business Ethics
Module 1	The sources of renewable energy

Key Concepts	The foundations, history and origins of ethics
Overview	There are multiple options for lowering GHG emissions from the energy system while still satisfying the global demand for energy services. Some of these possible options, such as energy conservation and efficiency, fossil fuel switching, RE, nuclear and carbon capture and storage (CCS) were assessed in the AR4. A comprehensive evaluation of any portfolio of mitigation options would involve an evaluation of their respective mitigation potential as well as their contribution to sustainable development and all associated risks and costs.
Aim	The aims of this course is to allow the students to think about the different sources of renewable energy could use in our culture. Understand the meaning of Egypt Atlas for wind and solar. Read in solar application and how to implement in real case.
Learning outcomes	At the end of this module learners will be able to: • • □Demand for energy and associated services, to meet social and economic development and improve human welfare and health, is increase. • • □Greenhouse gas emissions resulting from the traditional energy sources have contribute significantly to the historic increase in atmospheric GHG concentrations.
Units	1.1: What are the sources of energy? 1.2: how the traditional power station contribute in the GHG. 1.2: sources of renewable energy. 2.1: Solar thermal and electricity applications 2.2: fundamental for solar applications

	2.3 wind energy.
Reading	Renewable Energy Sources and Climate Change Mitigation, summary for policymakers and technical summary. Published for the Intergovernmental Panel on Climate Change,2011
Activity	Students projects for small solar applications.
Module 2	RetScreen Energy Efficiency Software.
Key Concepts	Clean Energy Project Analysis
Overview	Clean Energy Project Analysis: ReScreen Engineering and Cases: is an electronic textbook for professionals and university students. This chapter covers the analysis of potential photovoltaic projects using the RETScreen® International Clean Energy Project Analysis Software, including a technology background and a detailed description of the algorithms found in the RETScreen® Software. Many case studies are available on their website.
Aim	Significant growth in demand for PV systems is expected to occur in developing countries to help meet the basic electrical needs of the 2 billion people without access to conventional electricity grids. In addition to this demand for cost effective off-grid power systems, environmental and longer-term fuel supply concerns by governments and electric utilities are beginning to help accelerate the market for demonstration programs for PV systems connected to central electric grids in industrialized countries.

Learning outcomes	At the end of this module learners will be able to: • • □Read the similar case studies relative to our culture. • • □Know how to collect the data and use international inventory.
Units	3.1: Basic of Solar Energy 3.2: Tilted Irradiance Calculation 3.3:PV Array Model 4.1: On and Off Grid Model

	4.2: Water Pumping Model.
Reading	RetScreen Official Website: http://www.retscreen.net/ang/d_t_info.php
Activity	Use Egyptain data to apply one of the case studies.

Course Syllabus Self-Sufficiency Economics

Instructor Information

Instructor: Office Location: Telephone: Office Hours: E-mail: Website:

Maximilian Abouleish ... ... maximilian.abouleish@hu.edu.eg

Course Identification

Course Number: Course Name: Course Location: Class Times: Prerequisites: Faculty Web Page:

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2205 Self-Sufficiency Economics ... ... Introduction to Integral Economics (2233) ...

Description/Overview

Participants of this course Economic Commons and basis for the subsequent course Self-Sufficiency Economics II. This parts of the Southern Economic Path of Self-Sufficiency Economics is concerned with (1) the extent our economy is grounded in its particular nature and community, and (2) the way our local economic communities are lodged in diversity, naturally and culturally.

Course Learning Objectives

85. To provide a basic grounding in the economics of self-sufficiency, in theory and practice

86. To compare and contrast efficiency with sufficiency

87. To appreciate the basic nature and scope of subsistence economics Course Content Learning Outcomes Upon successful completion of this course, students will be able to:

- To be able to identify the grounds for self-sufficiency in the local community
- To distinguish between self-sufficiency and sustainable development
- To distinguish between the natural and communal elements of self sufficiency
- To position self-sufficiency within a conventional economic context Furthermore, students will gain the following transferable skills and other attributes:
- Gain acquire practical skills in becoming self-sufficient, together with others

- Become develop a sense of “sufficiency” in your lifestyle
- Stat to build a local economy from the ground up
- Internalize the connectedness between nature and community 2

Course

will get an overview on Grassroots Economics as a

Learning and teaching strategies

- Lectures/seminars/group exercises – on building a self sufficient micro-economy
- Drawing on the history and culture of your region to uncover subsistence economies
- Practical projects – to cast light on self sufficiency
- Oral, visual and written presentation – to illustrate the workings of the subsistence economy you have been building as a group Course Resources Course

Website(s) Required Course Texts and Materials

- Bennholdt-Thomsen, V. & Mies, M. (1999). The Subsistence Perspective: Beyond the Globalised Economy. London: Zed Books.

- Shiva, V. (2005). Earth Democracy: Justice, Sustainability and Peace. Cambridge: Southend.

- Polanyi, K. (2002). The Great Transformation: The Political and Economic Origins of Our Time. New York: Beacon Press.

- Lessem, R. & Schieffer, A. (2010). Integral Economics: Releasing the Economic Genius of your Society. Chapters 2, 5-8. Farnham: Gower-Ashgate.

- Yunus, M. (2008). Creating A World Without Poverty. New York: Public Affairs. Optional Course Texts and Materials Course Policies Grading System Assignments and Grading Scheme This course is assessed through course and fieldwork, as well as formal assessment, with a pre-emphasis on activity, enterprise and the achievement of results. 3

Grading Policy

Grades can be based on the following: (Example)

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify the professor before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you

come to class. I expect active class participation, which counts for 25% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

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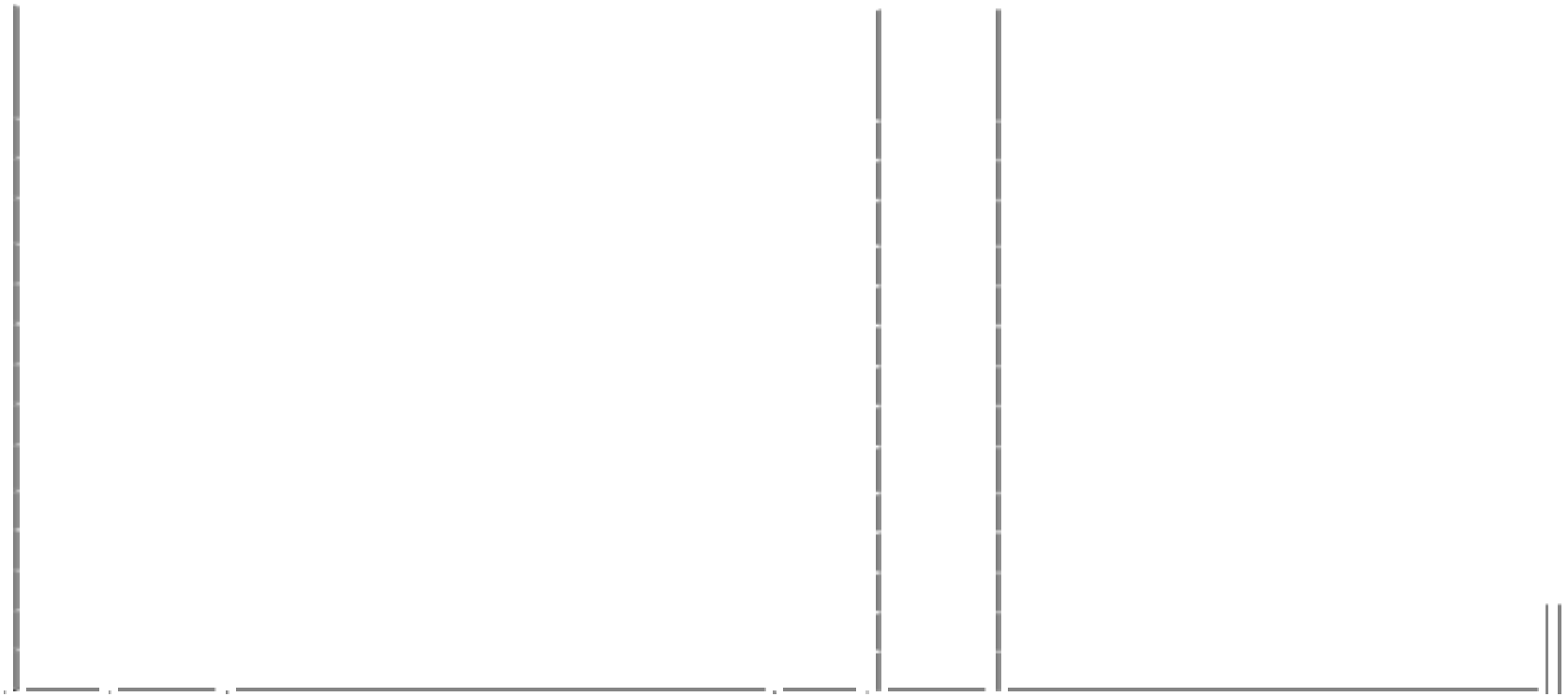
Assignments and/or Presentation	25%
Exams (Mid-term and Final)	50%
Class attendance/participation	25%
Total Points	100

Course Schedule



Week Date

1 2 3

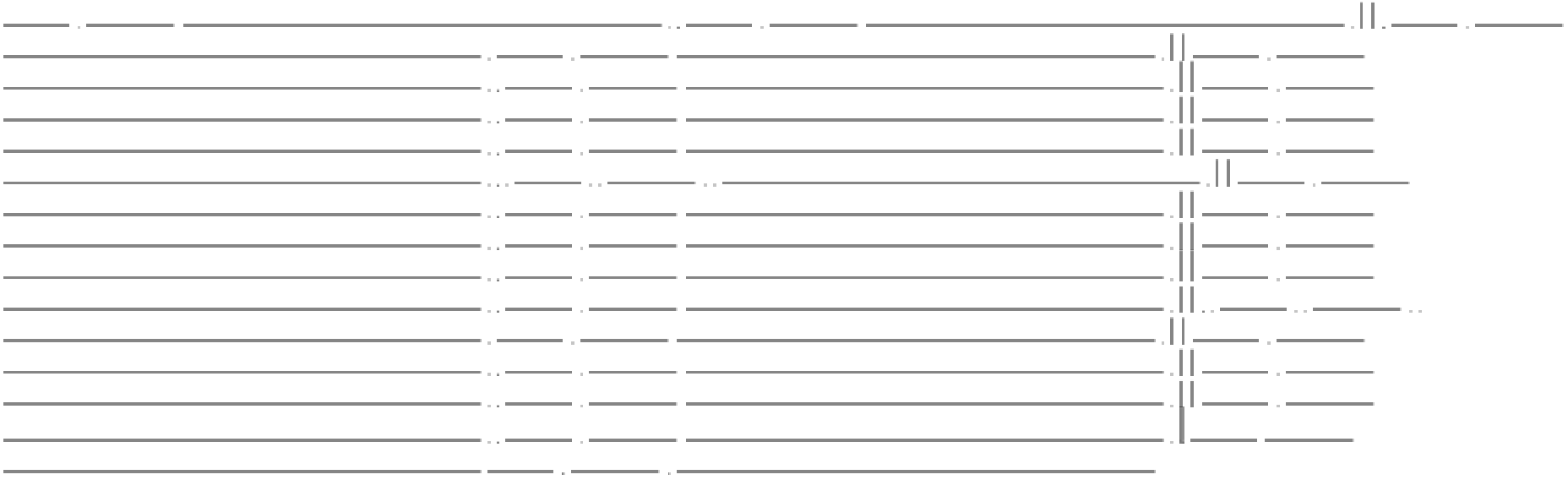
4 5 6 7 8 9

10 11 12 13 14-16

Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules) Introduction Module 1 Module 1 (continued)

Buffer Module 2 Module 2 (continued) Module 3 Module 3 (continued) Midterm Exam

Module 4 Module 4 (continued) Buffer/Repetition Exam Buffer



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APENDIX II: The CLIMASP Course Modules Template Example

Modules Overview

Course	Self-Sufficiency Economics
Module 1	The economics of the commons
Key Concepts	• Communal Call for Freedom • Overcoming the Subordination of our Lives under Value Practices of Capitalism • Lodged within the communal Commons as opposed to individual Preferences
Overview	With Massimo de Angelis we enter the southern world of 'nature and community' with a contemporary Italian political economist. De Angelis' work on The Beginning of History lodges economics in the commons. His communal call for freedom challenges us to overcome the subordination of our lives under the value practices of market capitalism. In the context of our Integral Economy, de Angelis' philosophy provides

	the theoretical basis for regrounding economics in community. Further, by reversing the neoclassical conception of the economy as independent from society, he builds on the 20th century economic anthropologist Karl Polanyi, who maintained that the economy is embedded in society. De Angelis's perspective is reinforced, at the end of the chapter, by a brief introduction to African Economic Humanism. The originator, Mfuniselwa Bhengu, a South African politician and social philosopher, lodges his equally communal economic approach in the African philosophy of Ubuntu: I am because you are.
Aim	...

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Learning Outcomes	•...
Units	Unit 1.1 ...

Readings	• Fukuyama, F. (1993). The End of the History and the Last Man. London: Harper Perennial. • De Angelis, M. (2007). The Beginning of History: Value Struggles and Global Capital. London: Pluto Press. • Polanyi, K. (2001). The Great Transformation. Boston: Beacon. • Bhengu, M. (2010). African Economic Humanism: The Rise of an African Economic Philosophy. Farnham: Gower. • Smith, A. (2009). The Theory of Moral Sentiments. Paris: Book Jungle.
Activity	Overview ...
	Assignment/Exam
Module 2	Grassroots economics and earth democracy
Key Concepts	• Renewed cultural Soil renews Economics

	• Provides philosophical and practical Insigths into an emergent multicultural local Movement • Challenges the global monocultural economic Establishment
Overview	Esteva's and Prakash's work on 'Grassroots Postmodernism' as well as Vandana Shiva's approach to Earth Democracy build on the philosophical grounds in which the Economic Commons is lodged. Together they provide accumulative insight into an emergent multicultural local so-called 'pluriverse', challenging the global monocultural economic establishment. By looking at economics from such a 'grassroots' perspective, we show not only how revisiting economics on a local level can lead to 'remaking the soil of cultures' (the subtitle of Esteva's and Prakash's book), they also particularly emphasize the importance of 'nature and community', now alongside cultural diversity in such an evolution. 'Nature and Community' is the southern reference point of an Integral

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	Economy, encompassing, most strongly, the economic principles of sustenance and

	self-sufficiency.
Aim	...
Learning Outcomes	•...
Units	Unit 1.1 ...
Readings	• □Esteva, G. & Prakash, M. (1999). Grassroots Post-Modernism: Remaking the Soil of Cultures. London: Zed Books. • □Prakash, M. & Esteva, G. (1998). Escaping Education: Living as Learning at the Grassroots. New York: Peter Lang Publishing. • □Shiva, V. (2005). Earth Democracy: Justice, Sustainability and Peace. Cambridge: South End Press. • □Swami Agnivesh (2003). Religion, Spirituality and Social Action: New

	Agenda for Humanity. Delhi: Hope India Publications. • Mani, R. (2002). Beyond Retribution. Seeking Justice in the Shadows of War. Cambridge: Polity Press. • Sahlins, M. D. (2003). Stone Age Economics. New York: Routledge Chapman & Hall.
Activity	Overview ...
	Assignment/Exam
Module 3	The nature and scope of subsistence economics
Key Concepts	• Economics in Harmony with Nature and Community • Priority of Use-Value-Production • Central Concern: Creation and Maintenance of communal Economy • Starting Point: Needs of Rural Woman from 'Global South'

Overview	With the work of Princen, Bennholdt-Thomsen and Mies, we continue to build up approaches whereby economies operate in harmony with nature and community. In doing so, we initially build on the work of Harvard educated Thomas Princen, transforming

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	efficiency into sufficiency. Thereafter we turn to German eco- feminists, Veronika Bennholdt-Thomsen and Maria Mies, whose applied research and practical experiences in Southeast Asia informed their theory on subsistence economics. The strong theory basis of subsistence economics makes it an ideal example for southern navigation, offering conceptual guidance in building a self-sufficient economy. Bennholdt-Thomsen and Mies have been inspired by the case of Grameen in Bangladesh, which will bring these 'southern' economic perspectives to practical life.
Aim	...

Learning Outcomes	•...
Units	Unit 1.1 ...
Readings	• □Princen, T. (2005). The Logic of Efficiency. Cambridge: MIT Press. • □Bennholdt-Thomsen, V. & Mies, M. (1999). The Subsistence Perspective: Beyond the Globalized Economy. London: Zed Books. • □Polanyi, K. (2001). The Great Transformation. Boston: Beacon Press.
Activity	Overview ...
	Assignment/Exam
Module 4	**Social business, self sufficiency and micro-finance**
Key Concepts	• □A World without Poverty: Poverty is not created by the Poor, but by the

	Socio- Economic Structures • Objective to create a level playing Field for Everybody; to give every Human Being a fair and equal Chance; to develop the Potential of everybody to the fullest
Overview	We are now turning to a prominent practical case for economic self-sufficiency, to Grameen in Bangladesh as a 'social business'. Altogether these serve to provide the grounding (commons), emergence (pluriverse/earth democracy), navigation (subsistence/sufficiency) and ultimate practical effect (social

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	business) arising out of the southern world of nature and community.
Aim	...
Learning Outcomes	•...

Units	Unit 1.1 ...
Readings	• Yunus, M. (1999). Banker for the Poor. New York: Aurum. • Yunus, M. (2008). Creating a World Without Poverty. New York: Public Affairs.
Activity	Overview ...
	Assignment/Exam

10

Instructor Information

Instructor: Office Location: Telephone: Office Hours: E-mail: Website:

Course Identification

Course Number: Course Name: Course Location: Class Times: Prerequisites: Faculty Web Page:

1

2207 Social Economics ... ... Introduction to Integral Economics (2233) ...

Course Syllabus Social Economics

Maximilian Abouleish ... ... maximilian.abouleish@hu.edu.eg

Course Description/Overview

Participants of this course will get an overview on Common Good Economics and Network Economy as a basis for the subsequent course Social Economics II. This parts of the Northern Economic Path of Social Economics is concerned with (1) the extent our society's economy is designed to bring about humane communities and enterprises, and (2) to what extent our society is open for learning, responding to the economic opportunities but also to the social challenges posed by a network society.

Course Learning Objectives

88. To provide a critique of market based economic from a social economic perspective

89. To position the emerging knowledge economy in a social context

90. To understand the nature and scope of co-operative enterprise Course Content Learning Outcomes Upon successful completion of this course, students will be able to:

- To be able to align culture with economics
- To distinguish between a local-global developmental, and a self- sufficient, local economy
- To be able to internalize development, individually and societally, psychologically and economically
- To position a developmental economy within a conventional economic context

Furthermore, students will gain the following transferable skills and other attributes:

- Internalize developmental principles and processes
- Build a knowledge-creating approach into your work and study processes

- Be able to link a social orientation to a knowledge-based economy and enterprise 2

- Internalize the connectedness between nature, culture and knowledge work
- Internalize the connectedness between nature and culture Learning and teaching strategies

- Lectures/seminars/group exercises – on building up social-and- knowledge processes
- Drawing on the Islamic orientation toward knowledge, generally, and in information and communication technologies, specifically, to build up a knowledge based community
- Practical projects focused on social processes for knowledge creation
- Oral, visual and written presentation focused explicitly on the use of knowledge, in groups,

to build up mini knowledge based, social economies Course Resources Course Website(s) Required Course Texts and Materials

Lutz, M. (1995). Economics for the Common Good. London: Routledge.

Large, M. (2000). Open Society. New York: Little Brown.

Lessem, R. & Schieffer, A. (2010). Integral Economics: Releasing the Economic Genius of your Society. Chapters 2, 13-16. Farnham: Gower-Ashgate.

Whyte, W. & K. (1991). The Making of Mondragon. Ithaca: Cornell University Press.

Optional Course Texts and Materials Course Policies Grading System Assignments and Grading Scheme This course is assessed through course and fieldwork, as well as formal assessment, with a pre-emphasis on activity, enterprise and the achievement of results. 3

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obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 25% of the grade.

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Exams (Mid-term and Final)	50%
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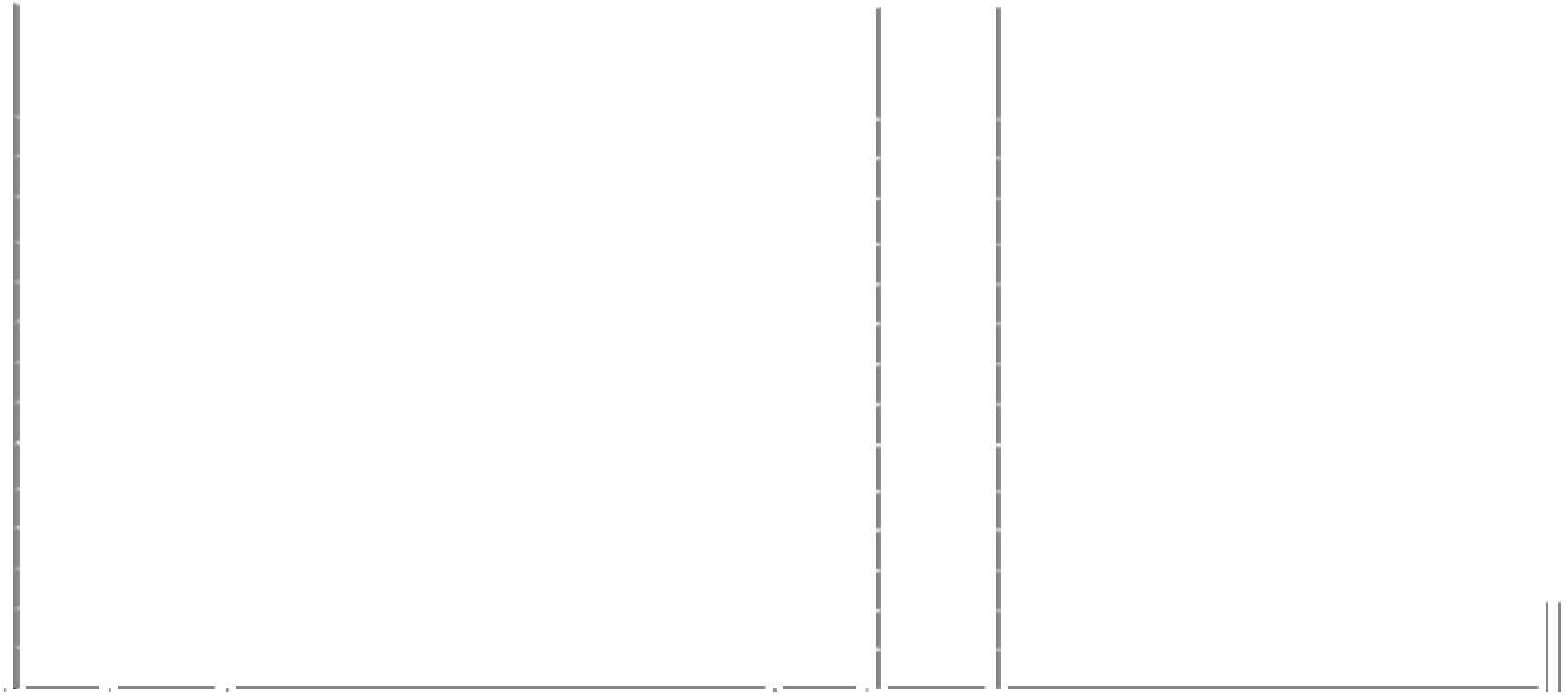
Course Schedule



Week Date

1 2 3

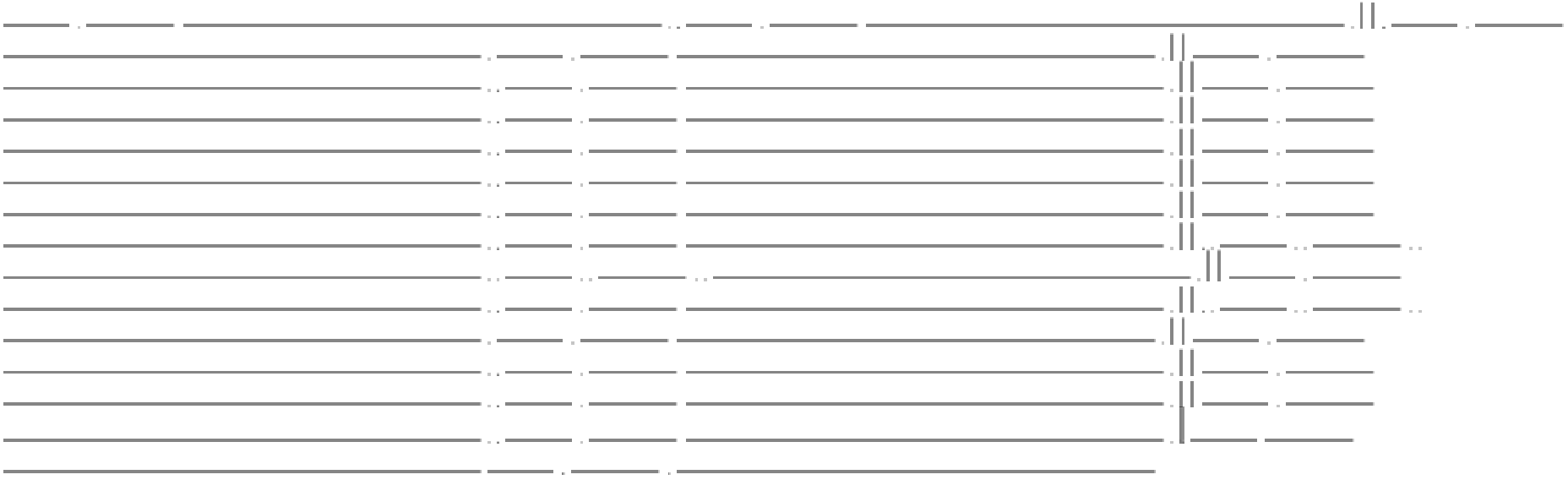
4 5 6 7 8 9

10 11 12 13 14-16

Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules) Introduction Module 1 Module 1 (continued)

Buffer Module 2 Module 2 (continued) Module 3 Module 3 (continued) Midterm Exam

Module 4 Module 4 (continued) Buffer/Repetition Exam Buffer



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APENDIX II: The CLIMASP Course Modules Template Example

Modules Overview

Course	Social Economics
Module 1	Humanistic economics and the economics of the “common good”
Key Concepts	• Oriented towards helping shape economic Policy that is consistent with the integral Values of the Person and a humane Community • Core Questions: How to minimize social Problems or the social Waste of Unemployment, meaningless Work, chronic Poverty, congested Cities, foul Air, Decay of the Family, etc. • Main Objective: Humanizing the Society – Individual Capacity, in the Interest of Society, must be fully realized, as well as human Needs serving as the Basis for rightful Claims on the social Product
Overview	The northern economic path constituting the Social Economy aims to link, democratically, the social and the technological attributes of the knowledge-based

	economy. Thereby, we not only fundamentally alter the current overly technological pre-emphasis, but also serve to transcend mechanical economic thought via a social, humanistic orientation. We begin in this northern grounding chapter by revisiting an originally European social economic orientation. This focuses on economics as a means to bring about humane communities and enterprises. Looking then, in rational northern guise, for a new social structure for the economy, we follow a stream of social-economic consciousness over the last 150 years – from Sismondi to J.S. Mill, from Ruskin to Hobson, from Tawney to Schumacher. We thereby purposefully build on the historical social roots, which we had made visible in chapter 2,

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which include the French Utopians, the Catholic Encyclicals and many other sources. We make this reconnection to these rich social grounds together with contemporary Americans Lutz and Lux, who conclude, that this very 'global' 21st century needs to counteract the

‘western’ individualistic creed. In the process, it will serve to bring about ‘social economics’.

Aim

...

- ...

Learning Outcomes

Units

Unit 1.1 ...

- Lux, K. (1990). Adam Smith’s Mistake: How a Moral Philosopher Invented Economics and Ended Morality. Boston: Shambhala.

- Lutz, M. & Lux, K. (1988). Humanistic Economics – The New Challenge. New York: Bootstrap.

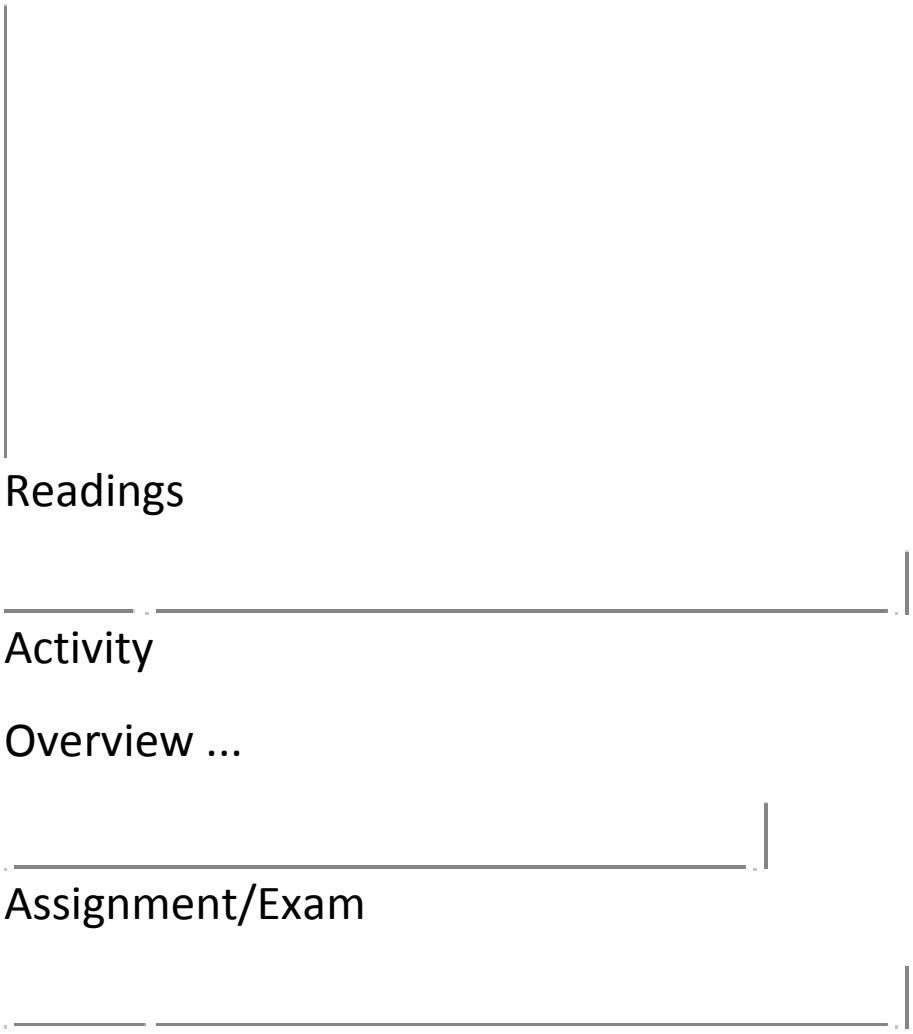
- Schumacher, E.F. (1973). Small is Beautiful: Economics as if People Mattered. London: Abacus.

- Smith, A. (2009). The Theory of Moral Sentiments. Mineola: Dover.

- Smith, A. (2003). The Wealth of Nations. New York: Penguin.

- Robinson, J. (2006). Economic Philosophy. Piscataway: Aldine.

- Sismonde de Sismondi, L. (2008). Political Economy and the Philosophy of Government. Whitefish: Kessinger.


Readings
Activity
Overview ...
Assignment/Exam

Key Concepts

- Overcoming Humankind's social Underdevelopment is likely to be the decisive Factor in the World's social and economic Evolution.

- With the Network Society, a new World is taking shape. The Rise of Informationalism poses major Challenges to the

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	Economy’s social Dimension. It is intertwined with rising Inequality and social Exclusion throughout the World. • It is for People to free themselves, to construct their Practice on the Basis of their Experience, while using whatever Information or Analysis is available to them. Such

	social, economic and political Action is essential for the betterment of Society.
Overview	Recent times, with the social downsides of mainstream economics, have seen a strong 'reemergence of the social'. The global rise of civic society and the World Social Forum, for example, are significant expressions of this global phenomenon. One of the reasons for this emergence can be seen in a fundamentally changed and increasingly complex social and economic context which humankind is facing, captured, for example, in terms like Network Society and Information Economy, which we explore here with the help of Castells. We learn how this new context brings not only economic opportunities, but also massive problems through social inequality and injustice. Furthermore, and this is another interpretation of the 'social', humankind is called to bridge the gap between technological overdevelopment and social underdevelopment. We address this issue with the expertise of the Club of Rome, as well as with Beinhocker's approach to social technologies. Altogether it becomes evident, that a reconnection to the philosophical grounds of a social economy (as done in the previous chapter) is necessary in order to meet current day social challenges.

Aim	...
Learning Outcomes	•...
Units	Unit 1.1 ...
Readings	• □Botkin, J., Elmandjra, M. & Malitza, M. (1979). No Limits to Learning: Bridging the Human Gap. A Report to the Club of Rome. London: Pergamon. • □Meadows, D. et al (1979). The Limits to Growth. New York: Macmillan.

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	• □Castells, M. (1996). The Rise of Network Society. Oxford: Blackwell. • □Beinhocker, E. (2006). The Origins of Wealth – Evolution, Complexity and the radical Re-making of Economics. Random House.
Activity	Overview ...

	Assignment/Exam
Module 3	Participative and innovative learning, individually, communally, economically
Key Concepts	• There is no real Conflict between being determined to resist global Inequality and Injustice and at the same Time Understanding and Facilitating the positive Contributions of globalized Economic, social and cultural Relations across the World. • In an Open Society, we must content ourselves with a Form of social Organization that accepts the Image of human Fallibility, falls short of Perfection but holds itself open to Improvement. This is the Concept of an Open Society – a Society open to Improvement. • The supreme Challenge of our Time is to establish a Set of fundamental Values that applies to a largely transactional, global Society.
Overview	The urgent need to address current day social challenges and to overcome humankind's social underdevelopment, as addressed in the previous chapter, requires

	an economic and societal framework, that is open for learning and continuous improvement. Amartya Sen and George Soros are among those eminent economic thinkers, who promote – in theory and in practice – an ‘open’ economy and society characterized by pluralism and receptivity, relevant for such continuous improvement. Both of them have a deep understanding of today’s complexity as well as of social philosophies of the past. While Soros is philosophically rooted primarily in Europe, with Karl Popper’s approach to an Open Society as his guiding star, Sen draws in addition, for example, on

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	his own Indian heritage. Deliberately we juxtapose Sen and Soros in this chapter, illustrating the need to revisit the theoretical grounds on which a future economy is built from diverse ideological backgrounds, on an ongoing basis. Thereby, we argue, we continuously substantiate and practice ‘open economics’, economics in an open society. This is, for us, a suitable navigational framework for a social, knowledge-based economy.

Aim	...
Learning Outcomes	•...
Units	Unit 1.1 ...
Readings	• Sen, A. (2005). The Argumentative Indian. New York: Farrar, Straus and Giroux. • Sen, A. (1999). Development as Freedom. New York: Anchor. • Bauer, P. (1957). Economic Analysis and Policy in Underdevelopment Countries. Durham: Duke University Press. • Soros, G. (1999). The Crisis of Global Financial Capitalism. New York: Little Brown.

	• Soros, G. (2000). Open Society. New York: Little Brown. • Popper, K. (2002). Open Society and its Enemies. London: Routledge Classics.
Activity	Overview ...
	Assignment/Exam
Module 4	The making of Mondragon as a co-operative enterprise
Key Concepts	• The cooperative Enterprise distinguishes itself from the capitalist, simply in that the latter utilizes Capital in order to make People serve it, while the former uses it to make more gratifying and uplifting the Working Life of the People. • The Enterprise is seen as in a permanent Process of evolutionary Change: it must renew and revitalize itself at all Times due to the inevitable Consequences of the changing Technology and Economy of our World.

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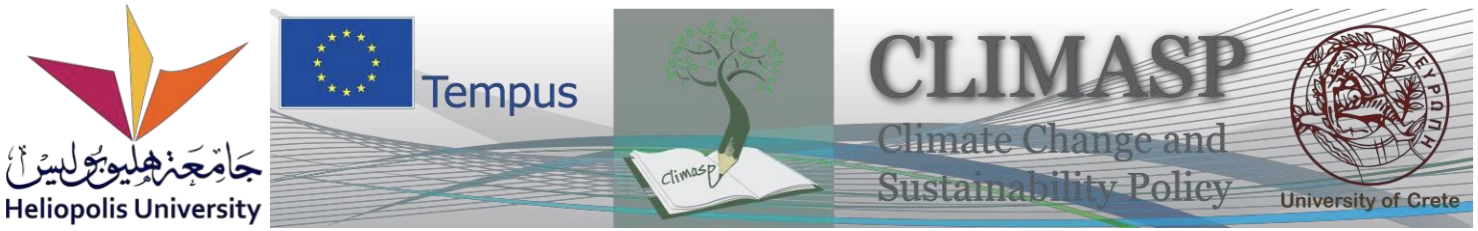
Overview	The case of the Basque Mondragon Cooperatives in Spain is a practical illustration of the northern Social Economy. With Mondragon we build on the prior grounds provided by the economics of the common good and show how the organization's founding father Arizmendi provided Mondragon, from the outset, with a strong social philosophy. Furthermore, Mondragon is an organizational articulation of Open Economics, firstly, because of its inbuilt democratic principles (one worker-one vote) and, secondly, by combining technological with social innovation. Such innovation is promoted through Mondragon's own university and research center. Thereby, the Mondragon Corporation today, whose original roots lay in education, has itself become an exemplar of learning and knowledge creation. In summary, combining good business with social justice, Mondragon is a visionary expression of a social, knowledge-based economy.
Aim	…
Learning Outcomes	•…

Units	Unit 1.1 ...
Readings	• □Whyte, W. & K. (1991). Making Mondragon. Ithaca: Cornell University Press. • □Freire, P. (2000). Pedagogy of the Oppressed. London: Continuum.
Activity	Overview ...
	Assignment/Exam

11



Course Syllabus Sustainable Economics

Instructor Information

Instructor: Office Location: Telephone: Office Hours: E-mail: Website:

Maximilian Abouleish ... ... maximilian.abouleish@hu.edu.eg

Course Identification

Course Number: Course Name: Course Location: Class Times: Prerequisites: Faculty Web Page:

1

2201 Sustainable Economics ... ... Introduction to Integral Economics (2233) ...

جامعة هليوبوليس
Heliopolis University

Course Description/Overview

Participants of this course will get an overview on New Economics and Real Economics as a basis for the subsequent course Sustainable Economics II. This parts of the Western Economic Path of Sustainable Economics is concerned with (1) the extent economic activity

of our society is rooted in ecological principles that sustain life, and (2) the extent our economy is transforming itself from a paradigm of domination to partnership and from promotion of phantom wealth to real wealth.

Course Learning Objectives

91. To integrate self-sufficient, developmental, social and living economics

92. To position living economics as an evolution of market based, free enterprise-and-comparative advantage

93. To interconnect living economics and sustainable development Course Content Learning Outcomes Upon successful completion of this course, students will be able to:

    To realign economics with life

    To distinguish between “self made man”, and “living” principles of “self making”

    To be able to connect initiative taking with living enterprise

To position a living economy within conventional economics inclusive of international trade Furthermore, students will gain the following transferable skills and other attributes:

- Internalize principles and processes of spontaneity and improvisation
- Transfer powers of improvisation from the arts to enterprise
- To become enterprising in your own life and learning
- Internalize the connectedness between nature, culture, knowledge and enterprise 2

جامعة هليوبوليس
Heliopolis University

Learning and teaching strategies

- Lectures/seminars/group exercises – on becoming enterprising

- Drawing on the movement and dance, music and drama to develop powers of improvisation, spontaneity and risk-taking

- Practical projects focused on action research and learning

- Oral, visual and written presentation focused explicitly on enterprise, teamwork and the exercise of leadership Course Resources Course Website(s) Required Course Texts and Materials

- Anielski, M. (2009). Economics of Happiness. Gabriola Island: New Society Publications.

- Eisler, R. (2007). The Real Wealth of Nations. San Francisco: Berrett Koehler.

- Korten, D. (2009). Agenda for a New Economy. San Francisco: Berrett Koehler.

- Lessem, R. & Schieffer, A. (2010). Integral Economics: Releasing the Economic Genius of your Society. Chapters 2, 17-20. Farnham: Gower-Ashgate. Optional Course Texts and Materials Course Policies Grading System Assignments and Grading Scheme This course is assessed through course and fieldwork, as well as formal assessment, with a

pre-emphasis on activity, enterprise and the achievement of results. Grading Policy
Grades can be based on the following: (Example) 3

Assignments and/or Presentation	25%

Exams (Mid-term and Final)	50%
Class attendance/participation	25%
Total Points	100

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once

the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

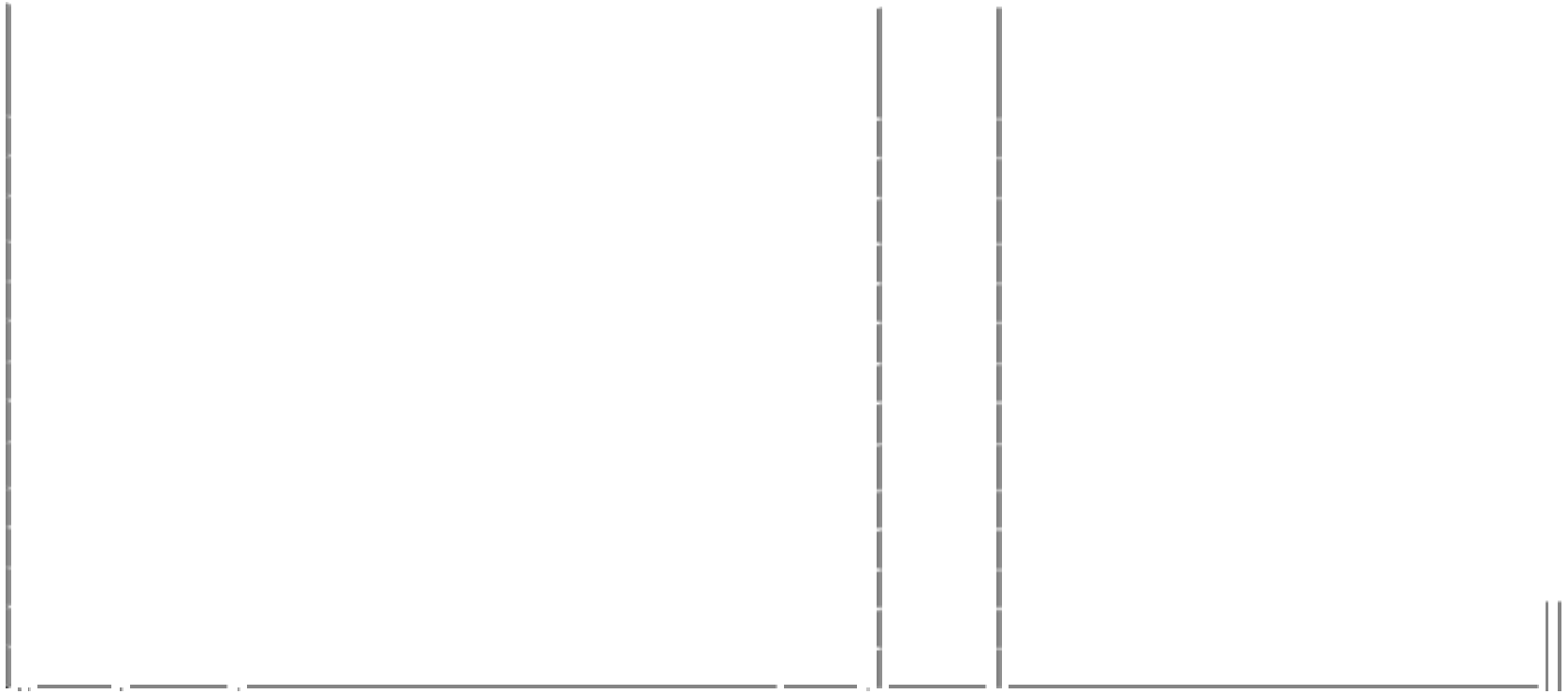
This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify the professor before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 25% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

4

Course Schedule



Week Date

1 2 3

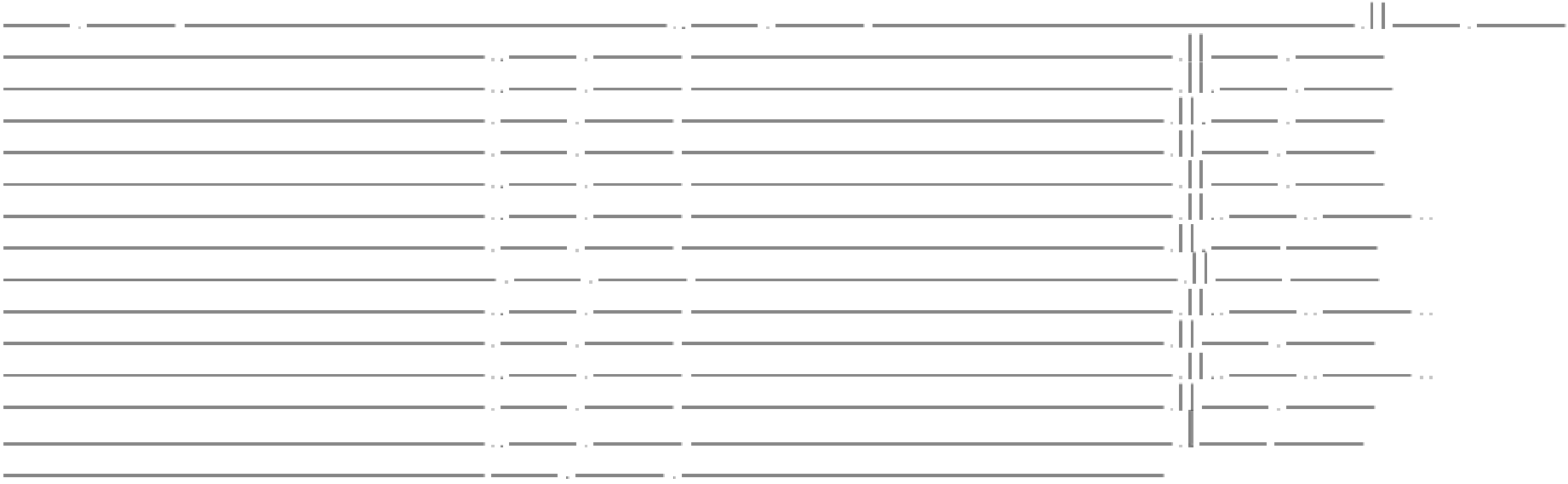
4 5 6 7 8 9

10 11 12 13 14-16

Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules) Introduction Module 1 Module 1 (continued)

Buffer Module 2 Module 2 (continued) Module 3 Module 3 (continued) Midterm Exam

Module 4 Module 4 (continued) Buffer/Repetition Exam Buffer



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APENDIX II: The CLIMASP Course Modules Template Example

Modules Overview

Course	Sustainable Economics
Module 1	The new economic agenda to build sustainable development
Key Concepts	• □New Economics is rooted in the Recognition that Human Life and economic Activity are an interdependent Part of the wider ecological Principles that sustain Life on Earth and will either operate sustainably within those Processes or bring about their own Demise. • □New Economics includes a new Approach to Development: need oriented, endogenous (that stems from the Heart of each Society), self-reliant, ecologically sound and based on structural Transformation.
Overview	The Western economic path towards a Living Economy serves to renew the economic mainstream from within the 'west'. For over forty years there have been serious western economists, who have sought a radical shift from the conventional economic wisdom. Prominent mainly Anglo-Saxon (with significant exceptions) economic

	thinkers such as Hazel Henderson, Herman Daly, Manfred Max-Neef (Chilean), Susan George, James Robertson, Paul Ekins, and Johan Galtung (Norwegian) are among these voices. The main connecting themes for them are environmental sustainability and social justice. Jointly, they initiated a 'new economics', the focus of this chapter. Aspiring to establish a fundamental departure from the existing economic paradigm, such a new economics, for James Robertson, is meant to be Sane, Ecological and Humane (SHE). Altogether, SHE aims to be life supporting, a 'living economy, equally concerned with community life and natural life.
Aim	...

6

Learning Outcomes	•...
Units	Unit 1.1 ...

Readings	• □Ekins, P. (Ed) (1986). The Living Economy. New York: Routledge. • □Max-Neef, M. (1992). From the Outside looking in: Experiences in Barefoot Economics. London: Zed Books. • □Brekke, K.A. (1997). Economic Growth and the Environment: On the Measurement of Income and Welfare. Cheltenham: Edward Elgar. • □Henderson, H. (1981). The Politics of the Solar Age: Alternatives to Economics. New York: Doubleday. • □Robertson, J. (1985). Future Work: Jobs, Self-Employment and Leisure after the Industrial Age. London: Temple Smith Gower. • □Brekke, K.A. (1997). Economic Growth and the Environment: On the Measurement of Income and Welfare. Cheltenham: Edward Elgar.
Activity	Overview ...
	Assignment/Exam

Module 2	Partnership as opposed to domination economics
Key Concepts	• Real Wealth Economics builds on a new economic Map that includes the following six Sectors: Household Economy, unpaid Community Economy, Market Economy, illegal Economy, Government Economy, and the Natural Economy • It is based on Partnership, not Domination; it is emphasizing the Main Street (Real Wealth) Economy, as opposed to the Wall Street (Phantom Wealth) Economy. • It is oriented towards the Transformation of Financial Markets, especially the Money Systems in Place; Conscious

7

———	Choice in Money Systems at all Levels – global, national, corporate, grass-roots etc. – is seen as one of the most powerful Leverage Points for a new Economy.
Overview	With Riane Eisler and David Korten from the US and Bernard Lietaer originally from Belgium, we are introducing three eminent economic thinkers based in America, who

	have contributed together to a fundamentally revised perspective on ‘wealth’. Building on a new economic ‘partnership’ map, initially provided by Eisler, Korten has subsequently formulated a new economic agenda, envisioning the transition from an economy focusing on phantom wealth to real wealth. A significant catalyst in such a transition, however, will be the revision of the current day financial and monetary systems. For this we turn to financier and former architect of the Euro, Bernhard Lietaer, whose innovative approach to finance and money seeks a balance between conventional and so-called complementary currencies. Altogether, this chapter is an illustration of a rich array of emergent thinking within the west, that pursues an integrative approach to economics: bridging tradition and modernity, the developing and the developed world, wo/man and nature, as well as masculine and feminine, material and immaterial aspects of the economy. These emergent approaches thereby take on from where ‘new economics’ leaves off, towards a ‘sane, humane and ecological’ economy.
Aim	…

Learning Outcomes	•...
Units	Unit 1.1 ...
Readings	• □Eisler, R. (2007). The Real Wealth of Nations: Creating a Caring Economics. San Francisco: Berrett Koehler. • □Sen, A. (2000). Development as Freedom. Harpswell: Anchor. • □Korten, D. (2005). The Great Turning: Empire to Earth Community. San Francisco: Berrett Koehler. • □Korten, D. (2009). Agenda for a New Economy. San Francisco: Berrett Koehler.

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	• □Lietaer, B. (2001). The Future of Money. Creating New Wealth, Work and

	a Wiser World. New York: Century. • Lietaer, B. (2004). The Soul of Money: Beyond Greed and Scarcity. Denver: Unpublished Manuscript. • Giarini, O. (1980). Dialogue on Wealth and Welfare: An Alternative View of World Capital Formation. London: Pergamon.
Activity	Overview ...
	Assignment/Exam
Module 3	The economics of wellbeing
Key Concepts	• Focuses on Real Life Issues. In measuring real Wealth (genuine Wealth), not only monetary and worldly Possessions but also qualitative Attributes like Health (physical and mental), spiritual Well-Being, healthy Relationships, Love and Respect, and the Well-Being of Nature are included. Genuine Wealth is

	thereby grounded in what we value most about Life. • □A Genuine Wealth Indicator integrates and harmonizes five Categories of Wealth or Capital, which collectively contribute to the good Life and form the Basis for an Economy of Well- Being: Human Capital, Social Capital, Natural Capital, Built Capital and Financial Capital.
Overview	In this western navigational chapter we demonstrate through the work of Canada's 'well-being economist' Mark Anielski, how a new economic framework that focuses on generating and measuring real genuine wealth might look. Such genuine wealth does not only include monetary and worldly possessions, but qualitative attributes like physical and mental health, spiritual well- being, healthy relationships, love and respect, and the well-being of nature. By discussing core features of a Genuine Progress Indicator and illustrating various forms of its practical application, this chapter provides tangible means of navigation to steer a society beyond the conventional focus on Gross Domestic Product (GDP).

9

Aim	...
Learning Outcomes	•...
Units	Unit 1.1 ...
Readings	• □Lovelock, J. (1982). Gaia: A new Look on Life on Earth. Oxford: Oxford Paperbacks. • □Capra, F. (1997). The Web of Life: A Scientific Understanding of Living Systems. Port Moody: Anchor. • □Anielski, M. (2007). The Economics of Happiness. Gabriola Island: New Society Publishers. • □Rima, I. (2001). The Development of Economic Analysis. London: Routledge.
Activity	Overview ...

	Assignment/Exam
Module 4	Sustainable enterprise: the case of Interface Carpets in the U.S.
Key Concepts	• The Sustainable Enterprise is a restorative Enterprise, modeled after Nature (often inspired by Biomimicry); it puts back more than its take out from the Earth. A Strategy to achieve that is: reduce, reuse, reclaim, recycle and redesign. • Sustainability does not stop at the Organization. The final Front calls for the Redesign of Commerce itself. Finally, it engages, in caring for human and natural Capital (Earth) as much as it has traditionally cared for financial Capital. • Thereby social Equity and environmental Stewardship are given their natural Places alongside economic Progress.
Overview	With the concept of the Sustainable Enterprise and America's Interface, the world's largest modular carpet manufacturer, as a practical example of 'Living Economics', we come to the culmination of the western economic path. Interface, as the other cases

	we have introduced, is an exemplar of a microeconomic seed corn for a new macroeconomic paradigm. What makes cases like

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	Interface highly relevant for our Integral Economics, is not only their innovative practice, but it is the unique demonstration of how a critical conceptual and philosophical revision of mainstream economic theory, has led to a new path breaking practice. In the case of Interface, by now a global icon of the sustainable enterprise, its commitment to redesigning the enterprise according to nature's principles, thereby not only restoring but also 'giving back' to the earth, makes it a formidable exemplar for a Living Economy.
Aim	...
Learning Outcomes	•...

Units	Unit 1.1 ...
Readings	• □Anderson, R. (1998). Mid-Course Correction: Toward a Sustainable Enterprise: The Interface Model. Vermont: Chelsea Green. • □Hawken, P. (1994). The Ecology of Commerce: A Declaration of Sustainability. New York: HarperBusiness. • □Meadows, D. (1993). Beyond the Limits: Confronting Global Collapse, Envisioning a Sustainable. Vermont: Chelsea Green. • □Anderson, R. (Spring 2004). Nature and the Industrial Enterprise. In: Engineering Enterprise. Alumnae Magazine for IsyE. Atlanta: Georgia Institute of Technology. • □Benyus, J. (2002). Biomimicry: Innovation Inspired by Nature. New York: Harper Perennial.

Activity	Overview ...
	Assignment/Exam

11

EGYPT PSU

Air Pollution

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
385. Environmental awareness 386. Strategic planning 387. Environmental awareness 388. Environmental management 389. Technology and innovation 390. Climate change adaptation 391. Risk assessment 392. Climate variability 393. Weather and climate 394. Climate change communication 395. Climate change and health 396. Strategic planning and climate change 397. Role of international institutions 398. Climate change: Science, impacts &	542. Adaptive learning and self-reflection; 543. Communicating 544. Contextualising 545. Critical, systemic and futures thinking 546. Debating 547. Discourse 548. Futures thinking 549. Leadership 550. Local knowledge 551. Motivate and manage change 552. Problem solving 553. Resolve ethical dilemmas 554. Team management	625. Accountability 626. Confident 627. Decisive 628. Democratic 629. Empathy 630. Environmental justice 631. Openness to novelty and change 632. Optimism 633. Organised 634. Respect and care for the community 635. Respect for diversity 636. Social cohesion 637. Social responsibility 638. Transparency 639. Human rights 640. Sense of urgency 641. Human wellbeing 642. Social responsibility	105. Discuss the effects of air pollution on vegetation, soils, fresh water, and buildings. 106. Identify the characteristics of air pollution, relevant regulations, and control technologies. 107. Identify the different types of air pollutants. 108. Anticipate possible future environmental change and identify possible development consequences. 109. Estimate air pollution concentrations as a function of emission, meteorology, topography and the built environment for a combination of road and industrial sources. 110. Disseminate emission and air quality results to a wider audience. 111. Estimate health impact of changes in air pollution

scenarios 399. Future climate change scenarios		643. Perspective 644. Co-responsibility 645. Systematic 646. Focussed	

Course Syllabus

Course Number:

Air Pollution

Port Said University, Faculty of Science, Department of Physics,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of science Campus
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Air Pollution**
Course Location: University Campus
Class Times:
Prerequisites:

Faculty Web Page: www.sci.psu.edu.eg

Course Description/Overview

The present course is intended to raise the students' awareness. It introduces students to the fundamentals of air pollution with a background on historical perspective on air pollution and a commentary on current air quality policies and standards It focuses on understanding the atmospheric phenomena and the destruction of natural balance, including noise pollution, inevitably brought about by human activities, It provides an overview of the history of air pollution, air pollutants, effect of air pollution on climate, air quality management, and indoor air pollution. It does so through tackling the following aspects: 1) natural sources of air pollution; 2) anthropogenic sources of air pollution; 3) airborne particulate matter; 4) size distribution of atmospheric aerosols; 5) negative impacts; 6) global warming; 7) air pollution act; 8) atmospheric stability; 9) thermal invasion; 10) modelling of air pollution and control devices. That is they are asked to read and summarize articles on air pollution and its sources. They are invited to discuss effect of air pollution on climate at local, national and international scales. In short, the course provides an appropriate chance for the students to get the minimum knowledge of major air pollutants; their sources and their effects (environmental, economic and health) and how emissions are estimated from road traffic and industrial sources.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of air pollution; b) to raise awareness of the learners about effects of air pollution on climate; c) help learners use traditional and electronic tools to identify the risks the different types of air pollutants; and d) to highlight the importance of renewable energy resources as clean and safe resources to the environment.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

112. Discuss the effects of air pollution on vegetation, soils, fresh water, and buildings.
113. Identify the characteristics of air pollution, relevant regulations, and control technologies.
114. Identify the different types of air pollutants.
115. Anticipate possible future environmental change and identify possible development consequences.

116. Estimate air pollution concentrations as a function of emission, meteorology, topography and the built environment for a combination of road and industrial sources.
117. Disseminate emission and air quality results to a wider audience.
118. Estimate health impact of changes in air pollution

Required Course Texts and Materials

Hands-out prepared by the instructor for the

- Environmental pollution and control , Ann Arbor, 1982.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		History of air pollution;
2		Current policies, standards and objectives;
3		Sources of air pollution;
4		Effects of major air pollutants;
6		Monitoring of emissions and air pollutants in ambient air;
7		Modelling and control of emission from road transport;
8		Modelling and control of emission from industrial sources;
9		Chemistry and dispersion of air pollution in atmosphere;
10		Air pollution modelling approaches;
11		Commercial air quality models (ADMS, USEPA models;
12		Indoor air pollution;
13		Personal exposure to air pollution

Atmospheric Physics

KNOWLEDGE (Concepts, theories,	**SKILLS (Tools, methodologies,**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**

processes)	**dynamics)**		
400. Environmental awareness 401. Gender-sensitive response to climate change 402. Climate change communication 403. Fairness and climate change justice 404. Future climate change scenarios	555. Adaptive learning and self-reflection; 556. Awareness and advocacy raising 557. Communicating 558. Contextualising 559. Critical, systemic and futures thinking 560. Debating 561. Discourse 562. Futures thinking 563. Integrated assessment 564. Leadership 565. Local knowledge 566. Mapping gender impacts 567. Motivate and manage change 568. Networked learning 569. Prioritising 570. Problem solving 571. Resolve ethical dilemmas 572. Scenario analysis and planning 573. Team management	647. Accountability 648. Confident 649. Decisive 650. Democratic 651. Empathy 652. Environmental justice 653. Gender-sensitive 654. Global mind-set/ consciousness 655. Interdependency 656. Needs vs. wants 657. Nonviolence & peace 658. Openness to novelty and change 659. Optimism 660. Organised 661. Respect and care for the community 662. Respect for diversity 663. Social cohesion 664. Social responsibility 665. Stewardship 666. Tolerance	33. Describe the biosphere through the study of the natural state of ecosystems, the relationships between organisms and their environment and managing human and water resources. 34. Explain the relationships between organisms and their environment and managing human and water resources. 35. Question the relationships between Earth's atmosphere and the atmospheres of the other planets using fluid flow equations, chemical models, radiation balancing, and energy transfer processes in the atmosphere (as well as how these tie into other systems such as the oceans). 36. Anticipate possible future environmental changes and possible development consequences. 37. Understand scattering theory, wave propagation models, cloud physics, statistical mechanics and spatial statistics which are highly mathematical and related to physics 38. Demonstrate the knowledge and understanding of the links of atmospheric physics to meteorology and climatology. 39. Use the different tools and equipments to collect data needed for studying the atmosphere and

		667. Transparency 668. Virtue	atmospheric changes, 40. Anticipate the effect of atmosphere on climate change.

Course Syllabus

Course Number:

Atmospheric Physics

University of Port Said, Faculty of Science, Department of Physics,
Spring Semester

Instructor Information

Instructor: Dr
Office Location: Faculty of Science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Atmospheric Physics**
Course Location: University Campus
Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

This course examines the dynamics of the biosphere through the study of the natural state of ecosystems. Emphasis is on the explanation of the relationships between organisms and their environment and on managing human and water resources. The application of physics to the study of the atmosphere attempts to model Earth's atmosphere and the atmospheres of the other planets using fluid flow equations, chemical models, radiation balancing, and energy transfer processes in the atmosphere (as well as how these tie into other systems such as the oceans). In order to model weather systems, atmospheric physicists employ elements of scattering theory, wave propagation models, cloud physics, statistical mechanics and spatial statistics which are highly mathematical and related to physics. It has close links to meteorology and climatology and also covers the design and construction of instruments for studying the atmosphere and the interpretation of the data they provide, including remote sensing instruments.

Course Learning Objectives

The overreaching goals of this course are: a) to examines of the dynamics of the biosphere through the study of the natural state of ecosystems; b) to provide the basic knowledge of environmental and resources studies; c) to raise awareness of the learners about the need to examine the relationships between organisms and their environment and managing human and water resources.; d) to model Earth's atmosphere and the atmospheres of the other planets using fluid flow equations, chemical models, radiation balancing, and energy transfer processes in the atmosphere (as well as how these tie into other systems such as the oceans).; e) to employ elements of scattering theory, wave propagation models, cloud physics, statistical mechanics and spatial statistics which are highly mathematical and related to physics.; f) to examine the links to meteorology and climatology; g) and also covers the design and construction of instruments for studying the atmosphere and the interpretation of the data they provide, including remote sensing instruments.

Course Objectives Learning Outcomes

Upon successful completion of this course, students will be able to:

41. Describe the biosphere through the study of the natural state of ecosystems, the relationships between organisms and their environment and managing human and water resources.
42. Explain the relationships between organisms and their environment and managing human and water resources.
43. Question the relationships between Earth's atmosphere and the atmospheres of the other planets using fluid flow equations, chemical models, radiation balancing, and energy transfer processes in the atmosphere (as well as how these tie into other systems such as the oceans).
44. Anticipate possible future environmental changes and possible development consequences.
45. Understand scattering theory, wave propagation models, cloud physics, statistical mechanics and spatial statistics which are highly mathematical and related to physics
46. Demonstrate the knowledge and understanding of the links of atmospheric physics to meteorology and climatology.
47. Use the different tools and equipments to collect data needed for studying the atmosphere and atmospheric changes,
48. Anticipate the effect of atmosphere on climate change.

- **Course Resources**

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Dynamics of the biosphere.
3		The natural state of ecosystems.
4		The links of atmospheric physics to meteorology and climatology.
5		The relationships between organisms and their environment and managing human and water resources.
6		Instruments for studying the atmosphere and the interpretation of the data they provide, including remote sensing instruments.

Basics of Environmental Sciences

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
405. Gender-sensitive response to climate change 406. Climate change communication 407. Fairness and climate change justice 408. Future climate change scenarios 409. Conflict over natural resources. 410. Multilateral environmental agreements 411. Future climate change scenarios 412. Policies and regulation 413. Technology and innovation 414. Consumer habits	574. Adaptive learning and self-reflection; 575. Awareness and advocacy raising 576. Communicating 577. Contextualising 578. Critical, systemic and futures thinking 579. Debating 580. Discourse 581. Futures thinking 582. Integrated assessment 583. Leadership 584. Local knowledge 585. Motivate and manage change 586. Networked learning 587. Prioritising	669. Accountability 670. Confident 671. Decisive 672. Democratic 673. Empathy 674. Environmental justice 675. Interdependency 676. Openness to novelty and change 677. Optimism 678. Organised 679. Respect and care for the community 680. Respect for diversity 681. Social cohesion 682. Social	80. Discuss the basic terminology and core concepts of environmental sciences. 81. Identify the physical, chemical, biological, political and economic dimensions of environment. 82. Conduct survey of environmental systems, human interactions with them and the use of distinctive areas on Earth. 83. Identify the risks of the degradation of environment. 84. Question the relation between sustainable development and clean environment. 85. Anticipate possible future environmental change and possible development consequences. 86. Appreciate the positive impacts of reasonable use of environmental resources. 87. Demonstrate knowledge and understanding of

415. Anticipation and monitoring 416. Environmental awareness 417. Environmental management 418. Green products/design 419. Green growth	588. Problem solving 589. Resolve ethical dilemmas 590. Scenario analysis and planning 591. Team management	responsibility 683. Social Justice 684. Basic human needs 685. Human rights 686. Sense of urgency 687. Health care 688. Inclusive participation	relationship between poverty and unsafe environment. 88. Use the different tools and equipments to conduct survey of environmental systems, human interactions with them and the use of distinctive areas on Earth. 89. Appreciate the importance of the biosphere through the study of the natural state of ecosystems.

Course Syllabus

Course Number:

Basics of Environmental Sciences

University of Port Said, Faculty of Science, Department of Environmental Sciences, Spring Semester

Instructor Information

Instructor:
Office Location: Faculty of Science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Basics of Environmental Sciences**
Course Location: University Campus
Class Times:
Prerequisites:

Faculty Web Page:

Course Description/Overview

This course provides an interdisciplinary survey of environmental and resources studies, examining its physical, chemical, biological, political and economic dimensions. Emphasis will be on concepts and methods that can be applied to the analysis and understanding of a range of specific environmental problems. A survey of environmental systems, human interactions with them and the use of distinctive areas on Earth are introduced. Emphasis is on environmental concepts, problems, and research methods in Egypt. This course examines the dynamics of the biosphere through the study of the natural state of ecosystems. Emphasis is on the explanation of the relationships between organisms and their environment and on managing human and water resources. In short, the course provides an appropriate chance for the students to get the minimum knowledge of safe environment.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of environmental and resources studies; b) to raise awareness of the learners about the need to examine physical, chemical, biological, political and economic dimensions of environment; c) emphasize on concepts and methods that can be applied to the analysis and understanding of a range of specific environmental problems; d) help learners to conduct survey of environmental systems, human interactions with them and the use of distinctive areas on Earth; e) use traditional and electronic tools to identify the risks of the degradation of environment; and f) to highlight the importance of the biosphere through the study of the natural state of ecosystems.

Course Objectives Learning Outcomes

Upon successful completion of this course, students will be able to:

90. Discuss the basic terminology and core concepts of environmental sciences.
91. Identify the physical, chemical, biological, political and economic dimensions of environment.
92. Conduct survey of environmental systems, human interactions with them and the use of distinctive areas on Earth.
93. Identify the risks of the degradation of environment.
94. Question the relation between sustainable development and clean environment.
95. Anticipate possible future environmental change and possible development consequences.

96. Appreciate the positive impacts of reasonable use of environmental resources.
97. Demonstrate knowledge and understanding of relationship between poverty and unsafe environment.
98. Use the different tools and equipments to conduct survey of environmental systems, human interactions with them and the use of distinctive areas on Earth.
99. Appreciate the importance of the biosphere through the study of the natural state of ecosystems.

- **Course Resources**

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Energy Resources and Supply.
3		Renewable energies and clean technologies.
		Solar Energy, solar cells, solar thermal heating systems, and electricity generation.
		Tidal and Hydro as renewable energy resources.
		Renewable Energy Integration and Energy Efficiency in the Built Environment
		Research Design Methods.

Dear Prof.Vassilis

All greetings from Port Said University's CLIMASP Project Team, we hope you're fine.
Here's our Required Equipments which we approved to buy to the CLIMASP Lab.

Ser.	Item	Unit	Quantity
1	**Desktop Computer** Dell optoplex 9020 with i7 Ram 8GB, HARD 1TB, Monitor 18.5 inch	Number	12
2	**Laptop HP** Core I7, 8GB RAM , 1TB Hard Disk , 15 display	Number	3
3	**Switch Cisco** PART NO (SRW2024 P-K9-EU)	Number	1
4	**Access Point** AIR-SAP16021 –I-K9 802.11a/g/n standalone AP,Int Ant, I Rag Domaim	Number	1
5	**Color Printer** HP color GP 5225N printer (ce4711A)	Number	1
6	**Scanner** HP Scan jet 5590 Digital Flatbed scanner (L1910A)	Number	1

7	**Projector include cables and installation** In focus IN112 Projector	Number	1
8	**Video conference** Video conference scopia XT5000	Number	1

Best Regards.

Description of the Environmental Psychology Course

List of cognitive concepts

Basic competencies	Psychological Traits	Skills	Knowledge
Explains the causes of environmental pollution	Balances between psychological bases and entrances to the interpretation of the relationship between behavior and environment	Uses the Correlation Method	Clarifies the concept of the environment
Uses the Internet	Concludes the goals	Displays the causal	Defines the concept

and global networks in search for programs of the most important environmental education	of environmental Education	relationship within the framework of the experimental method	of environmental psychology
Acquires skills of individual's positive personal behavior	Mentions examples of types of pollution in the environment	Masters methods of collecting information and data about the phenomenon studied	States the concept of environmental education
Collects reports and information about people's responses to environmental conditions	Suggests a roadmap for Environmental Action to try to limit environmental pollution	Builds projective tests and measurements	Mentions the concept of environmental education
Communicates with peers to complete assigned work.	Mentions evidence on the existence of pollution in the surroundings	Masters writing self-reports	Explains the concept of perception
Tackles self-dependence in writing research on the role of	Concludes the negative impact on health, resulting from water	Identifies the causes that lead to the occurrence or non-occurrence of a	Enumerates the concept of environmental perception

community in the reduction of environmental pollution	pollution	phenomenon in the context of the Descriptive Method	
Acquires skills of positive behavior towards the environment	Discusses ways of changing psychological attitudes toward environment	Plans to explain how difficult it is to apply the scientific method and experimental control	Clarifies principles of learning
Draws a comprehensive blueprint for the most important types of environmental pollution that resulted in climatic changes in the world	Proposes new methods to help parents raise children properly	Criticize the conduct of laboratory experiments in environmental psychology	Mentions the theoretical bases of the interpretation of the relationship between the environment and behavior

*** Study Plan for the course:**

Course number: ……..
Course Name: Environmental Psychology
Semester: ……..

*** Information about the instructor:**

- Instructor's Name: ……..
- Location and Office Number: ……
- Tel: ……..
- Office Hours: ……..
- E-mail: ……..
- Website: ……

* Definition of the course:
- Course No.:
- Course Title: Environmental Psychology
- Place:
- Timing of the lectures:
- Prerequisite:
- College Website:

*** Brief description of the course: (about 15 lines)**

The course of environmental psychology includes the following:
Chapter one: includes definition of environmental psychology, its topics, scientific methods, and the necessity that led to its emergence. Chapter two depends on developing positive behavior towards the environment and all fields in which we can improve human behavior regarding environmental issues. This means a paramount necessity for the existence of the so-called environmental instruction and environmental education in addition to causes that led to the failure of all environmental educational programs in Arab societies. The proof of this is the suffering of the environment around us from many problems, including problems of pollution, wastes, water and energy saving. In chapter three, we can recognize the psychology of environment, study its psychological and health effects on human society, and know the sources and causes of environmental pollution. Chapter four deals with ways to cure problems of the environment through the role the

community and university play in the development and improvement of environment in the fight against pollution. Chapter five contains presentation of the theoretical foundations and introductions that constitute the relationship between the environment and human behavior, the formation of environmental perception and factors that affect this perception, environmental trends, and the role of the principles of learning in their composition and how they are measured.

*** Learning outcomes included in the Content; derived from the list of concepts:**

- Mention the theoretical foundations for the interpretation of the relationship between the environment and behavior.
- Explain the causes of environmental pollution.
- Acquire the skills of positive behavior towards the environment.
- Draw a comprehensive blueprint for the most serious types of pollution in the environment, which resulted in climatic changes in the world.
- Discuss ways of changing psychological attitudes toward environment.

* A list of learning sources:

فرانسيس ماك أندرو (2002). علم النفس البيئي، ترجمة: عبد اللطيف محمد خليفة، جمعة سيد يوسف، مطبوعات جامعة الكويت، الكويت.

- عبد الرحمن محمد عيسوي (1997). في علم النفس البيئي، منشأة المعارف، الإسكندرية.

- طلعت منصور غبريال (1982). البيئة والسلوك، حوليات كلية الآداب، جامعة الكويت، الحولية رقم (3)

- بين البيئة والسلوك البشري، الطبعة الأولى، الكويت، دار البحوث العلمية على عسكر، محمد الأنصاري (1993). علم النفس البيئي: تفسير نفسي للعلاقة.

- مهنا محمد غنايم (1988) من أساليب التربية البيئية في المضمون المدرسي، ندوة الإنسان والبيئة، مكتب التربية لدول الخليج، ص 76.

- والعلوم، تونس لمراحل التعليم العام في الوطن العربي ، المنظمة العربية للتربية والثقافة محمد صابر سليم، (1988) "المفاهيم الأساسية" مرجع في التعليم البيئي

- الثانوية، رسالة دكتوراه غير منشورة، والمتغيرات النفسية والاجتماعية في السلوك البيئي لدى طلاب المرحلة طارق على محمود على (2002) . أثر الوعي البيئي بالإسماعيلية، جامعة قناة السويس مودعة مكتبة كلية التربية.

- نظيفة أحمد سرحان (2005). منهاج الخدمة الاجتماعية لحماية البيئة من التلوث، دار الفكر العربي، القاهرة.

- Websites linked to the course:

http://pubcouncil.kuniv.edu.kw/aass/homear.aspx?id=8&Root=yes&authid=469
http://www.ektab.com/

- Texts and instructional materials necessary for the course:

*** Assignments and methods of Assessment:**

- Assessment will be graded on a scale of zero to 10 marks, and the degree of success starts at 50% or 60%
- Assessment Policy

Assignments	80
Tests	----
Attendance and participation	20
Total	100

*** Policies adopted in teaching the course:**

- Delays in the delivery of assignments?!
- Methods or **(policies)** of classroom management:
- Dealing with learners with disabilities:

*** Timetable of lectures (lessons):**

Week	Date	Subject
One & Two		Environmental Psychology: definition, theme and methods

Three & Four		The development of positive behavior towards the environment
Five & Six		Psychology of the environment, and its health and psychological effects
Seven & Eight		Ways to solve environmental problems
Nine & Ten		Theoretical bases that explain the relationship between environment and behavioral - environmental perception
Eleven & Twelve		Environmental attitudes
Thirteen & fourteen		Suggested activities

*** Guiding model for course modules**

Module I: Environmental Psychology: definition, themes, and methods

- The basic concepts of the module: concept of the environment - concept of environmental psychology
- A brief description of the Module: definition of the environment and its types, topics of environmental psychology and necessity that led to its emergence, curricula used in it, and what characterizes it
- Module goal: is to identify the environment and its types, and environmental psychology as a science that should be

studied

- Learning Outcomes: It is expected that the student will be, after the completion of the lesson, able to:

(A) state the concept of environmental psychology.
(B) discuss the necessity that led to the emergence of environmental psychology.
(C) clarify the curricula used in the study of environmental psychology with no errors.

*** Activities**

1. Visiting the Association and the Council of Environmental Protection, and attempting to execute their objectives
2. Designing or developing a program for environmental awareness
3 Picking pictures out of newspapers and magazines, and analyzing their content, then comparing among them in terms of their expected impact
4. Coming up with the concept of each of these four words: information - fact - law - theory
5. Choosing one of the theories of psychology, and the stages of concluding it.
6. Student presents: what s/he feels, and how s/he behaves when s/he faces one of the situations mentioned in the introductions assigned for the interpretation of the relationship between environment and behavior, for his/her peers.
7. A student presents one of the situations in which s/he feels adapted, and the ones in which s/he lacks his/her ability, and compares between the causes of each feeling.
8 What is the relationship among the following processes: sensation, attention, perception?
9 In one situation, different individuals develop different perceptions. Explain via environmental situations you have experienced?
10 Students' choice of two environmentally different residential areas and recording the reaction of the population at the time of the processes of repair in their streets for a relatively long period; perspective of the student to express his/her opinion is to be taken into account.
11. Posing an open-ended question on at least ten members whether they are aware of the dangers threatening the environment in which they are present

12 Making a comparison between the four different definitions of psychological attitude, using a number of references
13. The attitude of student may change towards an a particular environmental or social issue, and then s/he identifies the factors that were behind the change.
14. Concluding the relationship between programs that some candidates present and voters' attitudes in certain areas.
15. Thinking in a certain way to get to know the attitudes of population of the local environment towards a large project will lead to a comprehensive environmental change.

Additional sources for reading

- فرانسيس ماك أندرو (2002). علم النفس البيئي، ترجمة: عبد اللطيف محمد خليفة، جمعة سيد يوسف، مطبوعات جامعة الكويت، الكويت.
- عبد الرحمن محمد عيسوي (1997). في علم النفس البيئي، منشأة المعارف، الإسكندرية.
- طلعت منصور غبريال (1982). البيئة والسلوك، حوليات كلية الآداب، جامعة الكويت، الحولية رقم (3)
- بين البيئة والسلوك البشري، الطبعة الأولى، الكويت، دار البحوث العلمية على عسكر، محمد الأنصاري (1993). علم النفس البيئي: تفسير نفسي للعلاقة.
- مهنا محمد غنايم (1988) من أساليب التربية البيئية في المضمون المدرسي، ندوة الإنسان والبيئة، مكتب التربية لدول الخليج، ص 76.
- والعلوم، تونس لمراحل التعليم العام في الوطن العربي ، المنظمة العربية للتربية والثقافة محمد صابر سليم، (1988) "المفاهيم الأساسية" مرجع في التعليم البيئي
- الثانوية، رسالة دكتوراه غير منشورة، مودعة مكتبة كلية والمتغيرات النفسية والاجتماعية في السلوك البيئي لدى طلاب المرحلة طارق على محمود على (2002) . أثر الوعي البيئي
بالإسماعيلية، جامعة قناة السويس التربية.
- نظيفة أحمد سرحان (2005). منهاج الخدمة الاجتماعية لحماية البيئة من التلوث، دار الفكر العربي، القاهرة.

Activities and assignments performed by student are to be written inside the auditorium to achieve the objectives of the module.

Example: Reading an article on a subject of a module and summarizing it in English, then translating the summary into Arabic, and finally presenting it to discussion with student's peers.

Dr. Hesham El-Nersh
Assistant Educational Psychology professor
Faculty of Education
Port Said University

Energy and Environment

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
420. Environmental awareness 421. Climate change communication 422. Fairness and climate change justice 423. Future climate change scenarios 424. Strategic planning 425. Integrated assessment 426. Environmental awareness 427. Environmental management 428. Gender and climate	592. Adaptive learning and self-reflection; 593. Awareness and advocacy raising 594. Communicating 595. Contextualising 596. Critical, systemic and futures thinking 597. Debating 598. Discourse 599. Futures thinking 600. Integrated assessment 601. Leadership 602. Local knowledge	689. Accountability 690. Confident 691. Decisive 692. Democratic 693. Empathy 694. Environmental justice 695. Interdependency 696. Openness to novelty and change 697. Optimism 698. Organised 699. Respect and care for the community	100. Discuss the basic terminology and core concepts of energy. 101. Identify the impacts of traditional energy resources on environment. 102. Compare the advantages and disadvantages of different energy resources. 103. Understand the basic principles of production, conversion, storage and transmission of energy. 104. Question the relation between sustainable development and the use of energy resources. 105. Identify the different types of pollution sources. 106. Anticipate possible future environmental change and identify possible development

change 429. Climate change policy 430. Climate change adaptation 431. Risk assessment 432. Climate variability 433. Climate change communication 434. Climate change and health 435. Strategic planning and climate change 436. Role of international institutions	603. Mapping gender impacts 604. Motivate and manage change 605. Networked learning 606. Prioritising 607. Problem solving 608. Resolve ethical dilemmas 609. Scenario analysis and planning 610. Team management	700. Respect for diversity 701. Social cohesion 702. Social responsibility	consequences. 107. Appreciate the positive impacts of utilizing renewable energy resources on the environment. 108. Demonstrate knowledge and understanding of relationship between poverty, environment, climate change, and the insufficient supply of energy. 109. Use the different tools and equipments of pollution measurements. 110. Recognize the availability of solar, wind, hydroelectric and nuclear energy resources in Egypt.

Course Syllabus

Course Number:

Energy and Environment

University of Port Said, Faculty of Science, Department of Environmental Sciences, Fall Semester

Instructor Information

Instructor:
Office Location: Faculty of Science Campus
Telephone: Office –
Office Hours:
E-mail: dsabdelaty@yahoo.com
Website:

Course Identification

Course Number:
Course Name: **energy and environment**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page: www.sci.psu.edu.eg

Course Description/Overview

The present course is intended to raise the students' awareness of energy consumption and environmental pollution. It presents a discussion of the scientific principles of energy and thermodynamics, and the current and future prospects for energy production, conversion, storage and transmission. It also discusses the availability of solar energy, wind energy, hydroelectric energy and nuclear energy. It introduces students to the benefits of using clean energy resources. It does so through tackling the following aspects: 1) environmental pollution energy resources; 2) impact of energy consumption on environment; 3); 4) clean energy resources and climate change; 5) air, thermal and nuclear pollution; and 6) energy consumption, current and future global climate change. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is they are asked to read and summarize articles on renewable energy resources. They are invited to discuss impacts of energy resources on environment at local, national and international scales.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of energy production, conversion, storage and transmission; b) to raise awareness of the learners about the need to explore clean energy resources to achieve the goals of sustainable development; c) help learners use traditional and electronic tools to identify the risks of pollution a result of increasing consumption of petroleum and gas; and d) to highlight the importance of controlling energy resources consumption as clean and safe resources to the environment.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

12. Discuss the basic terminology and core concepts of energy.
13. Identify the impacts of traditional energy resources on environment.
14. Compare the advantages and disadvantages of different energy resources.
15. Understand the basic principles of production, conversion, storage and transmission of energy.

16. Question the relation between sustainable development and the use of energy resources.
17. Identify the different types of pollution sources.
18. Anticipate possible future environmental change and identify possible development consequences.
19. Appreciate the positive impacts of utilizing renewable energy resources on the environment.
20. Demonstrate knowledge and understanding of relationship between poverty, environment, climate change, and the insufficient supply of energy.
21. Use the different tools and equipments of pollution measurements.
22. Recognize the availability of solar, wind, hydroelectric and nuclear energy resources in Egypt.

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Energy Resources and Supply.
3		Renewable energies and clean technologies.
		Solar Energy, solar cells, solar thermal heating systems, and electricity generation.
		Tidal and Hydro as renewable energy resources.
		Renewable Energy Integration and Energy Efficiency in the Built Environment
		Research Design Methods.

Environmental Studies

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
437. Weather and climate 438. Climate change and livelihoods 439. Gender-sensitive response to climate change 440. Climate change communication 441. Fairness and climate change justice 442. Future climate change scenarios 443. Risk assessment	611. Adaptive learning and self-reflection; 612. Awareness and advocacy raising 613. Carbon literacy for procurement 614. Communicating 615. Contextualising 616. Critical, systemic and futures thinking 617. Debating 618. Discourse	703. Accountability 704. Confident 705. Decisive 706. Democratic 707. Empathy 708. Environmental justice 709. Gender-sensitive 710. Global mind-set/ consciousness 711. Interdependency 712. Needs vs. wants	9. Develop an understanding based on observation and illustration, drawn from lived experiences and physical, biological, social and cultural aspects of life, rather than abstractions; 10. Create cognitive capacity and resourcefulness to make the child curious about social phenomena, starting with the family and moving on to wider spaces; 11. Engage the child in exploratory and hands-on activities to acquire basic cognitive and

444. Climate variability 445. Weather and climate 446. Migration & climate change 447. Climate change communication 448. Mainstreaming and planning 449. Spatial decision tools 450. Conflict resolution 451. Occupational health and safety issues 452. Water management and recycling 453. Environmental awareness 454. Environmental management 455. Environmental economics 456. Environmental law 457. Environment and governance 458. Economics and growth 459. Environmental awareness 460. Environmental ethics 461. Role of international	619. Emergency psychology 620. Futures thinking 621. Global dynamics 622. Integrated assessment 623. Leadership 624. Local knowledge 625. Mapping gender impacts 626. Motivate and manage change 627. Networked learning 628. Prioritising 629. Problem solving 630. Resolve ethical dilemmas 631. Scenario analysis and planning 632. Team management	713. Nonviolence & peace 714. Openness to novelty and change 715. Optimism 716. Organised 717. Respect and care for the community 718. Respect for diversity 719. Social cohesion 720. Social responsibility 721. Stewardship 722. Tolerance 723. Transparency 724. Virtue	psychomotor skills through observation, classification, inference, etc.; 12. Critically address gender concerns and issues of marginalisation and oppression with values of equality and justice, and respect for human dignity and rights

institutions			

Course Syllabus

Course Number:

Environmental Studies

University of Port Said, Faculty of Science,
Faculty Requirement

2013-2014

Instructor Information

Instructor: Dr
Office Location: Faculty of Science Campus
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:

Course Name: **Environmental Studies**
Course Location: University Campus
Class Times:
Prerequisites:
Faculty Web Page:

Course Description/Overview

The present course aims to equip students to integrate an understanding of the environment with other academic fields and their personal life. It prepares students for meaningful lifetime engagement with the environmental challenges that are facing society. This course emphasizes active, interdisciplinary learning with the overall objective of instilling the necessary skills to conserve biodiversity and integrate the principles of sustainability with respect to management of complex environmental systems. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is they are asked to read and summarize articles on environmental issues.

Course Learning Objectives

The overarching goals of this course are: a) to develop an awareness about environmental issues; b) to train students to locate and comprehend relationships between the natural, social and cultural environment; and c) nurture the curiosity and creativity of the student particularly in relation to the natural environment (including artifacts and people);

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

13. Develop an understanding based on observation and illustration, drawn from lived experiences and physical, biological, social and cultural aspects of life, rather than abstractions;

14. Create cognitive capacity and resourcefulness to make the child curious about social phenomena, starting with the family and moving on to wider spaces;

15. Engage the child in exploratory and hands-on activities to acquire basic cognitive and psychomotor skills through observation, classification, inference, etc.;

16. Critically address gender concerns and issues of marginalisation and oppression with values of equality and justice, and respect for human dignity and rights

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Environmental definitions and components: aatmosphere, layers, limitations, definitions, characteristics, processes and benefits
3		Air Pollution: Definitions, limitation, causes, types.
4		Hydrosphere: oceans, seas, lakes, rivers and underground water; definitions, limitations, water quality. Water Pollution: definition - major pollutant- sources, transport path, dynamics& treatment.
5		Marine pollution, thermal pollution, radioactive pollution, sewage pollution, heavy metal pollution, pesticides, solid wastes. toxicology, treatments & management.
6		Environmental protection: limitations, methods; monitoring, management & conservation activities. Protected Areas (PAs) & coastal protection. Global climate changes: causes, limitations, worldwide & local; Sea level changes, weather changes; temperature rise, rainfall regime changes, Acid rains & Ocean acidification.

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number:

Environmental Education Anthropology

Port Said University, Faculty of Education, Department of Foundations of Education,

Instructor Information

Instructor: Dr. Mohamed Maher Mahmoud Hanafy

Office Location: Port Said University - Egypt

Telephone: 01224729050

Office Hours:

E-mail: maher_doctor@yahoo.com

Website:

Course Identification

Course Number:

Course Name: Environmental Education Anthropology

Course Location: University Campus
Class Times:
Prerequisites:
Faculty Web Page:

Course Description/Overview

Anthropology is interested in studying human, like other human sciences, which are closely linked to the humanitarian community in which they exist, they reflect its core values prevailing in it, and then help the community improvement and development, the study of environmental and climatic changes has become one of the social sciences and humanities concerns, which including the Anthropology, some of the recent trends in environmental studies, anthropological have been occurred , and these trends study the human adaptive with global environmental changes and developing solutions to many of the environmental problems, and this course shows the nature of the relationship between Anthropology and climate change as the results for man's behavior towards his environment, the course has been divided into five sections: the first section entitled "what is Anthropology," this section deals with the concept of Anthropology, and its objectives, and scope, and its relations to other sciences, the second section entitled "environmental Education", and deals with the concept of environmental education, its goals, and the process of environmental awareness, the third section titled "global climate changes, current and future," it deals with the most important global climate changes, and then the fourth section entitled "The harms of climate changes," it deals with harms of climatic changes and their impact on human health and the physical and natural environment, and finally the fifth section entitled "Mechanisms of the development of environmental awareness

among members of the community" by clarifying the role of formal and informal educational institutions in achieving and reduce environmental harms from climate changes.

Course Learning Objectives

The overarching goals of this course are:
1- Identify the communities cultures and behaviors towards climate changes.
2 Monitor the most important risks of climate changes on the environment and humans.
3 Raise the level of community awareness towards the dangers and harms of climate changes.
4 providing a critical study of the individuals behaviors to various climatic changes.
5. Activating the role of formal and informal educational institutions, in achieving and reduce environmental harms from climate change.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

13. Define the concept of Anthropology and its most important fields and objectives.
14. Clarify the relationship between Anthropology and other sciences.
15. Comparison between the fields of anthropological studies.
16. Show the awareness of global climate changes.
17. Benefit from the programs of educational institutions in modifying the behavior of individuals towards the environment.
18. Develop proposals for how to deal with global climate changes.

Course Resources

Course Website(s)

Required Course Texts and Materials

25. Hassan Mohammed Hassan: Anthropology of Education and the education problems of the big cities, dar althkafa, Cairo, 1980.
26. Mohammed Abbas Ibrahim: The Sub-Culture, dar almearfa algameia, Alexandria 1985.
27. Mohammed El-gohary: anthropology, The Theory Founded and Practical Applications, dar almearfa algameia, Alexandria 0.2005 m.
28. Yahya Badr Morsi Eid: Anthropology Origins, , dar alwafaa, Alexandria , 2007 m.
29. Isa AlShmas: Introduction to Anthropology (Anthropology), the Arab Writers Union, Damascus , 2004 m.
30. Farooq Ahmed Mustafa: Introduction and Antrbeological studies, dar almearfa algameia. Alexandria, 1989 m.
31. Ahmed Hussein ALLaqany and Fareaa Hassan Mohamed: Environmental education , The Duty and the Responsibility, the world of books, Cairo, 1999.
32. Edward Pritchard: Social Anthropology, translation: Ahmed Abu Zaid, the fifth edition, the Egyptian General Book, 1975 m.
33. Assem Shehabi: The Impact of Climate Changes on Human Health, http://www.philadelphia.edu.jo/philadreview/issue5/no5/22.pdf
34. Essam El-Din Hilal : Environmental Education, the Egyptian General Book, Cairo, 2007.
35. Sabri Eldemerdash: environmental education, model, investigation, and Calendar, Knowledge House, Cairo, 1988.
36. Mohammed elsayed Arnaout: human and environmental pollution, Egyptian-Lebanese house, Cairo, 1993.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	40%
Exams	40%
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class

starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

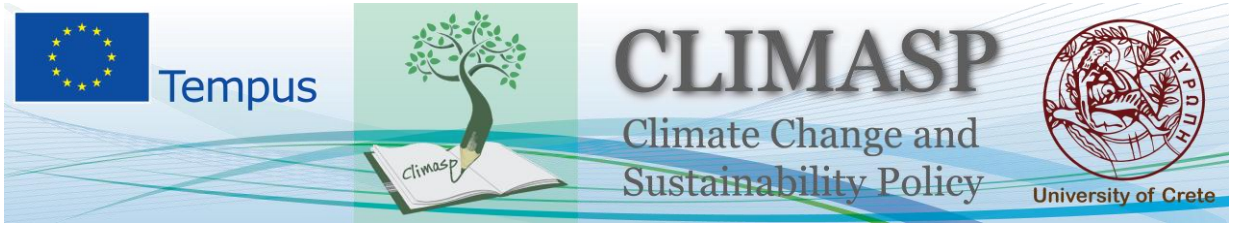
Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		The concept of Anthropology- inception - objectives - fields
3		Relationship between Anthropology and other scienc
4		The concept of environmental education and its goals

5		The Current and Future Global Climate Changes
6		The Harms of Climate Changes on the Natural Environment
7		The Harms of Climate Changes on the physical environment
8		The Harms of Climate Changes on human health
9		The role of formal educational institutions in raising awareness of the climate changes harms and reduce it.
10		The role of informal educational institutions in raising awareness of the climate changes harms and reduce it.
11		The role of technology in reducing the harms of climate changes
12		Activation of social networking sites to modify some of the behaviors that cause climate changes through action or animated videos and other.

APENDIX II: The CLIMASP Course Modules Template Example



Course	**Environmental Education Anthropology**
Module 1	Curriculum: What is Anthropology
Key Concepts	Anthropology and its goals , fields and types
Overview	This Module appears Introduction to Anthropology and its importance in the study of the cultural history of human society, and the most important areas that concerned and its relationship to other sciences.
Aim	The main objective of this Module to know the nature of science Anthropology and its relationship to human behaviors, which is the main reason for the occurrence of climatic changes.
Learning Outcomes	At the end of this module learners will be able to: Identify the concept and the nature of Anthropology.

	Compare between the different areas of anthropology. Clarify the relationship of Anthropology and other sciences.
Units	Unit 1.1 Anthropology (concept, objectives and fields) Unit 1.2: The Relationship between Anthropology and ot sciences.
Readings	Fulya Damla Kentli (2009). Comparison of hidden curriculum theories. European Journal of Educational Studies 1 (2) 83-88. Grundy, S. (1987) *Curriculum: Product or Praxis*, Lewes: Falmer Aristotle (1976) *The Nicomachean Ethics* ('Ethics'), Harmondsworth: Penguin. Chapter 3: Curriculum Theory. http://www.sagepub.com/upm-data/6042_Chapter_3_Glatthorn_(Sage)_I_Proof_2.pdf Watson, D. (2001). Pedagogy before technology: Re-thinking the relationship between ICT and teaching. Education and Information Technologies 6:4, 251–266
Activity	Writing an essay about the role of Anthropology in studying the human culture throughout the ages.
Module 2	Environmental Education

Key Concepts	Environmental Education- population
Overview	This Module appears the nature of environmental education and its most important fields, and objectives, and how to use technology in the preservation of the environment.
Aim	The objective of this Module is knowing the concept of environmental education and its objectives, and to clarify the impact of population activities on the environment, as well as to provide students with some practices associated with environmental education, and how to use technology to preserve them.
Learning Outcomes	• At the end of this module learners will be able to: • Define the concept of environmental education and goals. • Knowing the global efforts towards the preservation of the environment. • Optimize the use of technology to solve environmental problems. • Diagnosis of the current situation of environmental pollution.
Units	Unit 2.1: Environmental Education (concept - targets). Unit 2.2: The role of technology in preserving the environment. Unit 2.3: The global efforts to preserve the environment
Readings	Magdy Aziz Ibrahim: environmental education in the curricula of public education, the Anglo-Egyptian Library, Cairo, 2001.

Activity	**Overview**
	1-View documentary film about how to recycle waste. 2-Implementation workshops on how to recycle waste 3-Conducting field research on the most important aspects of environmental pollution in the local community. 4-Implementation of a forestation campaigns for the local community to reduce air pollution.
Module 3	Climate changes
Key Concepts	Climate changes
Overview	This Module appears the nature of climate changes and the most important forms and causes, and the role of human behavior in its occurrence.
Aim	This module aims at knowing the forms of climate changes and its most important reasons, and the most important international practices relating to the policies of adaptation to

	climate changes and mitigation.
Learning Outcomes	At the end of this module learners will be able to: • Identify the causes of climate changes. • Compare the best international practices on adaptation to climate changes and mitigation.
Units	Unit 3.1: Climate change: forms and causes Unit 3.2: The International practices to adapt to climate change and reduce its impact.
Readings	Abdul Wahab Bin Rajab Hashim bin Sadiq: Environmental Crimes and ways of confrontation, the Center for Studies and Research, Naif Arab University for Security Sciences, Riyadh, 2006.
Activity	Make Atlas illustrates the most important of climate changes forms, its causes and the most affected areas by them.
Module 4	The harms of climate changes
Key Concepts	harms of climate changes
Overview	This Module appears the harms of climate changes on the physical and natural environment and human health, and revenge on the countries' economies and food security.
Aim	The overriding aim of this module is to study the impact of climate changes on human and natural and physical environment.

Learning Outcomes	At the end of this module learners will be able to: • Identify the harms of climate changes. • Educate communities with the climate changes effects
Units	Unit 3.1: The Harm of climate change on human health. Unit 3.2: The Harm of climate change on physical environment Unit 3.3: The Harm of climate change on natural environment
Readings	7- Ahmed Midhat Islam: the problem of environmental pollution era, wrote a series of monthly issued by the National Council for Culture, Arts and Letters, the world of knowledge, Kuwait, 1990. 8- Rachid Salmi: the impact of environmental pollution in economic development in Algeria, Ph.D. thesis, Faculty of Economic Sciences of management, University of Algiers 2006. 9- Mohamed Mahmoud Sergani: liability for environmental damage, a comparative study between international law and Islamic law, Umm Al-Qura University Journal of Educational Sciences, social, humanitarian, first edition, Volume XIII, presses Umm Al Qura University, Mecca, in January 2001
Activity	**Overview**
	Make field research on the most important harms of climate changes

	in the community.
Module 5	Mechanisms for the development of environmental awareness among members of the community
Key Concepts	environmental awareness
Overview	This Module appears the mechanisms development of environmental awareness to members of the community and reduce harms of the climate changes through activating the role of formal educational institutions (schools and universities) and informal (family - the media - civil society organizations).
Aim	The overriding aim of this module is to raise the level of environmental awareness among students is to help them adapt to climate change and the reduction of increasing severity.
Learning Outcomes	At the end of this module learners will be able to: • Define the role of formal and informal educational institutions, in developing the environmental awareness among members of the community. • practice patterns behaviors aimed at adapting to climate change and work on mitigation
Units	Unit 5.1: - The role of formal educational institutions in limiting

	the harms of climate changes. Unit 5.2: The role of informal educational institutions in limiting the harms of climate changes.
Readings	Najib Saab: the environment in the Arab media, the first Arab Media Forum for Environment and Sustainable Development, Cairo, 2006.
Activity	**Overview**
	Designing educational videos shows the harms of climate changes and how to deal with it. Designing Videos emphasizes the rejection of wrong behaviors that cause climate change.

Environmental Microbiology

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
462. Environmental awareness 463. Climate change communication 464. Fairness and climate change justice 465. Future climate change scenarios 466. Technology and innovation 467. Climate change implications for integrated coastal planning 468. Risk assessment 469. Climate variability	633. Adaptive learning and self-reflection; 634. Awareness and advocacy raising 635. Communicating 636. Contextualising 637. Critical, systemic and futures thinking 638. Debating 639. Discourse 640. Futures thinking 641. Integrated assessment 642. Leadership 643. Local knowledge	725. Accountability 726. Confident 727. Decisive 728. Democratic 729. Empathy 730. Environmental justice 731. Openness to novelty and change 732. Optimism 733. Organised 734. Respect and care for the community 735. Respect for diversity	1) Discuss current environmental issues with an understanding of the basic ecological concepts involved. 2) Use an interdisciplinary approach to analyze environmental issues/problems; show knowledge of the interplay between the ecological, political, social, cultural and economic aspects of environmental problems. 3) Develop a worldview related to an understanding of current environmental issues and how global problems affect us locally. 4) Demonstrate an understanding of core ecological principles, and define scientific principles and concepts as related to environmental studies and sustainability.

470. Climate change communication 471. Climate change and health 472. Strategic planning and climate change 473. Role of international institutions 474. Climate change: Science, impacts & scenarios 475. Future climate change scenarios	644. Motivate and manage change 645. Networked learning 646. Prioritising 647. Problem solving 648. Resolve ethical dilemmas 649. Scenario analysis and planning 650. Team management	736. Social responsibility 737. Transparency 738. Sense of urgency 739. Human wellbeing 740. Human rights 741. Social responsibility 742. Perspective 743. Co-responsibility 744. Systematic 745. Focussed	5) Participate in basic field ecology research and experiments according to the scientific method.

Course Syllabus

Course Number:

Environmental Microbiology

Port Said University, Faculty of science, Department of Environmental Sciences,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Environmental Microbiology**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

This course introduces environmental processes and the influence of human activities upon them. Topics include environmental sustainability, ecology and evolution, population growth, natural resources, and a focus on current environmental problems from scientific, social, political, and economic perspectives. Upon completion, students should be able to demonstrate an understanding of environmental interrelationships and of contemporary environmental issues. This course has been approved to satisfy the Comprehensive Articulation Agreement general education core requirement in natural sciences/mathematics.

Course Learning Objectives

The overarching goals of this course are: a) to provide a a broad base of ecosystems biology, environmental microbiology, pollution monitoring, ecotoxicology and environmental biochemistry; b) to raise awareness of the learners about the important aspects of ecosystems and biodiversity, evolution, animal and plant physiology, environmental microbiology and molecular and cellular biology; c) and help learners Prepare for a careers in such field as environmental protection, research, consultancy and ecosystems management.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1) Discuss current environmental issues with an understanding of the basic ecological concepts involved.
2) Use an interdisciplinary approach to analyze environmental issues/problems; show
knowledge of the interplay between the ecological, political, social, cultural and economic aspects of environmental problems.
3) Develop a worldview related to an understanding of current environmental issues and how global problems affect us locally.

4) Demonstrate an understanding of core ecological principles, and define scientific principles and concepts as related to environmental studies and sustainability.
5) Participate in basic field ecology research and experiments according to the scientific method.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		The Biosphere.
3		Environmental Resources
4		Environmental Threats
5		*Environmental Biology and Public Policy*
6		Skills in Biological Investigation and Experimentation

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
37. Environmental awareness 38. Environmental ethics 39. Biodiversity and climate change 40. Climate change adaptation 41. Urbanization's role in climate change 42. Water resources and climate change Social learning processes 43. Water management and recycling	89. Adaptive learning and self-reflection; 90. Awareness and advocacy raising 91. Carbon literacy for procurement 92. Communicating 93. Contextualising 94. Critical, systemic and futures thinking 95. Debating 96. Discourse 97. Emergency psychology 98. Futures thinking 99. Global dynamics 100. Integrated assessment 101. Leadership 102. Local knowledge 103. Mapping gender impacts 104. Motivate and manage change 105. Networked learning 106. Prioritising 107. Problem solving 108. Resolve ethical	89. Accountability 90. Confident 91. Decisive 92. Democratic 93. Empathy 94. Environmental justice 95. Gender-sensitive 96. Global mind-set/ consciousness 97. Interdependency 98. Needs vs. wants 99. Nonviolence & peace 100. Openness to novelty and change 101. Optimism 102. Organised 103. Respect and care for the community 104. Respect for diversity 105. Social cohesion 106. Social responsibility 107. Stewardship 108. Tolerance	53. Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community. 54. Analyse methods of ensuring local participation in climate change adaptation. 55. Analyze the effects of climate change from both male and female perspectives 56. Compare and contrast the impacts of major climatic hazards on livelihoods of the community. 57. Comprehend the significance of the climate change problem locally and globally. 58. Describe the relationship between human activities and climate change. 59. Demonstrate an understanding of the natural carbon cycle. 60. Explore solutions to problems that cause climate change. 61. Identify ways to reduce the school's carbon footprint. 62. Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in. 63. Investigate the causes of climate change. 64. Propose solutions to climate change issues. 65. Understand how human actions are contributing to

	dilemmas 109. Scenario analysis and planning 110. Team management	109. Transparency 110. Virtue	global environmental change.

Course Syllabus

Course Number:

Environmental Sciences

University of Port Said, Faculty of Education, Department of Curricula and Methods of Teaching,

Fall Semester, 2013-2014

Instructor Information

Instructor: Dr Mahmoud Mohasseb

Office Location: Faculty of Education Campus

Telephone: Office –

Office Hours: Tuesday 14.30- 17.00, Wednsday 14.00 – 16.00

E-mail:

Website:

Course Identification

Course Number: **Γ0**

Course Name: **Environmental Sciences**

Course Location: University Campus

Class Times: Wednesday 8:30pm – 11:30am

Prerequisites:
Faculty Web Page:

Course Description/Overview

Education can be the catalyst for empowering students to become critical, reflective and active citizens. Teachers have the potential to be what Giroux and McLaren described as transformative intellectuals who combine scholarly reflection and practice in the service of educating students to be thoughtful, active citizens. The present course is intended to raise the students' environmental awareness. It introduces them to the environmental challenges resulting from climate change. It does so through tackling the following logically sequenced seven issues: 1) Environmental awareness; 2)Environmental ethics; 3) Biodiversity and climate change; 4) Climate change adaptation; 5) Urbanization's role in climate change; 6) Water resources and climate change Social learning processes; and 7) Water management and recycling. Issues 5-7 are, however, deeply covered through active participation of the students. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is, they are asked to read and summarize articles on climate changes. They are invited to discuss scenarios for the management of water resources at local, national and international scales. In short, the course provides an appropriate chance for the students practice their role as future citizens.

Course Learning Objectives

The overarching goals of this course are: a) to provide a critical approach to the negative environmental consequences of climate changes – at local, national and international scales - in the context of education for sustainability; b) raise awareness of the role of the learners to reflect critically on the rights, roles and responsibilities of an active citizen in preparing for the management of critical environmental issues; and c) use traditional and electronic resources as well as social networking technologies as tools to help the community, including children, identify risks and develop climate change adaptation strategies.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

- Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community.
- Analyse methods of ensuring local participation in climate change adaptation.
- Analyze the effects of climate change from both male and female perspectives
- Compare and contrast the impacts of major climatic hazards on livelihoods of the community.
- Comprehend the significance of the climate change problem locally and globally.
- Describe the relationship between human activities and climate change.
- Demonstrate an understanding of the natural carbon cycle.
- Explore solutions to problems that cause climate change.
- Identify ways to reduce the school's carbon footprint.
- Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in.
- Investigate the causes of climate change.
- Propose solutions to climate change issues.
- Understand how human actions are contributing to global environmental change. Course Resources

Course Website(s)

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class
- Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness &id=7141986**
- **Paul Pojman** Environmental Ethics: Readings in Theory and Application Paperback – January 1, 2007
- Oxford Dictionary of Philosophy: environmental ethics, **http://www.answers**. com/topic/environmental-ethics
- Shah, Anup. "Biodiversity." *Global Issues*. 19 Jan. 2014. Web. 10 Sep. 2014. <http://www.globalissues.org/issue/169/biodiversity>.
- Doucet, C. (2007) *Urban Meltdown: Cities, Climate Change and Politics as Usual*, New Society Publishers, Gabriola Island BC.
- Dow, K. and Downing, T. (2006) *The Atlas of Climate Change: Mapping the World's Greatest Challenge*, University of California Press, Berkeley.
- Flannery, T. (2005) *The Weather Makers: How Man is Changing the Climate and What It Means for Life on Earth*, Atlantic Monthly Press NY.
- Hansen, J. (2010) *Storms of My Grandchildren: The Truth about the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, Bloomsbury, New York.
- Henson, R. (2008) *The Gough Guide to Climate Change: The Symptoms, The Science, The Solutions*, Rough Guides, London.
- Holper, P. and Torok, S. (2008) *Climate Change: What You Can do about It at Work, at Home, at School*, Pan Macmillan,Sydney.
- Hulme, M. (2009) *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*, Cambridge University Press, Cambridge.
- Johansen, B. (2006) *Global Warming in the Twenty-First Century*, Praeger Publishers, Westport CT.
- Moser, S. and Dilling, L. (eds) (2007) *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*, Cambridge University Press, Cambridge.

- United Nations Development Programme (2007) *Fighting Climate Change: Human Solidarity in a Divided World: Human Development Report 2007-2008*, Palgrave Macmillan, Basingstoke, UK.
- *Layperson's Guide to Water Recycling and Reuse*, published in 1992 by the Water Education Foundation, Sacramento, California.
- Video, entitled *Water from Water: Recycling*, produced in 1995 by National Water Research Institute, Fountain Valley, California.
- Research On Recycled Water is done by EPA through the Office of Research and Development.
- Water Recycling and Reuse: The Environmental Benefits http://www.epa. gov/region9/water/recycling/
- CCSP (2008). *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Backlund, P., A. Janetos, D. Schimel, J. Hatfield, K. Boote, P. Fay, L. Hahn, C. Izaurralde, B.A. Kimball, T. Mader, J. Morgan, D. Ort, W. Polley, A. Thomson, D. Wolfe, M. Ryan, S. Archer, R. Birdsey, C. Dahm, L. Heath, J. Hicke, D. Hollinger, T. Huxman, G. Okin, R. Oren, J. Randerson, W. Schlesinger, D. Lettenmaier, D. Major, L. Poff, S. Running, L. Hansen, D. Inouye, B.P. Kelly, L Meyerson, B. Peterson, and R. Shaw. U.S. Environmental Protection Agency, Washington, DC, USA.
- Kundzewicz, Z.W., L.J. Mata, N.W. Arnell, P. Döll, P. Kabat, B. Jiménez, K.A. Miller, T. Oki, Z. Sen, and I.A. Shiklomanov (2007). Freshwater resources and their management. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability* . EXIT Disclaimer *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds.)]. Cambridge University Press, Cambridge, United Kingdom.
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Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
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This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

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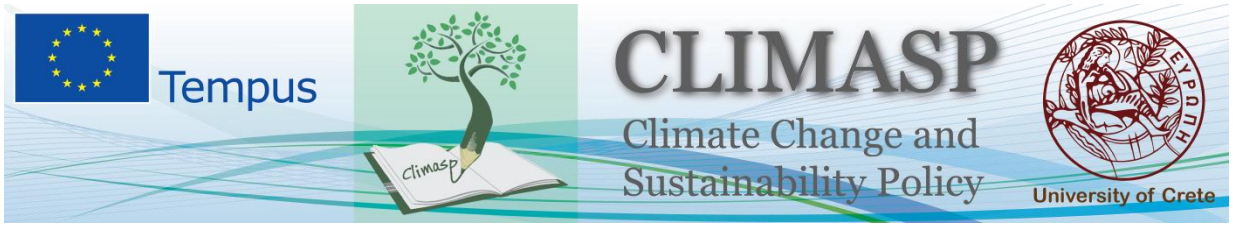
Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Environmental awareness
3		Environmental ethics
4		Biodiversity and climate change
5		Climate change adaptation
6		Urbanization's role in climate change
7		Water resources and climate change Social learning processes (FORUM 1)
8		Water resources and climate change Social learning processes (FORUM 2)
9		Water resources and climate change Social learning processes (FORUM 3)
10-15		Water management and recycling (concepts, feasibility and consequences, techniques, national and international models)

Course Modules



Course	Environmental Sciences
Module 1	Environment: Ethics and Awareness
Key Concepts	Environmental awareness, Environmental ethics
Overview	Environmental awareness is to understand the fragility of our environment and the importance of its protection. Promoting environmental awareness is an easy way to become an environmental steward and participate in creating a brighter future for our children. To define environmental awareness we must first understand the environmentalist movement. Environmentalism is an ideology that evokes the necessity and responsibility of humans to respect, protect, and preserve the natural world from its anthropogenic (caused by humans) afflictions. Environmental awareness is an integral part of the movement's success. By teaching our students, friends and family that the physical environment is fragile and indispensable. Students need to start fixing the problems that threaten it. Environmental ethics, on the other hand, is the part of environmental philosophy which considers extending the traditional boundaries of ethics from solely including humans to including the non-human world. It exerts influence on a large range of disciplines including environmental law, environmental sociology, ecotheology, ecological economics, ecology and geography. There are many ethical decisions that human beings make with respect to the environment. Throughout this module, students are invited to share and

	exchange ideas about issues related to : clear cut forests for the sake of human consumption, propagation of species, gasoline powered vehicles, etc.
Aim	The overriding aim of this module is to turn students able to discourse how human actions are contributing to global environmental change.
Learning Outcomes	At the end of this module learners will be able to: • Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community. • understand how human actions are contributing to global environmental change.
Units	Unit 1.1: Environmental awareness Unit 1.2: Environmental ethics
Readings	• Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness&id=7141986** • **Paul Pojman** Environmental Ethics: Readings in Theory and Application Paperback – January 1, 2007 • Oxford Dictionary of Philosophy: environmental ethics, **http://www.answers**. com/topic/environmental-ethics
Activity	**Overview** Assignment 1.1: Reflecting Upon the following issues: • clear cut forests for the sake of human consumption. • propagating our species, and life itself. • make gasoline powered vehicles. • environmental obligations needed to keep for future generations. • the extinction of a species for the convenience of humanity. • Methods for best use and conserve of the space environment to secure and expand life.

Module 2	Biodiversity and Climate Change
Key Concepts	Biodiversity, Climate, Climate Change
Overview	In the atmosphere, gases such as water vapour, carbon dioxide, ozone, and methane act like the glass roof of a greenhouse by trapping heat and warming the planet. These gases are called greenhouse gases. The natural levels of these gases are being supplemented by emissions resulting from human activities, such as the burning of fossil fuels, farming activities and land-use changes. As a result, the Earth's surface and lower atmosphere are warming, and this rise in temperature is accompanied by many other changes. Rising levels of greenhouse gases are already changing the climate. These changes are affecting the entire world, from low-lying islands in the tropics to the vast polar regions. Also, Climate change affects biodiversity. It becomes one of the most significant drivers of biodiversity loss by the end of the century. It is already forcing biodiversity to adapt either through shifting habitat, changing life cycles, or the development of new physical traits. In this module, students need to realize that, conserving natural terrestrial, freshwater and marine ecosystems and restoring degraded ecosystems (including their genetic and species diversity) is essential for human well-being. Biodiversity can support efforts to reduce the negative effects of climate change. Conserved or restored habitats can remove carbon dioxide from the atmosphere, thus helping to address climate change by storing carbon (for example,reducing emissions from deforestation and forest degradation). Moreover, conserving in-tact ecosystems, such as mangroves, for example, can help reduce the disastrous impacts of climate change such as flooding and storm surges.
Aim	The overriding aim of this module is to realize the interrelationship between biodiversity and climate change
Learning Outcomes	Students will be able to:

	• Analyse methods of ensuring local participation in climate change adaptation. • Analyze the effects of climate change from both male and female perspectives
Units	Unit 2.1: Biodiversity, Climate, Unit 2.2: Climate Change Unit 2.3: Climate Change Adaptation
Readings	Shah, Anup. "Biodiversity." *Global Issues*. 19 Jan. 2014. Web. 10 Sep. 2014. <http://www.globalissues.org/issue/169/biodiversity>. • Doucet, C. (2007) *Urban Meltdown: Cities, Climate Change and Politics as Usual*, New Society Publishers, Gabriola Island BC. • Dow, K. and Downing, T. (2006) *The Atlas of Climate Change: Mapping the World's Greatest Challenge*, University of California Press, Berkeley. • Flannery, T. (2005) *The Weather Makers: How Man is Changing the Climate and What It Means for Life on Earth*, Atlantic Monthly Press NY. • Hansen, J. (2010) *Storms of My Grandchildren: The Truth about the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, Bloomsbury, New York. • Henson, R. (2008) *The Gough Guide to Climate Change: The Symptoms, The Science, The Solutions*, Rough Guides, London.
Activity	**Overview**
	Work in group to: - Collect information on biodiversity in your local environment. - Collect evidence on the effects of climate change on biodiversity in your local environment during the last fifty years. - Propose a strategy to protect biodiversity in your local environment.

Module 3	**Urbanization and Climate Change**
Key Concepts	Urbanization
Overview	This Module deals with the implications of population growth and urbanization for climate change in terms of the contribution of urban populations (and centres) to human induced climate change. It emphasizes how it is not the growth in (urban or rural) population but the growth in consumption that drives the growth in greenhouse gas emissions and that a significant proportion of the world's urban (and rural) population have consumption levels that are so low that they contribute little or nothing to such emissions. In this module students discuss how in the much-needed planning for global emissions reduction, provisions must be made to allow low-income low-consumption households with greenhouse gas emissions below the 'fair-share' level to increase their consumption.
Aim	This module aims at examining the relationship between urbanization and climate change.
Learning Outcomes	At the end of this module learners will be able to: • Describe the relationship between human activities and climate change. • Demonstrate an understanding of the natural carbon cycle.
Units	Unit 3.1: Urbanization *Unit 3.2: Urbanization a Mixed Blessing* Unit 3.3: Urbanization and Climate Change
Readings	• David Satterthwaite The implications of population growth and urbanization for climate change, Paper presented at Expert-Group Meeting on Population Dynamics and Climate Change, UNFPA and IIED In Collaboration with UN-HABITAT and the Population Division, UN/DESA 24 to 25 June 2009 • Holper, P. and Torok, S. (2008) *Climate Change: What You Can do about It at Work, at Home, at School*, Pan Macmillan,Sydney.

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Activity	**Overview**
	Assignment : Prepare a lecture either of following themes 9. Urbanization: cons and pros 10. Urbanization and Carbon Cycle
Module 4	Water Resources and Climate Change
Key Concepts	Water resources management, Social learning processes
Overview	Water resources are important to both society and ecosystems. We depend on a reliable, clean supply of drinking water to sustain our health. We also need water for agriculture, energy production, navigation, recreation, and manufacturing. Many of these uses put pressure on water resources, stresses that are likely to be exacerbated by climate change. In many areas, climate change is likely to increasewater demand while shrinking water supplies. This shifting balance would challenge water managers to simultaneously meet the needs of growing communities, sensitive ecosystems, farmers, ranchers, energy producers, and manufacturers. In this module need to realize that in some areas, water shortages will be less of a problem than increases in runoff, flooding, or sea level rise. These effects can reduce the quality of water and can damage the infrastructure that we use to transport and deliver water.

Aim	The overriding aim of this module is realize the interrelationship between water resources management and climate change
Learning Outcomes	At the end of this module learners will be able to: • Compare and contrast the impacts of major climatic hazards on livelihoods of the community. • Comprehend the significance of the climate change problem locally and globally. • Explore solutions to problems that cause climate change.
Units	Unit 4.1: Water Resources and Climate Change Unit 4.2: Climate change Social learning processes
Readings	• CCSP (2008). *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States*. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Backlund, P., A. Janetos, D. Schimel, J. Hatfield, K. Boote, P. Fay, L. Hahn, C. Izaurralde, B.A. Kimball, T. Mader, J. Morgan, D. Ort, W. Polley, A. Thomson, D. Wolfe, M. Ryan, S. Archer, R. Birdsey, C. Dahm, L. Heath, J. Hicke, D. Hollinger, T. Huxman, G. Okin, R. Oren, J. Randerson, W. Schlesinger, D. Lettenmaier, D. Major, L. Poff, S. Running, L. Hansen, D. Inouye, B.P. Kelly, L Meyerson, B. Peterson, and R. Shaw. U.S. Environmental Protection Agency, Washington, DC, USA. • Kundzewicz, Z.W., L.J. Mata, N.W. Arnell, P. Döll, P. Kabat, B. Jiménez, K.A. Miller, T. Oki, Z. Sen, and I.A. Shiklomanov (2007). Freshwater resources and their management. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability*. EXIT Disclaimer *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds.)]. Cambridge University Press, Cambridge,

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Activity	**Overview**
	• **Assignment**: plan a seminar on major climatic hazards on livelihoods of the community comparing the problems of water shortages and those of water increases
Module 5	**Water Management and Recycling**
Key Concepts	Water management and recycling processes, techniques
Overview	Water cycle is a delicate balance of precipitation, evaporation, and all of the steps in between. Warmer temperatures increase the rate of evaporation of water into the atmosphere, in effect increasing the atmosphere's capacity to "hold" water. Increased evaporation may dry out some areas and fall as excess precipitation on other areas. Changes in the amount of rain falling during storms provide evidence that the water cycle is already changing. Rising temperatures cause snow to begin melting earlier in the year. This alters the timing of stream flow in rivers that have their sources in mountainous areas. As temperatures rise, people and animals need more water to maintain their health and thrive. Many important economic activities, like producing energy at

	power plants, raising livestock, and growing food crops, also require water. The amount of water available for these activities may be reduced as Earth warms, and if competition for water resources increases.
Aim	The overriding aim of this module is to equip students with the capacity to debate on water management and recycling processes, techniques and feasibility>
Learning Outcomes	At the end of this module learners will be able to: • Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in. • Investigate the causes of climate change. • Propose solutions to climate change issues.
Units	Unit 5.1: Water management (concepts; national and international models) Unit 5.2: Water recycling techniques feasibility and consequences
Readings	• United Nations Development Programme (2007) *Fighting Climate Change: Human Solidarity in a Divided World: Human Development Report 2007-2008*, Palgrave Macmillan, Basingstoke, UK. • *Layperson's Guide to Water Recycling and Reuse*, published in 1992 by the Water Education Foundation, Sacramento, California. • Video, entitled *Water from Water: Recycling*, produced in 1995 by National Water Research Institute, Fountain Valley, California. • Research On Recycled Water is done by EPA through the Office of Research and Development. • Water Recycling and Reuse: The Environmental Benefits http://www.epa. gov/region9/water/recycling/
Activity	**Overview**

	Students are to plan and implement three-sessions workshop on the following themes: • Water management (concepts; national and international models) • Water recycling techniques feasibility and consequences

Environmental Sciences

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
44. Environmental awareness 45. Environmental ethics 46. Biodiversity and climate change 47. Climate change adaptation 48. Urbanization's role in climate change 49. Water resources and climate change Social learning processes 50. Water management and recycling	111. Adaptive learning and self-reflection; 112. Awareness and advocacy raising 113. Carbon literacy for procurement 114. Communicating 115. Contextualising 116. Critical, systemic and futures thinking 117. Debating 118. Discourse 119. Emergency psychology 120. Futures thinking 121. Global dynamics	111. Accountability 112. Confident 113. Decisive 114. Democratic 115. Empathy 116. Environmental justice 117. Gender-sensitive 118. Global mind-set/ consciousness 119. Interdependency 120. Needs vs. wants 121. Nonviolence & peace 122. Openness to	66. Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community. 67. Analyse methods of ensuring local participation in climate change adaptation. 68. Analyze the effects of climate change from both male and female perspectives 69. Compare and contrast the impacts of major climatic hazards on livelihoods of the community. 70. Comprehend the significance of the climate change problem locally and globally. 71. Describe the relationship between human activities and climate change. 72. Demonstrate an understanding of the natural carbon

	122. Integrated assessment 123. Leadership 124. Local knowledge 125. Mapping gender impacts 126. Motivate and manage change 127. Networked learning 128. Prioritising 129. Problem solving 130. Resolve ethical dilemmas 131. Scenario analysis and planning 132. Team management	novelty and change 123. Optimism 124. Organised 125. Respect and care for the community 126. Respect for diversity 127. Social cohesion 128. Social responsibility 129. Stewardship 130. Tolerance 131. Transparency 132. Virtue	cycle. 73. Explore solutions to problems that cause climate change. 74. Identify ways to reduce the school's carbon footprint. 75. Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in. 76. Investigate the causes of climate change. 77. Propose solutions to climate change issues. 78. Understand how human actions are contributing to global environmental change.

Course Syllabus

Course Number:

Environmental Sciences

University of Port Said, Faculty of Education, Department of Curricula and Methods of Teaching,

Fall Semester, 2013-2014

Instructor Information

Instructor: Dr Mahmoud Mohasseb

Office Location: Faculty of Education Campus

Telephone: Office –

Office Hours: Tuesday 14.30- 17.00, Wednsday 14.00 – 16.00

E-mail:

Website:

Course Identification

Course Number: **Γ0**

Course Name: **Environmental Sciences**

Course Location: University Campus

Class Times: Wednesday 8:30pm – 11:30am

Prerequisites:
Faculty Web Page:

Course Description/Overview

Education can be the catalyst for empowering students to become critical, reflective and active citizens. Teachers have the potential to be what Giroux and McLaren described as transformative intellectuals who combine scholarly reflection and practice in the service of educating students to be thoughtful, active citizens. The present course is intended to raise the students' environmental awareness. It introduces them to the environmental challenges resulting from climate change. It does so through tackling the following logically sequenced seven issues: 1) Environmental awareness; 2)Environmental ethics; 3) Biodiversity and climate change; 4) Climate change adaptation; 5) Urbanization's role in climate change; 6) Water resources and climate change Social learning processes; and 7) Water management and recycling. Issues 5-7 are, however, deeply covered through active participation of the students. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is, they are asked to read and summarize articles on climate changes. They are invited to discuss scenarios for the management of water resources at local, national and international scales. In short, the course provides an appropriate chance for the students practice their role as future citizens.

Course Learning Objectives

The overarching goals of this course are: a) to provide a critical approach to the negative environmental consequences of climate changes – at local, national and international scales - in the context of education for sustainability; b) raise awareness of the role of the learners to reflect critically on the rights, roles and responsibilities of an active citizen in preparing for the management of critical environmental issues; and c) use traditional and electronic resources as well as social networking technologies as tools to help the community, including children, identify risks and develop climate change adaptation strategies.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

- Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community.
- Analyse methods of ensuring local participation in climate change adaptation.
- Analyze the effects of climate change from both male and female perspectives
- Compare and contrast the impacts of major climatic hazards on livelihoods of the community.
- Comprehend the significance of the climate change problem locally and globally.
- Describe the relationship between human activities and climate change.
- Demonstrate an understanding of the natural carbon cycle.
- Explore solutions to problems that cause climate change.
- Identify ways to reduce the school's carbon footprint.
- Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in.
- Investigate the causes of climate change.
- Propose solutions to climate change issues.
- Understand how human actions are contributing to global environmental change. Course Resources

Course Website(s)

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class
- Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness &id=7141986**
- **Paul Pojman** Environmental Ethics: Readings in Theory and Application Paperback – January 1, 2007
- Oxford Dictionary of Philosophy: environmental ethics, **http://www.answers**. com/topic/environmental-ethics
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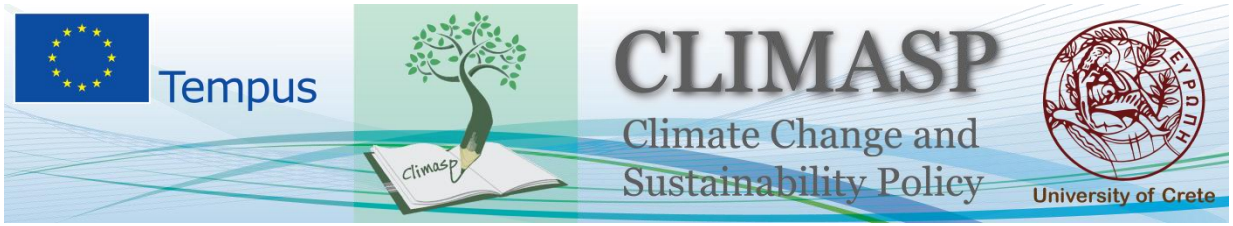
9		Water resources and climate change Social learning processes (FORUM 3)
10-15		Water management and recycling (concepts, feasibility and consequences, techniques, national and international models)

Course Modules



Course	Environmental Sciences
Module 1	Environment: Ethics and Awareness
Key Concepts	Environmental awareness, Environmental ethics
Overview	Environmental awareness is to understand the fragility of our environment and the importance of its protection. Promoting environmental awareness is an easy way to become an environmental steward and participate in creating a brighter future for our children. To define environmental awareness we must first understand the environmentalist movement. Environmentalism is an ideology that evokes the necessity and responsibility of humans to respect, protect, and preserve the natural world from its anthropogenic (caused by humans) afflictions. Environmental awareness is an integral part of the movement's success. By teaching our students, friends and family that the physical environment is fragile and indispensable. Students need to start fixing the problems that threaten it. Environmental ethics, on the other hand, is the part of environmental philosophy which considers extending the traditional boundaries of ethics from solely including humans to including the non-human world. It exerts influence on a large range of disciplines including environmental law, environmental sociology, ecotheology, ecological economics, ecology and geography. There are many ethical decisions that human beings make with respect to the environment. Throughout this module, students are invited to share and

	exchange ideas about issues related to : clear cut forests for the sake of human consumption, propagation of species, gasoline powered vehicles, etc.
Aim	The overriding aim of this module is to turn students able to discourse how human actions are contributing to global environmental change.
Learning Outcomes	At the end of this module learners will be able to: • Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community. • understand how human actions are contributing to global environmental change.
Units	Unit 1.1: Environmental awareness Unit 1.2: Environmental ethics
Readings	• Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness&id=7141986** • **Paul Pojman** Environmental Ethics: Readings in Theory and Application Paperback – January 1, 2007 • Oxford Dictionary of Philosophy: environmental ethics, **http://www.answers**. com/topic/environmental-ethics
Activity	**Overview** Assignment 1.1: Reflecting Upon the following issues: • clear cut forests for the sake of human consumption. • propagating our species, and life itself. • make gasoline powered vehicles. • environmental obligations needed to keep for future generations. • the extinction of a species for the convenience of humanity. • Methods for best use and conserve of the space environment to secure and expand life.

Module 2	Biodiversity and Climate Change
Key Concepts	Biodiversity, Climate, Climate Change
Overview	In the atmosphere, gases such as water vapour, carbon dioxide, ozone, and methane act like the glass roof of a greenhouse by trapping heat and warming the planet. These gases are called greenhouse gases. The natural levels of these gases are being supplemented by emissions resulting from human activities, such as the burning of fossil fuels, farming activities and land-use changes. As a result, the Earth's surface and lower atmosphere are warming, and this rise in temperature is accompanied by many other changes. Rising levels of greenhouse gases are already changing the climate. These changes are affecting the entire world, from low-lying islands in the tropics to the vast polar regions. Also, Climate change affects biodiversity. It becomes one of the most significant drivers of biodiversity loss by the end of the century. It is already forcing biodiversity to adapt either through shifting habitat, changing life cycles, or the development of new physical traits. In this module, students need to realize that, conserving natural terrestrial, freshwater and marine ecosystems and restoring degraded ecosystems (including their genetic and species diversity) is essential for human well-being. Biodiversity can support efforts to reduce the negative effects of climate change. Conserved or restored habitats can remove carbon dioxide from the atmosphere, thus helping to address climate change by storing carbon (for example,reducing emissions from deforestation and forest degradation). Moreover, conserving in-tact ecosystems, such as mangroves, for example, can help reduce the disastrous impacts of climate change such as flooding and storm surges.
Aim	The overriding aim of this module is to realize the interrelationship between biodiversity and climate change
Learning Outcomes	Students will be able to:

	• Analyse methods of ensuring local participation in climate change adaptation. • Analyze the effects of climate change from both male and female perspectives
Units	Unit 2.1: Biodiversity, Climate, Unit 2.2: Climate Change Unit 2.3: Climate Change Adaptation
Readings	Shah, Anup. "Biodiversity." *Global Issues*. 19 Jan. 2014. Web. 10 Sep. 2014. <http://www.globalissues.org/issue/169/biodiversity>. • Doucet, C. (2007) *Urban Meltdown: Cities, Climate Change and Politics as Usual*, New Society Publishers, Gabriola Island BC. • Dow, K. and Downing, T. (2006) *The Atlas of Climate Change: Mapping the World's Greatest Challenge*, University of California Press, Berkeley. • Flannery, T. (2005) *The Weather Makers: How Man is Changing the Climate and What It Means for Life on Earth*, Atlantic Monthly Press NY. • Hansen, J. (2010) *Storms of My Grandchildren: The Truth about the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, Bloomsbury, New York. • Henson, R. (2008) *The Gough Guide to Climate Change: The Symptoms, The Science, The Solutions*, Rough Guides, London.
Activity	**Overview**
	Work in group to: - Collect information on biodiversity in your local environment. - Collect evidence on the effects of climate change on biodiversity in your local environment during the last fifty years. - Propose a strategy to protect biodiversity in your local environment.

Module 3	**Urbanization and Climate Change**
Key Concepts	Urbanization
Overview	This Module deals with the implications of population growth and urbanization for climate change in terms of the contribution of urban populations (and centres) to human induced climate change. It emphasizes how it is not the growth in (urban or rural) population but the growth in consumption that drives the growth in greenhouse gas emissions and that a significant proportion of the world's urban (and rural) population have consumption levels that are so low that they contribute little or nothing to such emissions. In this module students discuss how in the much-needed planning for global emissions reduction, provisions must be made to allow low-income low-consumption households with greenhouse gas emissions below the 'fair-share' level to increase their consumption.
Aim	This module aims at examining the relationship between urbanization and climate change.
Learning Outcomes	At the end of this module learners will be able to: • Describe the relationship between human activities and climate change. • Demonstrate an understanding of the natural carbon cycle.
Units	Unit 3.1: Urbanization *Unit 3.2: Urbanization a Mixed Blessing* Unit 3.3: Urbanization and Climate Change
Readings	• David Satterthwaite The implications of population growth and urbanization for climate change, Paper presented at Expert-Group Meeting on Population Dynamics and Climate Change, UNFPA and IIED In Collaboration with UN-HABITAT and the Population Division, UN/DESA 24 to 25 June 2009 • Holper, P. and Torok, S. (2008) *Climate Change: What You Can do about It at Work, at Home, at School*, Pan Macmillan,Sydney.

	• Hulme, M. (2009) *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*, Cambridge University Press, Cambridge. • Johansen, B. (2006) *Global Warming in the Twenty-First Century*, Praeger Publishers, Westport CT. • Moser, S. and Dilling, L. (eds) (2007) *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*, Cambridge University Press, Cambridge.
Activity	**Overview**
	Assignment : Prepare a lecture either of following themes 11. Urbanization: cons and pros 12. Urbanization and Carbon Cycle
Module 4	Water Resources and Climate Change
Key Concepts	Water resources management, Social learning processes
Overview	Water resources are important to both society and ecosystems. We depend on a reliable, clean supply of drinking water to sustain our health. We also need water for agriculture, energy production, navigation, recreation, and manufacturing. Many of these uses put pressure on water resources, stresses that are likely to be exacerbated by climate change. In many areas, climate change is likely to increasewater demand while shrinking water supplies. This shifting balance would challenge water managers to simultaneously meet the needs of growing communities, sensitive ecosystems, farmers, ranchers, energy producers, and manufacturers. In this module need to realize that in some areas, water shortages will be less of a problem than increases in runoff, flooding, or sea level rise. These effects can reduce the quality of water and can damage the infrastructure that we use to transport and deliver water.

Aim	The overriding aim of this module is realize the interrelationship between water resources management and climate change
Learning Outcomes	At the end of this module learners will be able to: • Compare and contrast the impacts of major climatic hazards on livelihoods of the community. • Comprehend the significance of the climate change problem locally and globally. • Explore solutions to problems that cause climate change.
Units	Unit 4.1: Water Resources and Climate Change Unit 4.2: Climate change Social learning processes
Readings	• CCSP (2008). *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States*. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Backlund, P., A. Janetos, D. Schimel, J. Hatfield, K. Boote, P. Fay, L. Hahn, C. Izaurralde, B.A. Kimball, T. Mader, J. Morgan, D. Ort, W. Polley, A. Thomson, D. Wolfe, M. Ryan, S. Archer, R. Birdsey, C. Dahm, L. Heath, J. Hicke, D. Hollinger, T. Huxman, G. Okin, R. Oren, J. Randerson, W. Schlesinger, D. Lettenmaier, D. Major, L. Poff, S. Running, L. Hansen, D. Inouye, B.P. Kelly, L Meyerson, B. Peterson, and R. Shaw. U.S. Environmental Protection Agency, Washington, DC, USA. • Kundzewicz, Z.W., L.J. Mata, N.W. Arnell, P. Döll, P. Kabat, B. Jiménez, K.A. Miller, T. Oki, Z. Sen, and I.A. Shiklomanov (2007). Freshwater resources and their management. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability*. EXIT Disclaimer *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds.)]. Cambridge University Press, Cambridge,

	United Kingdom. • CCSP (2009). *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Titus, J.G. (Coordinating Lead Author), Anderson, K.E., Cahoon, D.R., Gesch, D.B., Gill, S.K., Gutierrez, B.T., Thieler, E.R., Williams, S.J. (Lead Authors). U.S. Environmental Protection Agency, Washington, DC, USA. • CCSP (2008). *Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Julius, S.H., J.M. West (eds.), J.S. Baron, B. Griffith, L.A. Joyce, P. Kareiva, B.D. Keller, M.A. Palmer, C.H. Peterson, and J.M. Scott (authors). U.S. Environmental Protection Agency, Washington, DC, USA.
Activity	**Overview**
	• **Assignment**: plan a seminar on major climatic hazards on livelihoods of the community comparing the problems of water shortages and those of water increases
Module 5	**Water Management and Recycling**
Key Concepts	Water management and recycling processes, techniques
Overview	Water cycle is a delicate balance of precipitation, evaporation, and all of the steps in between. Warmer temperatures increase the rate of evaporation of water into the atmosphere, in effect increasing the atmosphere's capacity to "hold" water. Increased evaporation may dry out some areas and fall as excess precipitation on other areas. Changes in the amount of rain falling during storms provide evidence that the water cycle is already changing. Rising temperatures cause snow to begin melting earlier in the year. This alters the timing of stream flow in rivers that have their sources in mountainous areas. As temperatures rise, people and animals need more water to maintain their health and thrive. Many important economic activities, like producing energy at

	power plants, raising livestock, and growing food crops, also require water. The amount of water available for these activities may be reduced as Earth warms, and if competition for water resources increases.
Aim	The overriding aim of this module is to equip students with the capacity to debate on water management and recycling processes, techniques and feasibility>
Learning Outcomes	At the end of this module learners will be able to: • Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in. • Investigate the causes of climate change. • Propose solutions to climate change issues.
Units	Unit 5.1: Water management (concepts; national and international models) Unit 5.2: Water recycling techniques feasibility and consequences
Readings	• United Nations Development Programme (2007) *Fighting Climate Change: Human Solidarity in a Divided World: Human Development Report 2007-2008*, Palgrave Macmillan, Basingstoke, UK. • *Layperson's Guide to Water Recycling and Reuse*, published in 1992 by the Water Education Foundation, Sacramento, California. • Video, entitled *Water from Water: Recycling*, produced in 1995 by National Water Research Institute, Fountain Valley, California. • Research On Recycled Water is done by EPA through the Office of Research and Development. • Water Recycling and Reuse: The Environmental Benefits http://www.epa. gov/region9/water/recycling/
Activity	**Overview**

	Students are to plan and implement three-sessions workshop on the following themes: • Water management (concepts; national and international models) • Water recycling techniques feasibility and consequences

Geography of Development

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
476. Environmental awareness 477. Weather and climate 478. Climate change and livelihoods 479. Climate change communication 480. Fairness and climate change justice	651. Adaptive learning and self-reflection; 652. Awareness and advocacy raising 653. Carbon literacy for procurement 654. Contextualising 655. Critical, systemic and futures thinking	746. Accountability 747. Confident 748. Decisive 749. Democratic 750. Empathy 751. Environmental justice 752. Gender-sensitive 753. Global mind-set/	21. Critically assess the role of governments, international agencies, private actors and NGO's with regard to poverty and development. 22. Critically examine the central concepts underlying development theory and relate them to wider issues of how local societies conceive their long-term sustainability and well-being. 23. Identify how debates and concepts in the field of development geography are being translated in

481. Future climate change scenarios 482. Anticipation and monitoring 483. Climate change policy 484. Climate change adaptation 485. Risk assessment 486. Environmental economics 487. Environmental law 488. Environment and governance 489. Economics and growth 490. Environmental awareness 491. GIS: geographic information systems	656. Debating 657. Discourse 658. Futures thinking 659. Global dynamics 660. Integrated assessment 661. Leadership 662. Local knowledge 663. Mapping gender impacts 664. Motivate and manage change 665. Networked learning 666. Prioritising 667. Problem solving 668. Resolve ethical dilemmas 669. Scenario analysis and planning 670. Team management	consciousness 754. Interdependency 755. Nonviolence & peace 756. Openness to novelty and change 757. Optimism 758. Organised 759. Respect and care for the community 760. Respect for diversity 761. Social cohesion 762. Social responsibility 763. Stewardship 764. Tolerance 765. Transparency 766. Virtue	development policies and practice. 24. Discuss certain thematic fields within the human geography of developing countries. 25. Explain the major theories of development and underdevelopment.

Course Syllabus

Course Number:

Geography of Development

University of Port Said, Faculty of Arts, Department of Geography,

2013-2014

Instructor Information

Instructor: Dr
Office Location: Faculty of Arts Campus
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Geography of Development**

Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course provides students with an overview of ideas and themes in development with a particular emphasis on what it means to understand it in terms of geography. It seeks to help students understand both the geographical causes and consequences of varying development. Studies compare More Economically Developed Countries (MEDCs) with Less Economically Developed Countries (LEDCs). Within development geography, sustainable development is also studied in an attempt to understand how to meet the needs of the present without compromising the needs of future generations to meet their own needs. In addition, it explores that 'thinking geographically' about development involves understanding how the meaning of places and regions are socially constructed, and how theoretical and conceptual frameworks about development have been debated. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is they are asked to read and summarize articles on geography of development.

Course Learning Objectives

The overarching goals of this course are: a) to provide a critical approach to the thematic fields within the human geography of developing countries– at local, national and international scales; b) raise awareness of the role of the learners to reflect critically the major theories of development and underdevelopment; and c) use traditional and electronic resources as well as social networking technologies as tools to identify geographical causes and consequences of varying development.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

26. Critically assess the role of governments, international agencies, private actors and NGO's with regard to poverty and development.

27. Critically examine the central concepts underlying development theory and relate them to wider issues of how local societies conceive their long-term sustainability and well-being.
28. Identify how debates and concepts in the field of development geography are being translated in development policies and practice.
29. Discuss certain thematic fields within the human geography of developing countries.
30. Explain the major theories of development and underdevelopment.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		The definition of development, the major theories of development and underdevelopment.
3		The evolution of global inequalities
4		The impacts of population growth and migration, the role of agriculture, industry, and transportation in the development
6		Resource availability and use, pollution of air, water, and biosphere, energy problems.
7		Interactions of humans with plant and animal communities

Geography of Climate

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**

492. Environmental awareness 493. Climate change communication 494. Fairness and climate change justice 495. Future climate change scenarios 496. Technology and innovation 497. Climate change implications for integrated coastal planning 498. Risk assessment 499. Climate variability 500. Climate change communication 501. Climate change and health 502. Strategic planning and climate change 503. Role of international institutions 504. Climate change: Science, impacts & scenarios 505. Future climate change scenarios	671. Adaptive learning and self-reflection; 672. Awareness and advocacy raising 673. Communicating 674. Contextualising 675. Critical, systemic and futures thinking 676. Debating 677. Discourse 678. Futures thinking 679. Integrated assessment 680. Leadership 681. Local knowledge 682. Motivate and manage change 683. Networked learning 684. Prioritising 685. Problem solving 686. Resolve ethical dilemmas 687. Scenario analysis and planning 688. Team management	767. Accountability 768. Confident 769. Decisive 770. Democratic 771. Empathy 772. Environmental justice 773. Openness to novelty and change 774. Optimism 775. Organised 776. Respect and care for the community 777. Respect for diversity 778. Social responsibility 779. Transparency 780. Sense of urgency 781. Human wellbeing 782. Human rights 783. Social responsibility 784. Perspective 785. Co-responsibility 786. Systematic 787. Focussed	1. Identify the geographic distributions of climate processes such as temperature, precipitation, and weather. 2. Explain the processes that determine global climate patterns. 3. Interpret weather maps and data. 4. Analyze the causes and explain the implications of global warming. 5- Identify the elements of the climate and the factors affecting it. 7- Identify the elements of the climate on the maps using the suitable symbols. 8- Discuss the concepts of atmospheric disturbances, hurricanes, and how they occur and geographically spread.

Course Syllabus

Course Number:

Geography of Climate

Port Said University, Faculty of Arts, Department of Geography, Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of Arts
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Geography of Climate**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to provide students with the key concepts about the geography and climate, the important elements of climate and how they are measured and recorded and handled statistically. It also illustrates the importance of the gaseous envelope of the planet and the threats it faces and how protect it. It familiarizes student elements of the climate and the factors affecting it and its geographical distribution and the skillful representation of the elements of the climate on the maps using the suitable symbols. Students are asked to read and summarize articles on elements of the climate. In short, the course provides an appropriate chance for the students to get the minimum knowledge of the climate processes and elements.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of geography of climate ; b) to raise awareness of the learners about elements of the climate and the factors affecting it; c) and help learners use traditional and electronic tools to identify the the elements of the climate on the maps using the suitable symbols.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify the geographic distributions of climate processes such as temperature, precipitation, and weather.
2. Explain the processes that determine global climate patterns.
3. Interpret weather maps and data.
4. Analyze the causes and explain the implications of global warming.
5- Identify the elements of the climate and the factors affecting it.
7- Identify the elements of the climate on the maps using the suitable symbols.
8- Discuss the concepts of atmospheric disturbances, hurricanes, and how they occur and geographically spread.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Introduction of climate science and its relation with the other sciences .
3		The concept of systems and models in weather and climate
4		Elements of climate.
5		*Components and Characteristics* of the Earth's *Atmosphere*
6		Research Design Methods.

Course Syllabus

Course Number:
Human Rights

Port Said University, Faculty of Education, Department of

Instructor Information

Instructor: Dr. Amal Elarabawy Mahdy
Office Location: Faculty of Education, Port Said University - Egypt
Telephone: 01283844779
Office Hours:
E-mail: prof_amal2012@yahoo.com
Website:

Course Identification

Course Number:
Course Name: Human Rights
Course Location: University Campus
Class Times: 24 hours
Prerequisites:
Faculty Web Page:

Course Description/Overview

Though the political thought cared about the Human rights' issue since ever, this care has not reached the nowadays level but recently; only when the Human rights' issue has become an important issue on the international level during the last decade of the twentieth century. The Human rights' issue has been connected to what distinguish man as a man. This can start with ensuring the right of every child in life even before he is born. Then, his rights extend to his care all his life, as he has the right in security, assurance, education, accommodation, health besides his right in political participation and expressing his opinion.

This course is divided into five parts: the first is titled: The Essence of Human Rights. It deals with the concept of human rights, its importance, beginnings, and the human rights and the peoples' rights. The second part is titled: Judiciary and Human Rights. It tackles the role of judiciary in maintaining the human rights, and the types of human rights as well. The third part is: The Procedures of Human Rights. It deals with the procedures of Human Rights on the international, regional and national levels. The fourth is titled: Applications of Human Rights. This one discusses the applications in the fields of medicine, engineering, agriculture and science. The fifth is titled: The Islamic and International Declarations of Human Rights, a comparison between the Islamic and International Declarations of Human Rights.

Course Learning Objectives

The overarching goals of this course are:

15. Recognizing the concept of Human Rights and its importance
16. Defining the types of Human Rights
17. Recognizing the procedures of Human Rights, their beginnings and sources
18. Applying Human Rights' procedures in various fields
19. Discussing the restrictions on Human Rights

20. Learning about the historical development of Human Rights and Democracy
21. Determining the relation between Democracy and Human Rights

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

15. Recognize the Human Rights and their procedures
16. State the Civil, Political, Economic and Social Rights
17. Demonstrate the beginnings, sources and procedures of Human Rights
18. Explain some models of Human Rights' Applications on different levels
19. Analyze the Human Rights' procedures on the international, regional and national levels
20. Analyze the international charters of Human Rights
21. Differentiate between the Human Rights in both the Islamic and Western Civilizations

Course Resources

15. Fadl-ullah Muhammad Isma'eil: Human Rights between the Western Thought and the Islamic, Bustan Elma'refa, Alexandria, 2006.
16. Lotfy Mahmoud Abd El-Haleem: Human Rights Between the United Nations' Declarion and the Holy Qur'an, Dar Almisbah, Cairo, 1992.
17. Muhammad El-Ghazaly: Human Rights between the Islamic Instructions and the United Nations' Declaration, Dar Elkotob Elhaditha, Cairo, 1965.
18. Muhammad Abd El-Ma'boud Morsy and al.: Human Rights Suez Canal University, (University Requirement).
19. Muhammad Fathy Othman: Human Rights between the Islamic Law and the Western Legal Thought, Dar El-Shorouk, Beirut, 1982.

20. Muhammad No'man, Egypt and the Human Rights between Truth and Slander (A Documentary Study), The General Egyptian Book Association , Cairo, 1993
21. Muhammad Salam Zanaty, Human Rights (Historical Introduction), 1992.

Course Website(s)

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	40%
Exams	40%
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Disability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		Human Rights, Concept and Importance
2		Beginnings and Sources of Human Rights
3		Human Rights and Peoples' Rights
4		The Role of judiciary in Maintaining Human Rights
5		Types of Human Rights and the Restrictions on them
6		Human Rights' Procedures on the International Level
7		Human Rights' Procedures on the Regional Level
8		Human Rights' Procedures on the National Level
9		Human Rights' Applications in the field of

		Engineering, Medicine, Agriculture and Science
10		The Islamic Declaration of Human Rights
11		The International Declaration of Human Rights
12		A Comparison Between The Islamic and International Declarations of Human Rights

APENDIX II: The CLIMASP Course Modules Template Example

Course	
Module 1	
Key Concepts	The Essence of Human Rights
Overview	This module tackles the essence of Human Rights and its importance in establishing societies, the beginnings of Human Rights and the most important factors which paved the way for the Human Right Movement within the society.
Aim	The main objective is to identify the concept of Human Rights, its beginning, and the factors which affected it.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Clarify the Human Rights concept, and its importance. • Recognize the historical development of the concept. • Be exposed to the beginning and the sources of Human Rights
Units	• Human Rights: Concept and Importance • The Beginning and sources of Human Rights • Human Rights and Peoples' Rights

Readings	Muhammad Salam Zanaty, Human Rights (Historical Introducti 1992.
Activity	
	Writing an essay about the essence of Human Rights and its importance in establishing societies.
Module 2	
Key Concepts	Judiciary and Human Rights
Overview	This module deals with the role of justiciary in maintaining the Human Rights as every individual has the rights to have an effective legal tool in the national court specialized in the deeds violating the Human Rights given to individuals by judiciary or constitution. People are equal before judiciary, and therefore have equal protection without any discrimination by judiciary.

Aim	The main aim of this module is recognizing the role and importance of judiciary in maintaining Human Rights, and recognizing the rights given to humans.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Recognize the role of judiciary in maintaining Human Rights • Determine types of Human Rights • Discuss the restrictions on Human Rights
Units	5. The Role of judiciary in maintaining Human Rights 6. Human Rights' Types and Restrictions on them
Readings	Lotfy Mahmoud Abd El-Haleem: Human Rights Between the United Nations' Declarion and the Holy Qur'an, Dar Almisbah, Cairo, 1992
Activity	
	Preparing critical researches on some thoughts presented in the content
Module 3	
Key Concepts	Human Rights' Procedures
Overview	This module deals with the procedures necessary for applying the Human Rights within the society as these rights are integrated and no right overwhelms another. Besides, an individual's rights are not separated from the rights of the society. Therefore, procedures are imposed to apply the Human

	Rights.
Aim	The main goal of this module is recognizing the procedures necessary for applying the Human Rights whether on the international, regional or national levels.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Recognize the Procedures of Applying the Human Rights • Analyze the Human Rights' Procedures on the international, regional or national levels.
Units	7. Human Rights' Procedures on the international level. 8. Human Rights' Procedures on the regional level. 9. Human Rights' Procedures on the national level.
Readings	Muhammad No'man Galal, Egypt and the Human Rights between Truth and Slander (A Documentary Study), The General Egyptian Book Association , Cairo, 1993
Activity	Using the Internet in holding a research on the Human Rights' Procedures on the International, Regional and National Levels
Module 4	
Key Concepts	Human Rights' Applications
Overview	This module focuses on how to apply the Human Rights in the field of medicine for maintaining the patient's rights on the physician, in medical treatment, and in sickness confidentiality.

	In the field of Engineering, the application is held by the syndicate commitment to the laborers' rights. In Agriculture, it is guaranteed by the protection of the new plant species, etc. In Science, Human Rights are applied via maintaining copyrights as well as other applications.
Aim	The main goal of this module is recognizing the most important Human Rights' Applications in different fields.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Identify the Human Rights' Applications in different fields. • Suggest procedures to apply the Human Rights' Applications in different fields.
Units	5. Human Rights' Applications in the fields of Medicine and Engineering 6. Human Rights' Applications in the fields of Agriculture and Science
Readings	Muhammad No'man Galal, Egypt and the Human Rights between Truth and Slander (A Documentary Study), The General Egyptian Book Association , Cairo, 1993
Activity	
	Holding civil researches about how to apply Human Rights on different fields
Module 5	

Key Concepts	The Islamic and International Declarations of Human Rights
Overview	
Aim	To recognize human rights in both the Islamic and European Civilizations and to learn about the international charters of human rights
Learning Outcomes	By the end of this module, learners are expected to be able to: • Differentiate between human rights in both the Islamic and European Civilizations • Analyze the international charters of human rights
Units	7. The Islamic Declaration of Human Rights 8. The International Declaration of Human Rights 9. A comparison between the Islamic and International Declarations of Human Rights
Readings	Mohammad No'man Galal, Egypt and Human Rights between Truth and Slander (a documentary study), the Egyptian General Association for Books, Cairo, 1993.
Activity	
	Writing an essay that clarifies the most important principals in the Islamic and International Declarations of Human Rights

Course Syllabus

Course Number:
Human Rights

Port Said University, Faculty of Education, Department of

Instructor Information

Instructor: Dr. Amal Elarabawy Mahdy
Office Location: Faculty of Education, Port Said University - Egypt
Telephone: 01283844779
Office Hours:
E-mail: prof_amal2012@yahoo.com
Website:

Course Identification

Course Number:
Course Name: Human Rights
Course Location: University Campus

Class Times: 24 hours

Prerequisites:

Faculty Web Page:

Course Description/Overview

Though the political thought cared about the Human rights' issue since ever, this care has not reached the nowadays level but recently; only when the Human rights' issue has become an important issue on the international level during the last decade of the twentieth century. The Human rights' issue has been connected to what distinguish man as a man. This can start with ensuring the right of every child in life even before he is born. Then, his rights extend to his care all his life, as he has the right in security, assurance, education, accommodation, health besides his right in political participation and expressing his opinion.

This course is divided into five parts: the first is titled: The Essence of Human Rights. It deals with the concept of human rights, its importance, beginnings, and the human rights and the peoples' rights. The second part is titled: Judiciary and Human Rights. It tackles the role of judiciary in maintaining the human rights, and the types of human rights as well. The third part is: The Procedures of Human Rights. It deals with the procedures of Human Rights on the international, regional and national levels. The fourth is titled: Applications of Human Rights. This one discusses the applications in the fields of medicine, engineering, agriculture and science. The fifth is titled:

The Islamic and International Declarations of Human Rights, a comparison between the Islamic and International Declarations of Human Rights.

Course Learning Objectives

The overarching goals of this course are:

22. Recognizing the concept of Human Rights and its importance
23. Defining the types of Human Rights
24. Recognizing the procedures of Human Rights, their beginnings and sources
25. Applying Human Rights' procedures in various fields
26. Discussing the restrictions on Human Rights
27. Learning about the historical development of Human Rights and Democracy
28. Determining the relation between Democracy and Human Rights

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

22. Recognize the Human Rights and their procedures
23. State the Civil, Political, Economic and Social Rights
24. Demonstrate the beginnings, sources and procedures of Human Rights
25. Explain some models of Human Rights' Applications on different levels
26. Analyze the Human Rights' procedures on the international, regional and national levels
27. Analyze the international charters of Human Rights
28. Differentiate between the Human Rights in both the Islamic and Western Civilizations

Course Resources

22. Fadl-ullah Muhammad Isma'eil: Human Rights between the Western Thought and the Islamic, Bustan Elma'refa, Alexandria, 2006.
23. Lotfy Mahmoud Abd El-Haleem: Human Rights Between the United Nations' Declarion and the Holy Qur'an, Dar Almisbah, Cairo, 1992.
24. Muhammad El-Ghazaly: Human Rights between the Islamic Instructions and the United Nations' Declaration, Dar Elkotob Elhaditha, Cairo, 1965.
25. Muhammad Abd El-Ma'boud Morsy and al.: Human Rights Suez Canal University, (University Requirement).
26. Muhammad Fathy Othman: Human Rights between the Islamic Law and the Western Legal Thought, Dar El-Shorouk, Beirut, 1982.
27. Muhammad No'man, Egypt and the Human Rights between Truth and Slander (A Documentary Study), The General Egyptian Book Association , Cairo, 1993
28. Muhammad Salam Zanaty, Human Rights (Historical Introduction), 1992.

Course Website(s)

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	40%
Exams	40%
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Disability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		Human Rights, Concept and Importance
2		Beginnings and Sources of Human Rights
3		Human Rights and Peoples' Rights
4		The Role of judiciary in Maintaining Human Rights
5		Types of Human Rights and the Restrictions on them
6		Human Rights' Procedures on the International Level

7		Human Rights' Procedures on the Regional Level
8		Human Rights' Procedures on the National Level
9		Human Rights' Applications in the field of Engineering, Medicine, Agriculture and Science
10		The Islamic Declaration of Human Rights
11		The International Declaration of Human Rights
12		A Comparison Between The Islamic and International Declarations of Human Rights

APENDIX II: The CLIMASP Course Modules Template Example

Course	
Module 1	
Key Concepts	The Essence of Human Rights
Overview	This module tackles the essence of Human Rights and its importance in establishing societies, the beginnings of Human Rights and the most important factors which paved the way for the Human Right Movement within the society.
Aim	The main objective is to identify the concept of Human Rights, its beginning, and the factors which affected it.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Clarify the Human Rights concept, and its importance. • Recognize the historical development of the concept. • Be exposed to the beginning and the sources of Human Rights
Units	• Human Rights: Concept and Importance

	• The Beginning and sources of Human Rights • Human Rights and Peoples' Rights
Readings	Muhammad Salam Zanaty, Human Rights (Historical Introducti 1992.
Activity	
	Writing an essay about the essence of Human Rights and its importance in establishing societies.
Module 2	
Key Concepts	Judiciary and Human Rights
Overview	This module deals with the role of justiciary in maintaining the Human Rights as every individual has the rights to have an effective legal tool in the national court specialized in the deeds violating the Human Rights given to individuals by judiciary or constitution.

	People are equal before judiciary, and therefore have equal protection without any discrimination by judiciary.
Aim	The main aim of this module is recognizing the role and importance of judiciary in maintaining Human Rights, and recognizing the rights given to humans.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Recognize the role of judiciary in maintaining Human Rights • Determine types of Human Rights • Discuss the restrictions on Human Rights
Units	7. The Role of judiciary in maintaining Human Rights 8. Human Rights' Types and Restrictions on them
Readings	Lotfy Mahmoud Abd El-Haleem: Human Rights Between the United Nations' Declarion and the Holy Qur'an, Dar Almisbah, Cairo, 1992
Activity	
	Preparing critical researches on some thoughts presented in the content
Module 3	
Key Concepts	Human Rights' Procedures
Overview	This module deals with the procedures necessary for applying the Human Rights within the society as these rights are

	integrated and no right overwhelms another. Besides, an individual's rights are not separated from the rights of the society. Therefore, procedures are imposed to apply the Human Rights.
Aim	The main goal of this module is recognizing the procedures necessary for applying the Human Rights whether on the international, regional or national levels.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Recognize the Procedures of Applying the Human Rights • Analyze the Human Rights' Procedures on the international, regional or national levels.
Units	10. Human Rights' Procedures on the international level. 11. Human Rights' Procedures on the regional level. 12. Human Rights' Procedures on the national level.
Readings	Muhammad No'man Galal, Egypt and the Human Rights between Truth and Slander (A Documentary Study), The General Egyptian Book Association , Cairo, 1993
Activity	Using the Internet in holding a research on the Human Rights' Procedures on the International, Regional and National Levels
Module 4	
Key	Human Rights' Applications

Concepts	
Overview	This module focuses on how to apply the Human Rights in the field of medicine for maintaining the patient's rights on the physician, in medical treatment, and in sickness confidentiality. In the field of Engineering, the application is held by the syndicate commitment to the laborers' rights. In Agriculture, it is guaranteed by the protection of the new plant species, etc. In Science, Human Rights are applied via maintaining copyrights as well as other applications.
Aim	The main goal of this module is recognizing the most important Human Rights' Applications in different fields.
Learning Outcomes	By the end of this module, learners are expected to be able to: • Identify the Human Rights' Applications in different fields. • Suggest procedures to apply the Human Rights' Applications in different fields.
Units	7. Human Rights' Applications in the fields of Medicine and Engineering 8. Human Rights' Applications in the fields of Agriculture and Science
Readings	Muhammad No'man Galal, Egypt and the Human Rights between Truth and Slander (A Documentary Study), The General Egyptian Book Association , Cairo, 1993
Activity	

	Holding civil researches about how to apply Human Rights on different fields
Module 5	
Key Concepts	The Islamic and International Declarations of Human Rights
Overview	
Aim	To recognize human rights in both the Islamic and European Civilizations and to learn about the international charters of human rights
Learning Outcomes	By the end of this module, learners are expected to be able to: • Differentiate between human rights in both the Islamic and European Civilizations • Analyze the international charters of human rights
Units	10. The Islamic Declaration of Human Rights 11. The International Declaration of Human Rights 12. A comparison between the Islamic and International Declarations of Human Rights
Readings	Mohammad No'man Galal, Egypt and Human Rights between Truth and Slander (a documentary study), the Egyptian General Association for Books, Cairo, 1993.
Activity	
	Writing an essay that clarifies the most important principals in the

	Islamic and International Declarations of Human Rights

Hydro geochemistry *and Environment*

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
506. Environmental awareness 507. Climate change communication 508. Fairness and climate change justice 509. Future climate change scenarios 510. Technology and innovation 511. Climate change implications for integrated coastal planning 512. Risk assessment 513. Climate variability	689. Adaptive learning and self-reflection; 690. Awareness and advocacy raising 691. Communicating 692. Contextualising 693. Critical, systemic and futures thinking 694. Debating 695. Discourse 696. Futures thinking 697. Integrated assessment 698. Leadership 699. Local knowledge	788. Accountability 789. Confident 790. Decisive 791. Democratic 792. Empathy 793. Environmental justice 794. Openness to novelty and change 795. Optimism 796. Organised 797. Respect and care for the community 798. Respect for diversity	1. Identify the physical and chemical properties of water. 2. Explain the groundwater origin and genesis, water quality modelling, sources of groundwater pollution,. 3- Discuss weathering and water chemistry. 4- Identify the elements of the climate on the maps using the suitable symbols. 5- Explore the influence of aquifer materials on groundwater quality.

514. Climate change communication 515. Climate change and health 516. Strategic planning and climate change 517. Role of international institutions 518. Climate change: Science, impacts & scenarios 519. Future climate change scenarios	700. Motivate and manage change 701. Networked learning 702. Prioritising 703. Problem solving 704. Resolve ethical dilemmas 705. Scenario analysis and planning 706. Team management	799. Social responsibility 800. Transparency 801. Sense of urgency 802. Human wellbeing 803. Human rights 804. Social responsibility 805. Perspective 806. Co-responsibility 807. Systematic 808. Focussed	

Course Syllabus

Course Number:

Hydro geochemistry *and Environment*

Port Said University, Faculty of science, Department of Environmental Sciences,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of Arts
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Hydro geochemistry and Environment**
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to provide students with the key concepts about physical and chemical properties of water, hydrogeochemical processes, influence of aquifer materials on groundwater quality, representations of results of chemical analyses, groundwater origin and genesis, water quality modelling, sources of groundwater pollution, municipal, agricultural, mining, industrial sources, water treatment, the distribution of biota, nutrients and contaminants in the aquatic environment. Topics will include the hydrologic cycle, the carbonate system and pH control, weathering and water chemistry, redox equilibria, and hydrologic transport.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of hydrogeochemical processes and influence of aquifer materials on groundwater quality; b) to raise awareness of the learners about the need for new sources of water needed for irrigation and drink; c) and help learners to acquire water quality modeling: and d) give the basic understanding of hydrologic cycle, carbonate system, weathering and hydrologic transport

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify the physical and chemical properties of water.
2. Explain the groundwater origin and genesis, water quality modelling, sources of groundwater pollution,.
3- Discuss weathering and water chemistry.
4- Identify the elements of the climate on the maps using the suitable symbols.
5- Explore the influence of aquifer materials on groundwater quality.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Water quality modeling.
3		Groundwater origin and genesis
4		Sources of groundwater pollution.
5		*Components and Characteristics* of the Earth's *Atmosphere*
6		Weathering and water chemistry.

Legislation and the laws of Environmental Management

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
520. Environmental awareness 521. Climate change communication 522. Fairness and climate change justice 523. Technology and innovation 524. Risk assessment 525. Climate change and health 526. Strategic planning and climate change 527. Role of international institutions 528. Future climate change scenarios	707. Adaptive learning and self-reflection; 708. Awareness and advocacy raising 709. Communicating 710. Contextualising 711. Critical, systemic and futures thinking 712. Debating 713. Discourse 714. Futures thinking 715. Integrated assessment 716. Leadership 717. Local knowledge 718. Motivate and manage change 719. Networked learning 720. Prioritising 721. Problem solving 722. Resolve ethical dilemmas 723. Scenario analysis and planning	809. Accountability 810. Confident 811. Decisive 812. Democratic 813. Empathy 814. Environmental justice 815. Openness to novelty and change 816. Optimism 817. Organised 818. Respect and care for the community 819. Respect for diversity 820. Social responsibility 821. Transparency 822. Sense of urgency 823. Human wellbeing 824. Human rights 825. Social responsibility 826. Perspective	Upon successful completion of this course, students will be able to: 1. Identify the issues arising from the impact of industrial and development policies on the natural environment. 2. Explain the limitations of environmental law. 3- Discuss perspectives, actors, institutions, and economic relationships as they relate to global environmental policy. 4- Identify the methods of evaluation in environmental management. 5- Explore the linkages between the global political system and the natural environment.

	724. Team management	827. Co-responsibility 828. Systematic 829. Focussed	

Course Syllabus

Course Number:

Legislation and the Laws of Environmental Management

Port Said University, Faculty of science, Department of Environmental Sciences,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: Legislation and the Laws of Environmental Management
Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to provide students with practical and detailed examination of the enactment, enforcement and limitations of environmental law and policy. The course will 'provide a comprehensive overview of environmental law. It critically explores modes of decision-making in contemporary institutions with special emphasis on methods of evaluation in environmental management. Decision analysis, risk assessment and other techniques of 'scientific' decision/evaluation are studied using both theoretical and case-study approaches. The course focuses on perspectives, actors, institutions, and economic relationships as they relate to global environmental policy.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of environmental law; b) to raise awareness of the learners about the need for new methods of evaluation in environmental management; and c) provide students with a solid understanding of linkages between the global political system and the natural environment

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify the issues arising from the impact of industrial and development policies on the natural environment.
2. Explain the limitations of environmental law.
3- Discuss perspectives, actors, institutions, and economic relationships as they relate to global environmental policy.
4- Identify the methods of evaluation in environmental management..
5- Explore the linkages between the global political system and the natural environment.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Domination of Nature.
3		The ethics of scarcity
4		Animal and environmental rights.
5		social benefit and technological risk, and the debate among deep ecologists
6		Social ecologists and eco-feminists over the care of the earth.

Man and Environment

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
51. Environmental awareness 52. Environmental ethics 53. Biodiversity and climate change 54. Climate change adaptation 55. Urbanization's role in climate change 56. Water resources and climate change Social learning processes 57. Risk assessment 58. Climate change and health 59. Pollution and health 60. Gender and climate change 61. Mitigation of pollution	133. Adaptive learning and self-reflection; 134. Awareness and advocacy raising 135. Carbon literacy for procurement 136. Communicating 137. Contextualising 138. Critical, systemic and futures thinking 139. Debating 140. Discourse 141. Emergency psychology 142. Futures thinking 143. Global dynamics 144. Integrated assessment 145. Leadership 146. Local knowledge 147. Mapping gender impacts 148. Motivate and manage change 149. Networked learning 150. Prioritising 151. Problem solving 152. Resolve ethical	133. Accountability 134. Confident 135. Decisive 136. Democratic 137. Empathy 138. Environmental justice 139. Gender-sensitive 140. Global mind-set/ consciousness 141. Interdependency 142. Needs vs. wants 143. Nonviolence & peace 144. Openness to novelty and change 145. Optimism 146. Organised 147. Respect and care for the community 148. Respect for diversity 149. Social cohesion 150. Social responsibility 151. Stewardship	79. Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community. 80. Analyse methods of ensuring local participation in climate change adaptation. 81. Analyze the effects of climate change from both male and female perspectives 82. Compare and contrast the impacts of major climatic hazards on human health and the community. 83. Comprehend the significance of the climate change problem locally and globally. 84. Describe the relationship between human activities and climate change. 85. Demonstrate an understanding of the effect of pollution on human health 86. Explore solutions to problems that cause climate change. 87. Identify ways to reduce the school's carbon footprint. 88. Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in. 89. Investigate the mitigation of climate change. 90. Propose solutions to climate change issues. 91. Understand how human actions are contributing to

	dilemmas 153. Scenario analysis and planning 154. Team management	152. Tolerance 153. Transparency 154. Virtue	global environmental change.

Course Syllabus

Course Number:

Man and Environment

University of Port Said, Faculty of medicine , Department of Community medicine

Fall Semester, 2013-2014

Instructor Information

Instructor: Prof. EnasElsheikh

Office Location: Faculty of Medicine

Telephone: Office – +20663428168

Office Hours: Tuesday 14.30- 17.00, Wednsday 14.00 – 16.00

E-mail: eelsheikh47@gmail.com

Website:

Course Identification

Course Number: **Γ1**

Course Name: **Man and Environment**

Course Location: Faculty of medicine

Class Times: Wednesday 8:30pm – 11:30am

Prerequisites:
Faculty Web Page: www.psu.edu.eg

Course Description/Overview

Education can be the catalyst for empowering students to become critical, reflective and active citizens. Physician have the potential to be decision maker and practice in the service of educating patients to be active citizens. The present course is intended to raise the students' environmental awareness. It introduces them to the environmental challenges resulting from climate change. It does so through tackling the following logically sequence issues: 1) Environmental awareness; 2)Environmental ethics; 3) Biodiversity and climate change; 4) Climate change adaptation; 5) Urbanization's role in climate change; 6) Water resources and climate change Social learning processes; and 7) natural sources of pollution and man madepollutions 8) air pollution, noise pollution and human activity 9) effect of pollution on health Issues are, however, deeply covered through active participation of the students. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is, they are asked to read and summarize articles on climate changes. They are invited to discuss scenarios for the management of water resources at local, national and international scales. In short, the course provides an appropriate chance for the students practice their role as future citizens.

Course Learning Objectives

The overarching goals of this course are: a) to provide a critical approach to the negative environmental consequences of climate changes – at local, national and international scales -in the context of education for sustainability; b) raise awareness of the role of the learners to reflect critically on the rights, roles and responsibilities of an active citizen in preparing for the management of critical environmental issues; and c) use traditional and electronic resources as well as social networking technologies as tools tohelp the community, including children, identify risks and develop climate change adaptation strategies. d) to raise the awareness of the learner about the need to examine physical, chemical, biological, political and economic dimension of environment

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

- Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community.
- Discuss the basic terminology and core concepts of environment
- Identify the physical chemical biological political and economic dimension of environment
- Conduct survey of environmental system , human interaction
- Analyse methods of ensuring local participation in climate change adaptation.
- Analyze the effects of climate change from both male and female perspectives
- Compare and contrast the impacts of major climatic hazards on human beings and the community.
- Comprehend the significance of the climate change problem locally and globally.
- Describe the relationship between human activities and climate change.
- Describe the relationship between poverty and unsafe environment
- Demonstrate an understanding of the different types of pollutions and its impact on human health
- Explore solutions and mitigation process to problems that cause climate change.
- Identify ways to reduce the impact of climate changes
- Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in.
- Investigate the causes of climate change and pollution
- Propose solutions to climate change issues.
- Understand how human actions are contributing to global environmental change. Course Resources

Course Website(s)

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class
- Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness &id=7141986**
- **Paul Pojman**Environmental Ethics: Readings in Theory and ApplicationPaperback – January 1, 2007
- Oxford Dictionary of Philosophy: environmental ethics,**http://www.answers**.com/topic/environmental-ethics
- Doucet, C. (2007) *Urban Meltdown: Cities, Climate Change and Politics as Usual*, New Society Publishers, Gabriola Island BC.
- Dow, K. and Downing, T. (2006) *The Atlas of Climate Change: Mapping the World's Greatest Challenge*, University of California Press, Berkeley.
- Hansen, J. (2010) *Storms of My Grandchildren: The Truth about the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, Bloomsbury, New York.
- Henson, R. (2008) *The Gough Guide to Climate Change: The Symptoms, The Science, The Solutions*, Rough Guides, London.
- Holper, P. and Torok, S. (2008) *Climate Change: What You Can do about It at Work, at Home, at School*, Pan Macmillan,Sydney.
- Hulme, M. (2009) *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*, Cambridge University Press, Cambridge.
- Johansen, B. (2006) *Global Warming in the Twenty-First Century*, Praeger Publishers, Westport CT.
- CCSP (2008). *Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Julius, S.H., J.M. West (eds.), J.S. Baron, B. Griffith, L.A. Joyce, P. Kareiva, B.D. Keller, M.A. Palmer, C.H. Peterson, and J.M. Scott (authors). U.S. Environmental Protection Agency, Washington, DC, USA.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

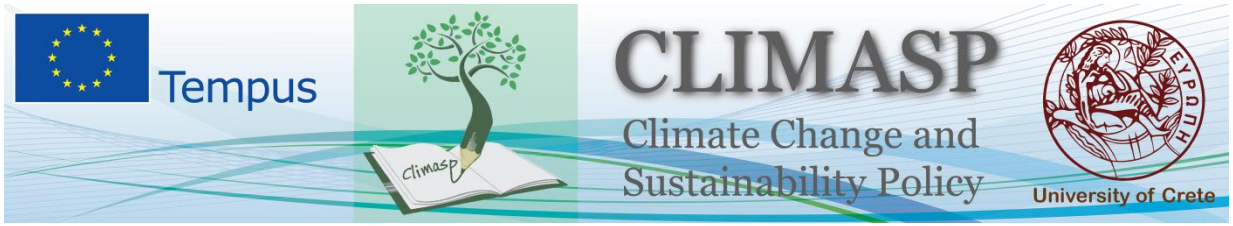
Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Environmental awareness
3		Environmental ethics
4		Biodiversity and climate change /health
5		Climate change adaptation / health
6		Urbanization's role in climate change /health
7		Water resources and climate change Social learning processes (FORUM 1)
8		Air pollution and climate change Social learning processes (FORUM 2)
9		Gender and climate change Social learning processes (FORUM 3)
10-15		Mitigation and health (concepts, feasibility and consequences, techniques, national and international models)

Course Modules



Course	Man and Environment
Module 1	Environment: Ethics and Awareness
Key Concepts	Environmental awareness, Environmental ethics
Overview	Environmental awareness is to understand the fragility of our environment and the importance of its protection. Promoting environmental awareness is an easy way to become an environmental steward and participate in creating a brighter future for our children.To define environmental awareness we must first understand the environmentalist movement. Environmentalism is an ideology that evokes the necessity and responsibility of humans to respect, protect, and preserve the natural world from its anthropogenic (caused by humans) afflictions. Environmental awareness is an integral part of the movement's success. By teaching our students, friends and family that the physical environment is fragile and indispensable. Students need to start fixing the problems that threaten it. Environmental ethics, on the other hand, is the part of environmental philosophy which considers extending the traditional boundaries of ethics from solely including humans to including the non-human world. It exerts influence on a large range of disciplines including environmental law, environmental sociology, ecotheology, ecological economics, ecology and geography. There are many ethical decisions that human beings make with respect to the

	environment. Throughout this module, students are invited to share and exchange ideas about issues related to :clear cut forests for the sake of human consumption, propagation of species, gasoline powered vehicles, etc.
Aim	The overriding aim of this module is to turn students able to discourse how human actions are contributing to global environmental change.
Learning Outcomes	At the end of this module learners will be able to: • Collect, interpret and present information about strategies to confront climate change to a variety of audiences, including other students, parents and the local community. • understand how human actions are contributing to global environmental change.
Units	Unit 1.1:Environmental awareness Unit 1.2: Environmental ethics
Readings	• Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness&id=7141986** • **Paul Pojman**Environmental Ethics: Readings in Theory and ApplicationPaperback – January 1, 2007 • Oxford Dictionary of Philosophy: environmental ethics, **http://www.answers**.com/topic/environmental-ethics
Activity	**Overview** Assignment 1.1: Reflecting Upon the following issues: • clear cut forests for the sake of human consumption. • propagating our species, and life itself. • make gasoline powered vehicles. • environmental obligations needed to keep for future generations. • the extinction of a species for the convenience of humanity. • Methods for best use and conserve of the space environment to secure and

	expand life.
Module 2	Biodiversity and Climate Change
Key Concepts	Biodiversity, Climate, Climate Change
Overview	In the atmosphere, gases such as water vapour, carbon dioxide, ozone, and methane act like the glass roof of a greenhouse by trapping heat and warming the planet. These gases are called greenhouse gases. The natural levels of these gases are being supplemented by emissions resulting from human activities, such as the burning of fossil fuels, farming activities and land-use changes. As a result, the Earth's surface and lower atmosphere are warming, and this rise in temperature is accompanied by many other changes. Rising levels of greenhouse gases are already changing the climate. These changes are affecting the entire world, from low-lying islands in the tropics to the vast polar regions. Also, Climate change affects biodiversity. It becomes one of the most significant drivers of biodiversity loss by the end of the century. It is already forcing biodiversity to adapt either through shifting habitat, changing life cycles, or the development of new physical traits. In this module, students need to realize that, conserving natural terrestrial, freshwater and marine ecosystems and restoring degraded ecosystems (including their genetic and species diversity) is essential for human well-being. Biodiversity can support efforts to reduce the negative effects of climate change. Conserved or restored habitats can remove carbon dioxide from the atmosphere, thus helping to address climate change by storing carbon (for example,reducing emissions from deforestation and forest degradation). Moreover, conserving in-tact ecosystems, such as mangroves, for example, can help reduce the disastrous impacts of climate change such as flooding and storm surges.
Aim	The overriding aim of this module is to realize the interrelationship between biodiversity and climate change

Learning Outcomes	Students will be able to: • Analyse methods of ensuring local participation in climate change adaptation. • Analyze the effects of climate change from both male and female perspectives
Units	Unit 2.1: Biodiversity, Climate, Unit 2.2: Climate Change Unit 2.3: Climate Change Adaptation
Readings	Shah, Anup. "Biodiversity." *Global Issues*. 19 Jan. 2014. Web. 10 Sep. 2014. <http://www.globalissues.org/issue/169/biodiversity>. • Doucet, C. (2007) *Urban Meltdown: Cities, Climate Change and Politics as Usual*, New Society Publishers, Gabriola Island BC. • Dow, K. and Downing, T. (2006) *The Atlas of Climate Change: Mapping the World's Greatest Challenge*, University of California Press, Berkeley. • Flannery, T. (2005) *The Weather Makers: How Man is Changing the Climate and What It Means for Life on Earth*, Atlantic Monthly Press NY. • Hansen, J. (2010) *Storms of My Grandchildren: The Truth about the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, Bloomsbury, New York. • Henson, R. (2008) *The Gough Guide to Climate Change: The Symptoms, The Science, The Solutions*, Rough Guides, London.
Activity	**Overview**
	Work in group to: - Collect information on biodiversity in your local environment. - Collect evidence on the effects of climate changeon biodiversity in your local environment during the last fifty years.

	- Propose a strategy to protect biodiversity in your local environment.
Module 3	**Urbanization and Climate Change**
KeyConcepts	Urbanization
Overview	This Module deals with the implications of population growth and urbanization for climate change in terms of the contribution of urban populations (and centres) to human induced climate change. It emphasizes how it is not the growth in (urban or rural) population but the growth in consumption that drives the growth in greenhouse gas emissions and that a significant proportion of the world's urban (and rural) population have consumption levels that are so low that they contribute little or nothing to such emissions. In this module students discuss how in the much-needed planning for global emissions reduction, provisions must be made to allow low-income low-consumption households with greenhouse gas emissions below the 'fair-share' level to increase their consumption.
Aim	This module aims at examining the relationship between urbanization and climate change.
Learning Outcomes	At the end of this module learners will be able to: • Describe the relationship between human activities and climate change. • Demonstrate an understanding of the natural carbon cycle.
Units	Unit 3.1: Urbanization *Unit 3.2: Urbanization a Mixed Blessing* Unit 3.3: Urbanization and Climate Change
Readings	• David Satterthwaite The implications of population growth and urbanization for climate change, Paper presented at Expert-Group Meeting on Population Dynamics and Climate Change, UNFPA and IIED In Collaboration with UN-HABITAT and the Population Division, UN/DESA 24 to 25 June 2009

	• Holper, P. and Torok, S. (2008) *Climate Change: What You Can do about It at Work, at Home, at School*, Pan Macmillan,Sydney. • Hulme, M. (2009) *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*, Cambridge University Press, Cambridge. • Johansen, B. (2006) *Global Warming in the Twenty-First Century*, Praeger Publishers, Westport CT. • Moser, S. and Dilling, L. (eds) (2007) *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*, Cambridge University Press, Cambridge.
Activity	**Overview**
	Assignment : Prepare a lecture either of following themes 13. Urbanization: cons and pros 14. Urbanization and Carbon Cycle
Module 4	Water Resources and Climate Change
Key Concepts	Water resources management, Social learning processes
Overview	Water resources are important to both society and ecosystems. We depend on a reliable, clean supply of drinking water to sustain our health. We also need water for agriculture, energy production, navigation, recreation, and manufacturing. Many of these uses put pressure on water resources, stresses that are likely to be exacerbated by climate change. In many areas, climate change is likely to increasewater demand while shrinking water supplies. This shifting balance would challenge water managers to simultaneously meet the needs of growing communities, sensitive ecosystems, farmers, ranchers, energy producers, and manufacturers. In this module need to realize that in some areas, water shortages will be less of

	a problem than increases in runoff, flooding, or sea level rise. These effects can reduce the quality of water and can damage the infrastructure that we use to transport and deliver water.
Aim	The overriding aim of this module is realize the interrelationship between water resources management and climate change
Learning Outcomes	At the end of this module learners will be able to: • Compare and contrast the impacts of major climatic hazards on livelihoods of the community. • Comprehend the significance of the climate change problem locally and globally. • Explore solutions to problems that cause climate change.
Units	Unit 4.1: Water Resources and Climate Change Unit 4.2: Climate change Social learning processes
Readings	• CCSP (2008). *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Backlund, P., A. Janetos, D. Schimel, J. Hatfield, K. Boote, P. Fay, L. Hahn, C. Izaurralde, B.A. Kimball, T. Mader, J. Morgan, D. Ort, W. Polley, A. Thomson, D. Wolfe, M. Ryan, S. Archer, R. Birdsey, C. Dahm, L. Heath, J. Hicke, D. Hollinger, T. Huxman, G. Okin, R. Oren, J. Randerson, W. Schlesinger, D. Lettenmaier, D. Major, L. Poff, S. Running, L. Hansen, D. Inouye, B.P. Kelly, L Meyerson, B. Peterson, and R. Shaw. U.S. Environmental Protection Agency, Washington, DC, USA. • Kundzewicz, Z.W., L.J. Mata, N.W. Arnell, P. Döll, P. Kabat, B. Jiménez, K.A. Miller, T. Oki, Z. Sen, and I.A. Shiklomanov (2007). Freshwater resources and their management. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability* . EXIT Disclaimer *Contribution of Working*

	Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds.)]. Cambridge University Press, Cambridge, United Kingdom. • CCSP (2009). *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Titus, J.G. (Coordinating Lead Author), Anderson, K.E., Cahoon, D.R., Gesch, D.B., Gill, S.K., Gutierrez, B.T., Thieler, E.R., Williams, S.J. (Lead Authors). U.S. Environmental Protection Agency, Washington, DC, USA. • CCSP (2008). *Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources* . A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Julius, S.H., J.M. West (eds.), J.S. Baron, B. Griffith, L.A. Joyce, P. Kareiva, B.D. Keller, M.A. Palmer, C.H. Peterson, and J.M. Scott (authors). U.S. Environmental Protection Agency, Washington, DC, USA.
Activity	**Overview**
	• **Assignment**:plan a seminar on major climatic hazards on livelihoods of the community comparingthe problems of water shortages and those of water increases
Module 5	**Water Management and Recycling**
Key Concepts	Water management and recyclingprocesses, techniques
Overview	Water cycle is a delicate balance of precipitation, evaporation, and all of the steps in between. Warmer temperatures increase the rate of evaporation of water into the atmosphere, in effect increasing the atmosphere's capacity to "hold" water.Increased evaporation may dry out some areas and fall as excess precipitation on other areas.Changes in the amount of rain falling during storms provide evidence that the water cycle is already changing. Rising temperatures cause snow to begin melting earlier in the year. This alters the timing of

	streamflow in rivers that have their sources in mountainous areas. As temperatures rise, people and animals need more water to maintain their health and thrive. Many important economic activities, like producing energy at power plants, raising livestock, and growing food crops, also require water. The amount of water available for these activities may be reduced as Earth warms, and if competition for water resources increases.
Aim	The overriding aim of this module is to equip students with the capacity to debate on water management and recycling processes, techniques and feasibility>
Learning Outcomes	At the end of this module learners will be able to: • Interpret information about impacts and vulnerabilities specific to the locality, region or sector students are expected to work in. • Investigate the causes of climate change. • Propose solutions to climate change issues.
Units	Unit 5.1: Water management (concepts; national and international models) Unit 5.2: Water recycling techniques feasibility and consequences
Readings	• United Nations Development Programme (2007) *Fighting Climate Change: Human Solidarity in a Divided World: Human Development Report 2007-2008*, Palgrave Macmillan, Basingstoke, UK. • *Layperson's Guide to Water Recycling and Reuse*, published in 1992 by the Water Education Foundation, Sacramento, California. • Video, entitled *Water from Water: Recycling*, produced in 1995 by National Water Research Institute, Fountain Valley, California. • Research On Recycled Water is done by EPA through the Office of Research and Development. • Water Recycling and Reuse: The Environmental Benefits http://www.epa.gov/region9/water/recycling/

Activity	Overview
	Students are to plan and implement three-sessions workshop on the following themes: • Water management (concepts; national and international models) • Water recycling techniques feasibility and consequences

Remote sensing and geology pictorial

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
529. Environmental awareness 530. Climate change communication 531. Fairness and climate change justice 532. Technology and innovation 533. Risk assessment 534. Climate variability 535. Strategic planning and climate change	725. Adaptive learning and self-reflection; 726. Awareness and advocacy raising 727. Communicating 728. Contextualising 729. Critical, systemic and futures thinking 730. Debating 731. Discourse 732. Futures thinking 733. Integrated assessment	830. Accountability 831. Confident 832. Decisive 833. Democratic 834. Empathy 835. Environmental justice 836. Openness to novelty and change 837. Optimism 838. Organised 839. Respect and care	1. Identify the types of remote sensing. 2. Explain the principles and process of remote sensing. 3- Discuss the different remote sensing systems. 4- Differentiate between the active and passive sensors. 5- Explore the remote sensing platforms.

536. Role of international institutions 537. Climate change: Science, impacts & scenarios	734. Leadership 735. Local knowledge 736. Motivate and manage change 737. Networked learning 738. Prioritising 739. Problem solving 740. Resolve ethical dilemmas 741. Scenario analysis and planning 742. Team management	for the community 840. Respect for diversity 841. Social responsibility 842. Transparency 843. Sense of urgency 844. Human wellbeing 845. Human rights 846. Social responsibility 847. Perspective 848. Co-responsibility 849. Systematic 850. Focussed	

Course Syllabus

Course Number:

Remote sensing and Geology Pictorial

Port Said University, Faculty of science, Department of Environmental Sciences,

Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **remote sensing and geology pictorial**

Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to provide students with the key concepts about the remote sensing, collection of data, sensing devices, evaluation of the collected data, applications of remote sensing techniques in geological purposes, image data processing, image rectification processing, image display and enhancement processing, edge enhancement processing, digital mosaics processing, contrast stretching processing, color composition, principle component analysis (PCA), decorrelation stretch , aerial photography, (elements, airphoto interpretation (instrumentation and procedures), principles of landform identification and evaluation, applications of aerial photographs in geology), earth resources satellites, multispectral scanners, digital image processing, applications of remote sensing and geographic information systems in geology.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of applications of remote sensing techniques in geological purposes; b) to train learners in geographic information systems and remote sensing as applied to geological exploration c) and help learners to

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify the types of remote sensing.
2. Explain the principles and process of remote sensing.
3- Discuss the different remote sensing systems.
4- Differentiate between the active and passive sensors.
5- Explore the remote sensing platforms.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Concept of remote sensing.
3		Sensor on the ground, in the air and in the space
4		Elements of climate.
5		Types of remote sensing
6		Applications of remote sensing techniques in geological purposes.

Renewable Energy

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**

538. Environmental awareness 539. Renewable energy technologies 540. Energy efficiency behaviour 541. Technology and innovation 542. Climate change policy 543. Climate change adaptation 544. Sustainable consumption and production 545. Sustainable communities 546. Sustainable construction 547. Environmental awareness 548. Climate change: Science, impacts & scenarios 549. Sustainable development and resilience 550. Future climate change scenarios	743. Dealing with uncertainty 744. Adaptive learning and self-reflection; 745. Awareness and advocacy raising 746. Communicating 747. Contextualising 748. Critical, systemic and futures thinking 749. Debating 750. Discourse 751. Futures thinking 752. Integrated assessment 753. Leadership 754. Local knowledge 755. Mapping gender impacts 756. Motivate and manage change 757. Networked learning 758. Prioritising 759. Problem solving 760. Resolve ethical dilemmas 761. Scenario analysis and planning 762. Team management	851. Accountability 852. Confident 853. Decisive 854. Democratic 855. Empathy 856. Environmental justice 857. Openness to novelty and change 858. Optimism 859. Organised 860. Respect and care for the community 861. Respect for diversity 862. Social responsibility 863. Sense of urgency 864. Human wellbeing 865. Human rights 866. Solidarity 867. Perspective 868. Co-responsibility 869. Systematic 870. Focussed	119. Explain the impacts of traditional energy resources on environment. 120. Compare and contrast the advantages and disadvantages of renewable energy resources with the advantages and disadvantages of traditional energy resources. 121. Identify the basic principles of renewable energy technologies. 122. Question the relation between sustainable development and the use of renewable energy resources. 123. Discuss the different types of renewable energy resources. 124. Anticipate possible future environmental change and identify possible development consequences. 125. Appreciate the positive impacts of utilizing renewable energy resources on the environment. 126. Explain the relationship between poverty, environment, climate change, and the insufficient supply of energy. 127. Use the different tools and equipments of renewable energy resources.

Course Syllabus

Course Number:

Renewable Energy

Port Said University, Faculty of Science, Department of Physics,
Fall Semester

Instructor Information

Instructor:
Office Location: Faculty of Science Campus
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **renewable energy**
Course Location: University Campus
Class Times:
Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to raise the students' awareness of renewable energy resources. It introduces them to the benefits of using clean energy resources. It does so through tackling the following aspects: 1) traditional and renewable energy resources; 2) impact of energy consumption on environment; 3); clean energy resources and climate change; 4) availability of solar and wind energy in Egypt; and 5) energy and future global climate change. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is they are asked to read and summarize articles on renewable energy resources. They are invited to discuss impacts of energy resources on environment at local, national and international scales. In short, the course provides an appropriate chance for the students to get the minimum knowledge of the advantages and disadvantages of renewable energy resources.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of the renewable energy resources; b) to raise the learners' awareness of the need to explore renewable energy resources in order to achieve the goals of community development; c) help learners use traditional and electronic tools to identify the risks of the petroleum and natural gas limitations in Egypt; and d) to highlight the importance of renewable energy resources as clean and safe resources to the environment.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

128. Explain the impacts of traditional energy resources on environment.
129. Compare and contrast the advantages and disadvantages of renewable energy resources with the advantages and disadvantages of traditional energy resources.
130. Identify the basic principles of renewable energy technologies.
131. Question the relation between sustainable development and the use of renewable energy resources.
132. Discuss the different types of renewable energy resources.

133. Anticipate possible future environmental change and identify possible development consequences.
134. Appreciate the positive impacts of utilizing renewable energy resources on the environment.
135. Explain the relationship between poverty, environment, climate change, and the insufficient supply of energy.
136. Use the different tools and equipments of renewable energy resources .

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

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Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Energy Resources and Supply.
3		Renewable energies and clean technologies.
4		Solar Energy, solar cells, solar thermal heating systems, and electricity generation.
5		Tidal and Hydro as renewable energy resources.
6		Renewable Energy Integration and Energy Efficiency in the Built Environment
7		Research Design Methods.

Scientific Culture

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
551. Environmental awareness 552. Weather and climate 553. Climate change and livelihoods 554. Gender-sensitive response to climate change 555. Climate change communication 556. Fairness and climate change justice 557. Future climate change scenarios	763. Adaptive learning and self-reflection; 764. Awareness and advocacy raising 765. Carbon literacy for procurement 766. Communicating 767. Contextualising 768. Critical, systemic and futures thinking 769. Debating 770. Discourse 771. Emergency psychology 772. Futures thinking 773. Global dynamics 774. Integrated assessment 775. Leadership 776. Local knowledge 777. Mapping gender impacts 778. Motivate and manage change 779. Networked learning 780. Prioritising 781. Problem solving 782. Resolve ethical	871. Accountability 872. Confident 873. Decisive 874. Democratic 875. Empathy 876. Environmental justice 877. Gender-sensitive 878. Global mind-set/ consciousness 879. Interdependency 880. Needs vs. wants 881. Nonviolence & peace 882. Openness to novelty and change 883. Optimism 884. Organised 885. Respect and care for the community 886. Respect for diversity 887. Social cohesion 888. Social responsibility 889. Stewardship	29. Become familiar with the basic terminology and core concepts of climate change adaptation planning. 30. Identify the most likely impacts of local climatic hazards. 31. Articulating what good climate resilient development actually look like. 32. Compare local problems with problems elsewhere and to gain adaptation ideas from this comparison. 33. Comprehend the opportunities for planners and the social, economic and ecological risks of climate change. 34. Understand historical community reactions to and coping strategies for climatic hazards. 35. Contribute to the debate on global environmental change and societal adaptation strategies; to become an informed citizen and decision maker. 36. Demonstrate capacities for self-reflection and self-evaluation as integral aspects of the adaptive learning cycle. 37. Questioning business as usual can threaten our ideals, values, beliefs, business strategies and technical understanding and is not necessarily what everyone wants to hear.

	dilemmas 783. Scenario analysis and planning 784. Team management	890. Tolerance 891. Transparency 892. Virtue	38. Draw on active teaching and learning approaches to empower learner, young people and civic engagement. 39. Anticipate possible future environmental change and identify possible development consequences. 40. Appreciate the importance and practical characteristics of adaptive approaches. 41. Demonstrate knowledge and understanding of relationship between poverty, environment, climate change, economics and social issues. 42. Relate climate change and sustainability policy to a range of curricular areas in formal, non formal and informal education.

Course Syllabus

Course Number:

Scientific Culture

University of Port Said, Faculty of Education, Department of Curricula and Methods of Teaching,

Fall Semester, 2013-2014

Instructor Information

Instructor: Dr, Mahmoud Mohammed Mohasseb

Office Location: Faculty of Education Campus

Telephone: Office –

Office Hours: Tuesday 14.30- 17.00, Wednsday 14.00 – 16.00

E-mail:

Website:

Course Identification

Course Number: **Γ0**

Course Name: **Scientific Culture**

Course Location: University Campus

Class Times: Wednesday 8:30pm – 11:30am

Prerequisites:

Faculty Web Page:

Course Description/Overview

Education can be the catalyst for empowering students to become critical, reflective and active citizens. Teachers have the potential to be what Giroux and McLaren described as transformative intellectuals who combine scholarly reflection and practice in the service of educating students to be thoughtful, active citizens. The present course is intended to raise the students' environmental awareness. It introduces them to the challenges resulting from climate change. . It does so through tackling the following logically sequenced six issues: 1) Weather and climate; 2) Climate change and livelihoods; 3) Gender-sensitive response to climate change; 4) Climate change communication; 5) Fairness and climate change justice; and 6) Future climate change scenarios. Issues 3-6 are, however, deeply covered through active participation of the students. Students are encouraged to collect, analyse, report and discuss information and data both outside and inside the classroom. That is they are asked to read and summarize articles on climate changes. They are invited to discuss scenarios for the management of climate changes at local, national and international scales. In short, the course provides an appropriate chance for the students practice their role as future citizens.

Course Learning Objectives

The overarching goals of this course are: a) to provide a critical approach to the consequences of climate changes – at local, national and international scales - in the context of education for sustainability; b) raise awareness of the role of the learners to reflect critically on the rights, roles and responsibilities of an active citizen in preparing for a sustainable future for all; and c) use traditional and electronic resources as well as social networking technologies as tools to help the community, including children, identify risks and develop climate change adaptation strategies.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

111. Become familiar with the basic terminology and core concepts of climate change adaptation planning.
112. Identify the most likely impacts of local climatic hazards.
113. Articulating what good climate resilient development actually look like.
114. Compare local problems with problems elsewhere and to gain adaptation ideas from this comparison.

115. Comprehend the opportunities for planners and the social, economic and ecological risks of climate change.
116. Understand historical community reactions to and coping strategies for climatic hazards.
117. Contribute to the debate on global environmental change and societal adaptation strategies; to become an informed citizen and decision maker.
118. Demonstrate capacities for self-reflection and self-evaluation as integral aspects of the adaptive learning cycle.
119. Questioning business as usual can threaten our ideals, values, beliefs, business strategies and technical understanding and is not necessarily what everyone wants to hear.
120. Draw on active teaching and learning approaches to empower learner, young people and civic engagement.
121. Anticipate possible future environmental change and identify possible development consequences.
122. Appreciate the importance and practical characteristics of adaptive approaches.
123. Demonstrate knowledge and understanding of relationship between poverty, environment, climate change, economics and social issues.
124. Relate climate change and sustainability policy to a range of curricular areas in formal, non formal and informal education.

- **Course Resources**

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

- Gender and Climate Change Adaptation: Tools for Community-level Action in Nigeria, http://africanclimate.net/en/node/8979
- Climate Change: Key Concepts. **http://www.careclimatechange.org/tk/cba/en/cba_** basics/key_concepts.html
- The Intergovernmental Panel on Climate Change (IPCC) is a body set up to provide scientific, technical and socio-economic information in a policy-relevant but policy neutral way to decision makers.
- IPCC, 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.
- Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.*
- Task Force on Climate Change, Vulnerable Communities and Adaptation (IUCN, SEI and IISD), 2003. Livelihoods and Climate Change. Combining Disaster Risk Reduction, Natural Resource Management and Climate Change adaptation in a new approach to the reduction of vulnerability and poverty. International Institute for Sustainable Development, Canada.
- World Bank 2009. Convenient Solutions to an Inconvenient Truth: Ecosystem-based Approaches to Climate Change. Environment Department, World Bank.
- Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.*
- Adapted from: UNISDR, 2009. Terminology: Basic terms of disaster risk reduction and IISD et al, 2007. Community-based Risk Screening – Adaptation and Livelihoods (CRiSTAL) User's Manual, Version 3.0.
- UNISDR, 2009. Terminology: Basic terms of disaster risk reduction. Department for International Development, UK (DFID). 2001. *Sustainable Livelihoods Guidance Sheet*. Available at **http://www.nssd.net/pdf/ sectiont.pdf**.
- Scoones, Ian (2005): The Sustainable Rural Livelihoods: A Framework for Analysis. Institute for Development Studies, University of Sussex. England. **http://www.sarpn.org.za/www.careclimatechange.org/files/adaptation/ d0001493/P1833-Sustainable-rural-livelihoods_IDS-paper72.pdf**.
- IPCC, 2007: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.

- NASA - What's the Difference Between Weather and Climate? http://www. nasa.gov/mission_ pages/noaan/climate/climate_weather.html#. VAv8Mfl_vdM February 1, 2005
- Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 http://ezinearticles.com/?How-to-Promote-Environmental-Awareness&id=7141986
- *Livelihoods and Climate Change* ***http://www.iisd.org/ecp/es/resilience/*** *climate.asp*
- Livelihoods and Climate Change Project Snapshot (PDF - 438 kb), http://www.iisd.org/ecp/es/resilience/climate.asp
- Livelihoods and Climate Change: Combining disaster risk reduction, natural resource management and climate change adaptation in a new approach to the reduction of vulnerability and poverty (PDF - 1.6 mb), http://www.iisd.org/ecp/es/resilience/climate.asp
- Steve Vanderheiden Climate Change, Fairness, and Equity in *Atmospheric Justice* Published in print June 2008|ISBN: 9780195334609 Published online May 2008 | e-ISBN: 9780199868759 | DOI: http://dx.doi .org/10.1093/acprof:oso/9780195334609.003.0002 http://oxfordindex.o up.com/ view/10.1093/ acprof:oso/9780195334609. 003.0002
- Carter, T.R. *et al*. (2001). "Developing and Applying Scenarios. In: Climate Change 2001: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change [J.J. McCarthy *et al.* Eds.]". Cambridge University Press, Cambridge, U.K., and New York, N.Y., U.S.A. Retrieved 2010-01-10.
- "Using the Clean Air Act to Sharply Reduce Carbon Pollution from Existing Power Plants". Natural Resources Defense Counsel. Retrieved October 9, 2013.
- Morita *et al.*, "Chapter 2, Greenhouse Gas Emission Mitigation Scenarios and Implications", Sec. 2.5.1.1 IPCC Emissions Scenarios and the SRES Process, in IPCC TAR WG3 2001.
- Karl, TR, *et al*, ed. (2009), "Global climate change", *Global Climate Change Impacts in the United States*, New York, NY, USA: Cambridge University Press, p. 22, ISBN 978-0-521-14407-0
- Rogner, H.-H., *et al.*, "Introduction", Sec 1.3.2 Future outlook, in IPCC AR4 WG3 2007
- Section 4.4.1, Carbon dioxide emissions from energy supply by 2030, in IPCC AR4 WG3 2007

- IPCC AR4 WG3 (2007), Metz, B.; Davidson, O.R.; Bosch, P.R.; Dave, R.; and Meyer, L.A., ed., *Climate Change 2007: Mitigation of Climate Change*, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, ISBN 978-0-521-88011-4(pb: 978-0-521-70598-1).

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave

early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

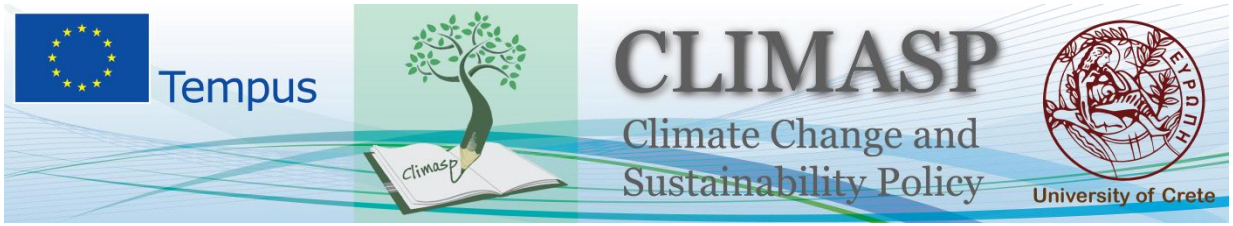
Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Environmental awareness
3		Weather and climate
4		Climate change and livelihoods
5		Climate change and livelihoods (man, plant, animals)
6		Gender-sensitive response to climate change
7		Male/Female: awareness of climate change consequences
8		Male/Female: roles to alleviate climate change consequences
9		Climate change communication (Concepts)

10		Climate change communication (tools: design)
11		Climate change communication (tools: implementation/analysis)
12		Fairness and climate change justice
13-15		Future climate change scenarios

Course Modules



Course	Scientifc Culture
Module 1	**Climate Change : Environmental Impacts**
Key Concepts	Climate Change, Environment
Overview	The term environment may be vague for many students, Some of them my be concerned with the physical environment around them. They might ignore my cultural components of environment which are responsible for shaping mans attitudes, and in turn, influence our behaviour. Such behaviour might aggregate or alleviate the environmental challenges. Mans behaviour may be affected by climate change. So, his reaction toward the environment is almost disastrous!! Issues addressed in this module include: definition of environment, components of environment: physical and cultural; basic differences between weather and climate; and impacts of local climatic hazards.
Aim	The aim of this module is to turn students able to discourse on basic concepts related to environment and the impact of climate change.
Learning Outcomes	At the end of this module learners will be able to: 7. Become familiar with the basic terminology and core concepts of climate change adaptation planning. 8. Identify the most likely impacts of local climatic hazards. 9. Articulating what good climate resilient development actually look like.
Units	Unit 1.1: Environment: Physical and Cultural

	Unit 1.2: Man VS Environment Unit 1.3: Weather and Climate
Readings	• Climate Change: Key Concepts. **http://www.careclimatechange.org/tk/cba/en/cba_**basics/key_concepts.html • The Intergovernmental Panel on Climate Change (IPCC) is a body set up to provide scientific, technical and socio-economic information in a policy-relevant but policy neutral way to decision makers. • IPCC, 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp. • Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.* • NASA - What's the Difference Between Weather and Climate? http://www.nasa.gov/mission_ pages/noaan/climate/climate_weather.html#.VAv8Mfl_vdM February 1, 2005 • Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness&id=7141986**

Activity	**Overview** Assignment 1.1: Reflecting Upon environmental issues 1. To what extent is responsible for environmental problems? (3-4 paragraphs) 2. What can we do to alleviate environmental problems? 3. draw a table of comparison to show the main differences between climate and weather. Assignment 1.2: Investigate local environmental problems to: - Make a list of most serious environmental problems - Interview a sample of citizens to identify their awareness of such problems. Access and explore the following report to identify and summarize its main ideas with regard the management of the environmental impacts of Climate Change: World Bank 2009. Convenient Solutions to an Inconvenient Truth: Ecosystem-based Approaches to Climate Change. Environment Department, World Bank.
Module 2	Climate Change and Livelihoods: Problems and Solutions
Key Concepts	Climate change , livelihoods (man, plant, animals)

Overview	The world is highly susceptible to a number of natural hazards droughts including, floods and hurricanes. Increasing in frequency and ferocity as a result of changing climate systems, these disasters are placing increased stress on inhabitants and severely impairing economic growth as they batter climate vulnerable sectors like tourism and agriculture upon which the region is financially reliant.In order to avoid risks and damage and to strengthen human resilience to natural disasters, governments need to be prepared. However, in developing countries, the ability of governments to help is often very limited. The impacts of loss and damage associated with natural disasters can set back development by increasing the incidence and severity of poverty. Poverty and vulnerability are fundamentally intertwined: the poor have fewer resources to cope with climate risk and thus their resource base is further diminished with every extreme weather event, deepening their poverty. This module is intended to raise the students awareness towards local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas for the management of such problems.
Aim	The overriding aim of this module is to identify local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas from this comparison.
Learning Outcomes	At the end of this module learners will be able to compare local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas from this comparison.
Units	Unit 2.1: Climate change and livelihoods Unit 2.2: Climate change and livelihoods (man, plant, animals)
Readings	• Task Force on Climate Change, Vulnerable Communities and Adaptation (IUCN, SEI and IISD), 2003. Livelihoods and Climate Change. Combining Disaster Risk Reduction, Natural Resource Management and Climate Change adaptation in a new approach to the reduction of vulnerability and poverty. International Institute for Sustainable Development, Canada.

	• Scoones, Ian (2005): The Sustainable Rural Livelihoods: A Framework for Analysis. Institute for Development Studies, University of Sussex. England. **http://www.sarpn.org.za/www.careclimatechange.org/files/adaptation/d0001493/P1833-Sustainable-rural-livelihoods_IDS-paper72.pdf**. • *Livelihoods and Climate Change **http://www.iisd.org/ecp/es/resilience/** climate.asp* • Livelihoods and Climate Change Project Snapshot (PDF - 438 kb), http://www.iisd.org/ecp/es/resilience/climate.asp • Livelihoods and Climate Change: Combining disaster risk reduction, natural resource management and climate change adaptation in a new approach to the reduction of vulnerability and poverty (PDF - 1.6 mb), http://www.iisd.org/ecp/es/resilience/climate.asp
Activity	**Overview**
	Design poster showing local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas for the management of such problems.
Module 3	**Gender-Sensitive Response to Climate Change**
Key Concepts	Gender-Sensitive
Overview	A gender-sensitive response does not mean having a set of disaggregated data showing that climate change has differential impacts on women and men. In fact, it is obvious. So more than that, it requires an understanding of the nature of existing inequalities between women and men, their consequences, and then coming up with strategies to nullify them. However, due to their social status men may have greater access to vital information on climate change mitigation or adaptation strategies, or women are too busy with caring and other domestic responsibilities so they lack this information. Therefore, lack of information and lack of opportunity to voice their concerns about adaptation and mitigation strategies could jeopardize their safety when climate change events strike.

	To counter this situation, strategies need to be planned so that women receive as much information on climatic events and conditions as men do. Women are also more likely than men to be absent from decision-making, right from home, to community, to national, to international levels for two reasons. One, their opinion is not given importance and two, they don't have time or confidence or opportunity to share. Therefore, whatever the reasons are they are simply marginalized; and the same is true for elderly and children. The net result is that they remain more vulnerable than men. Thus, if effective adaptation strategies have to be chalked out for them they must be drawn out to participate in the climate change discussions which in turn, means challenging the traditional assumptions about their capabilities and redefining their gender equation. For centuries, women have passed on their skills in water management, forest management and the management of biodiversity, among others. Through these experiences, women have acquired valuable knowledge that will allow them to contribute positively to the identification of appropriate adaptation and mitigation techniques, if only they are given the opportunity. The present module is concerned with: Male/Female awareness of climate change consequences; as well as their role in the management of climate change consequences.
Aim	This module encourages the students to the debate on global environmental change and societal adaptation
Learning Outcomes	At the end of this module learners will be able to: • Contribute to the debate on global environmental change and societal adaptation strategies; to become an informed citizen and decision maker. • Demonstrate capacities for self-reflection and self-evaluation as integral aspects of the adaptive learning cycle.
Units	Unit 3.1: Gender-sensitive response to climate change

	Unit 3.2: Male/Female: awareness of climate change consequences Unit 3.3: Male/Female: how to alleviate climate change consequences
Readings	• Gender and Climate Change Adaptation: Tools for Community-level Action in Nigeria, http://africanclimate.net/en/node/8979 • Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.* • IPCC, 2007: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.
Activity	**Overview**
	Assignment 1: Propose a strategy to: 5- Raise the awareness of both Male and Female citizen towards the climate change consequences in your local environment 6- how to involve both Male and Female citizen in the management of climate change consequences in your local environment
Module 4	**Climate Change Communication**
Key Concepts	social, economic and ecological risks of climate change; civic engagement

Overview	The rapid development of multimedia and hypermedia technologies has provided new avenues for merging images, sound, movies and animation together with texts. These can serve as effective tools for communicating information and data related to climate change concepts, causes and consequences. Climate change is the result of human actions and choices. Limiting climate change – and protecting people and ecosystems to the degree possible from unavoidable changes in the climate – will require significant public engagement in the issue so that difficult decisions can be made by members of the public and policy makers. So, the need emerges for unbiased social science research that will facilitate such public engagement. In other words, students should be trained on how to use social science research methods – experiments, surveys, in-depth interviews and other methods – to find ways of effectively engaging the public and policy makers in the problem, and in considering and enacting solutions. Social science research has played important roles in many social change campaigns over the past several decades, including reducing smoking and littering, and increasing seat belt use and recycling. So, they can conduct unbiased public engagement research - and help government agencies, non-profit organizations, and companies apply the results of this research - so that collectively, we can stabilize our planet's life sustaining climate.
Aim	The overriding aim of this module is encourage the students explore and use appropriate tools to communicate social, economic and ecological risks of climate change.
Learning Outcomes	At the end of this module learners will be able to: - Comprehend the opportunities for planners and the social, economic and ecological risks of climate change. - Understand historical community reactions to and coping strategies for climatic hazards. - Questioning business as usual can threaten our ideals, values, beliefs,

	business strategies and technical understanding and is not necessarily what everyone wants to hear. - Draw on active teaching and learning approaches to empower learner, young people and civic engagement.
Units	Unit 3.1: Climate Change Communication (Concepts) Unit 3.2: Climate Change Communication (tools: design) Unit 3.3: Climate Change Communication (tools: implementation/analysis)
Readings	• Adapted from: UNISDR, 2009. Terminology: Basic terms of disaster risk reduction and IISD et al, 2007. Community-based Risk Screening – Adaptation and Livelihoods (CRiSTAL) User's Manual, Version 3.0. • UNISDR, 2009. Terminology: Basic terms of disaster risk reduction. Department for International Development, UK (DFID). 2001. *Sustainable Livelihoods Guidance Sheet*. Available at **http://www.nssd.net/pdf/sectiont.pdf**.
Activity	**Overview**
	Assignment: Students are invited to work in groups to: - Design appropriate tools to communicate social, economic and ecological risks of climate change. - Write a report on the obtained results of communicating social, economic and ecological risks of climate change. - Orally present the outcomes of the above report
Module 5	Climate Change: Justice and Future Scenarios
Key Concepts	climate change fairness, justice; future scenarios.
Overview	This module is about climate change scenarios. Socioeconomic scenarios are used by analysts to make projections of future greenhouse gas (GHG) emissions and to assess future vulnerability to climate change. Producing scenarios requires estimates of future population levels, economic activity, the structure of governance, social values, and patterns of

	technological change. Economic and energy modelling (such as via the World3 or the POLES models) can be used to analyse and quantify the effects. These scenarios can be thought of as stories of possible futures. They allow the description of factors that are difficult to quantify, such as governance, social structures, and institutions. However, researcher claim a considerable variety among scenarios, ranging from variants of sustainable development, to the collapse of social, economic, and environmental systems.
Aim	The overriding aim of this module is to equip students with the capacity to actualise issues such as fairness and climate change justice; future climate change scenarios.
Learning Outcomes	At the end of this module learners will be able to contribute to group discussion with regard: • possible future environmental change and identify possible development consequences. • the importance and practical characteristics of adaptive approaches. • The relationship between poverty, environment, climate change, economics and social issues. • climate change and sustainability policy and a range of curricular areas in formal, non formal and informal education.
Units	Unit 5.1: Fairness and climate change justice Unit 5.2: Future climate change scenarios
Readings	• Steve Vanderheiden Climate Change, Fairness, and Equity in *Atmospheric Justice* Published in print June 2008|ISBN: 9780195334609 Published online May 2008 | e-ISBN: 9780199868759 | DOI: http://dx.doi .org/10.1093/acprof:oso/9780195334609.003.0002 http://oxfordindex.oup.com/ view/10.1093/ acprof:oso/9780195334609. 003.0002 • Carter, T.R. *et al*. (2001). "Developing and Applying Scenarios. In: Climate Change 2001: Impacts, Adaptation and Vulnerability. Contribution of

	Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change [J.J. McCarthy *et al.* Eds.]". Cambridge University Press, Cambridge, U.K., and New York, N.Y., U.S.A. Retrieved 2010-01-10. • "Using the Clean Air Act to Sharply Reduce Carbon Pollution from Existing Power Plants". Natural Resources Defense Counsel. Retrieved October 9, 2013. • Morita *et al.*, "Chapter 2, Greenhouse Gas Emission Mitigation Scenarios and Implications", Sec. 2.5.1.1 IPCC Emissions Scenarios and the SRES Process, in IPCC TAR WG3 2001. • Karl, TR, *et al*, ed. (2009), "Global climate change", *Global Climate Change Impacts in the United States*, New York, NY, USA: Cambridge University Press, p. 22, ISBN 978-0-521-14407-0 • Rogner, H.-H., *et al.*, "Introduction", Sec 1.3.2 Future outlook, in IPCC AR4 WG3 2007 • Section 4.4.1, Carbon dioxide emissions from energy supply by 2030, in IPCC AR4 WG3 2007 • IPCC AR4 WG3 (2007), Metz, B.; Davidson, O.R.; Bosch, P.R.; Dave, R.; and Meyer, L.A., ed., *Climate Change 2007: Mitigation of Climate Change*, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, ISBN 978-0-521-88011-4(pb: 978-0-521-70598-1).
Activity	**Overview**

	In groups, students are required to: **9- Explore a variety of resources on** - possible future environmental change and identify possible development consequences. - the importance and practical characteristics of adaptive approaches. - the relationship between poverty, environment, climate change, economics and social issues. - climate change and sustainability policy and a range of curricular areas in formal, non formal and informal education**.** **10- Summarize key ideas on the above issues, to be orally reported.** **11- Discuss the data reported in step (2).** **12- Propose at least three Scenarios that can be applicable to the students local environment.**

Scientific Culture

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**

558. Environmental awareness 559. Weather and climate 560. Climate change and livelihoods 561. Gender-sensitive response to climate change 562. Climate change communication 563. Fairness and climate change justice 564. Future climate change scenarios	785. Adaptive learning and self-reflection; 786. Awareness and advocacy raising 787. Carbon literacy for procurement 788. Communicating 789. Contextualising 790. Critical, systemic and futures thinking 791. Debating 792. Discourse 793. Emergency psychology 794. Futures thinking 795. Global dynamics 796. Integrated assessment 797. Leadership 798. Local knowledge 799. Mapping gender impacts 800. Motivate and manage change 801. Networked learning 802. Prioritising 803. Problem solving 804. Resolve ethical dilemmas 805. Scenario analysis and planning	893. Accountability 894. Confident 895. Decisive 896. Democratic 897. Empathy 898. Environmental justice 899. Gender-sensitive 900. Global mind-set/ consciousness 901. Interdependency 902. Needs vs. wants 903. Nonviolence & peace 904. Openness to novelty and change 905. Optimism 906. Organised 907. Respect and care for the community 908. Respect for diversity 909. Social cohesion 910. Social responsibility 911. Stewardship 912. Tolerance 913. Transparency 914. Virtue	43. Become familiar with the basic terminology and core concepts of climate change adaptation planning. 44. Identify the most likely impacts of local climatic hazards. 45. Articulating what good climate resilient development actually look like. 46. Compare local problems with problems elsewhere and to gain adaptation ideas from this comparison. 47. Comprehend the opportunities for planners and the social, economic and ecological risks of climate change. 48. Understand historical community reactions to and coping strategies for climatic hazards. 49. Contribute to the debate on global environmental change and societal adaptation strategies; to become an informed citizen and decision maker. 50. Demonstrate capacities for self-reflection and self-evaluation as integral aspects of the adaptive learning cycle. 51. Questioning business as usual can threaten our ideals, values, beliefs, business strategies and technical understanding and is not necessarily what everyone wants to hear. 52. Draw on active teaching and learning approaches to empower learner, young people and civic engagement.

	806. Team management		53. Anticipate possible future environmental change and identify possible development consequences. 54. Appreciate the importance and practical characteristics of adaptive approaches. 55. Demonstrate knowledge and understanding of relationship between poverty, environment, climate change, economics and social issues. 56. Relate climate change and sustainability policy to a range of curricular areas in formal, non formal and informal education.

Course Syllabus

Course Number:

Scientific Culture

University of Port Said, Faculty of Education, Department of Curricula and Methods of Teaching,

Fall Semester, 2013-2014

Instructor Information

Instructor: Dr, Mahmoud Mohammed Mohasseb

Office Location: Faculty of Education Campus

Telephone: Office –

Office Hours: Tuesday 14.30- 17.00, Wednsday 14.00 – 16.00

E-mail:

Website:

Course Identification

Course Number: **Γ0**

Course Name: **Scientific Culture**

Course Location: University Campus

Class Times: Wednesday 8:30pm – 11:30am

Prerequisites:

Faculty Web Page:

Course Description/Overview

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Course Learning Objectives

The overarching goals of this course are: a) to provide a critical approach to the consequences of climate changes – at local, national and international scales - in the context of education for sustainability; b) raise awareness of the role of the learners to reflect critically on the rights, roles and responsibilities of an active citizen in preparing for a sustainable future for all; and c) use traditional and electronic resources as well as social networking technologies as tools to help the community, including children, identify risks and develop climate change adaptation strategies.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

125. Become familiar with the basic terminology and core concepts of climate change adaptation planning.
126. Identify the most likely impacts of local climatic hazards.
127. Articulating what good climate resilient development actually look like.
128. Compare local problems with problems elsewhere and to gain adaptation ideas from this comparison.

129. Comprehend the opportunities for planners and the social, economic and ecological risks of climate change.
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133. Questioning business as usual can threaten our ideals, values, beliefs, business strategies and technical understanding and is not necessarily what everyone wants to hear.
134. Draw on active teaching and learning approaches to empower learner, young people and civic engagement.
135. Anticipate possible future environmental change and identify possible development consequences.
136. Appreciate the importance and practical characteristics of adaptive approaches.
137. Demonstrate knowledge and understanding of relationship between poverty, environment, climate change, economics and social issues.
138. Relate climate change and sustainability policy to a range of curricular areas in formal, non formal and informal education.

- **Course Resources**

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

- Gender and Climate Change Adaptation: Tools for Community-level Action in Nigeria, http://africanclimate.net/en/node/8979
- Climate Change: Key Concepts. **http://www.careclimatechange.org/tk/cba/en/cba_** basics/key_concepts.html
- The Intergovernmental Panel on Climate Change (IPCC) is a body set up to provide scientific, technical and socio-economic information in a policy-relevant but policy neutral way to decision makers.
- IPCC, 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.
- Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.*
- Task Force on Climate Change, Vulnerable Communities and Adaptation (IUCN, SEI and IISD), 2003. Livelihoods and Climate Change. Combining Disaster Risk Reduction, Natural Resource Management and Climate Change adaptation in a new approach to the reduction of vulnerability and poverty. International Institute for Sustainable Development, Canada.
- World Bank 2009. Convenient Solutions to an Inconvenient Truth: Ecosystem-based Approaches to Climate Change. Environment Department, World Bank.
- Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.*
- Adapted from: UNISDR, 2009. Terminology: Basic terms of disaster risk reduction and IISD et al, 2007. Community-based Risk Screening – Adaptation and Livelihoods (CRiSTAL) User's Manual, Version 3.0.
- UNISDR, 2009. Terminology: Basic terms of disaster risk reduction. Department for International Development, UK (DFID). 2001. *Sustainable Livelihoods Guidance Sheet*. Available at **http://www.nssd.net/pdf/ sectiont.pdf**.
- Scoones, Ian (2005): The Sustainable Rural Livelihoods: A Framework for Analysis. Institute for Development Studies, University of Sussex. England. **http://www.sarpn.org.za/www.careclimatechange.org/files/adaptation/ d0001493/P1833-Sustainable-rural-livelihoods_IDS-paper72.pdf**.
- IPCC, 2007: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.

- NASA - What's the Difference Between Weather and Climate? http://www. nasa.gov/mission_ pages/noaan/climate/climate_weather.html#. VAv8Mfl_vdM February 1, 2005
- Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 http://ezinearticles.com/?How-to-Promote-Environmental-Awareness&id=7141986
- *Livelihoods and Climate Change* ***http://www.iisd.org/ecp/es/resilience/*** *climate.asp*
- Livelihoods and Climate Change Project Snapshot (PDF - 438 kb), http://www.iisd.org/ecp/es/resilience/climate.asp
- Livelihoods and Climate Change: Combining disaster risk reduction, natural resource management and climate change adaptation in a new approach to the reduction of vulnerability and poverty (PDF - 1.6 mb), http://www.iisd.org/ecp/es/resilience/climate.asp
- Steve Vanderheiden Climate Change, Fairness, and Equity in *Atmospheric Justice* Published in print June 2008|ISBN: 9780195334609 Published online May 2008 | e-ISBN: 9780199868759 | DOI: http://dx.doi .org/10.1093/acprof:oso/9780195334609.003.0002 http://oxfordindex.o up.com/ view/10.1093/ acprof:oso/9780195334609. 003.0002
- Carter, T.R. *et al*. (2001). "Developing and Applying Scenarios. In: Climate Change 2001: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change [J.J. McCarthy *et al.* Eds.]". Cambridge University Press, Cambridge, U.K., and New York, N.Y., U.S.A. Retrieved 2010-01-10.
- "Using the Clean Air Act to Sharply Reduce Carbon Pollution from Existing Power Plants". Natural Resources Defense Counsel. Retrieved October 9, 2013.
- Morita *et al.*, "Chapter 2, Greenhouse Gas Emission Mitigation Scenarios and Implications", Sec. 2.5.1.1 IPCC Emissions Scenarios and the SRES Process, in IPCC TAR WG3 2001.
- Karl, TR, *et al*, ed. (2009), "Global climate change", *Global Climate Change Impacts in the United States*, New York, NY, USA: Cambridge University Press, p. 22, ISBN 978-0-521-14407-0
- Rogner, H.-H., *et al.*, "Introduction", Sec 1.3.2 Future outlook, in IPCC AR4 WG3 2007
- Section 4.4.1, Carbon dioxide emissions from energy supply by 2030, in IPCC AR4 WG3 2007

- IPCC AR4 WG3 (2007), Metz, B.; Davidson, O.R.; Bosch, P.R.; Dave, R.; and Meyer, L.A., ed., *Climate Change 2007: Mitigation of Climate Change*, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, ISBN 978-0-521-88011-4(pb: 978-0-521-70598-1).

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave

early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

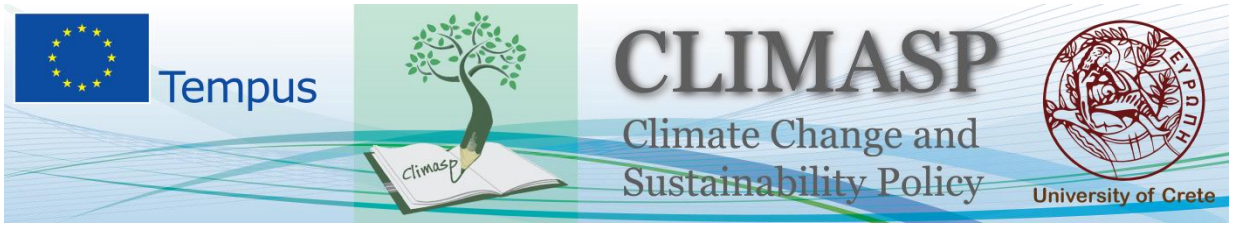
Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Environmental awareness
3		Weather and climate
4		Climate change and livelihoods
5		Climate change and livelihoods (man, plant, animals)
6		Gender-sensitive response to climate change
7		Male/Female: awareness of climate change consequences
8		Male/Female: roles to alleviate climate change consequences
9		Climate change communication (Concepts)

10		Climate change communication (tools: design)
11		Climate change communication (tools: implementation/analysis)
12		Fairness and climate change justice
13-15		Future climate change scenarios

Course Modules



Course	Scientifc Culture
Module 1	**Climate Change : Environmental Impacts**
Key Concepts	Climate Change, Environment
Overview	The term environment may be vague for many students, Some of them my be concerned with the physical environment around them. They might ignore my cultural components of environment which are responsible for shaping mans attitudes, and in turn, influence our behaviour. Such behaviour might aggregate or alleviate the environmental challenges. Mans behaviour may be affected by climate change. So, his reaction toward the environment is almost disastrous!! Issues addressed in this module include: definition of environment, components of environment: physical and cultural; basic differences between weather and climate; and impacts of local climatic hazards.
Aim	The aim of this module is to turn students able to discourse on basic concepts related to environment and the impact of climate change.
Learning Outcomes	At the end of this module learners will be able to: 10. Become familiar with the basic terminology and core concepts of climate change adaptation planning. 11. Identify the most likely impacts of local climatic hazards. 12. Articulating what good climate resilient development actually look like.
Units	Unit 1.1: Environment: Physical and Cultural

	Unit 1.2: Man VS Environment Unit 1.3: Weather and Climate
Readings	• Climate Change: Key Concepts. **http://www.careclimatechange.org/tk/cba/en/cba_**basics/key_concepts.html • The Intergovernmental Panel on Climate Change (IPCC) is a body set up to provide scientific, technical and socio-economic information in a policy-relevant but policy neutral way to decision makers. • IPCC, 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp. • Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.* • NASA - What's the Difference Between Weather and Climate? http://www.nasa.gov/mission_ pages/noaan/climate/climate_weather.html#.VAv8Mfl_vdM February 1, 2005 • Geoff M Dodson: How to Promote Environmental Awareness Submitted On June 25, 2012 **http://ezinearticles.com/?How-to-Promote-Environmental-Awareness&id=7141986**

Activity	**Overview** Assignment 1.1: Reflecting Upon environmental issues 1. To what extent is responsible for environmental problems? (3-4 paragraphs) 2. What can we do to alleviate environmental problems? 3. draw a table of comparison to show the main differences between climate and weather. Assignment 1.2: Investigate local environmental problems to: - Make a list of most serious environmental problems - Interview a sample of citizens to identify their awareness of such problems. Access and explore the following report to identify and summarize its main ideas with regard the management of the environmental impacts of Climate Change: World Bank 2009. Convenient Solutions to an Inconvenient Truth: Ecosystem-based Approaches to Climate Change. Environment Department, World Bank.
Module 2	Climate Change and Livelihoods: Problems and Solutions
Key Concepts	Climate change , livelihoods (man, plant, animals)

Overview	The world is highly susceptible to a number of natural hazards droughts including, floods and hurricanes. Increasing in frequency and ferocity as a result of changing climate systems, these disasters are placing increased stress on inhabitants and severely impairing economic growth as they batter climate vulnerable sectors like tourism and agriculture upon which the region is financially reliant.In order to avoid risks and damage and to strengthen human resilience to natural disasters, governments need to be prepared. However, in developing countries, the ability of governments to help is often very limited. The impacts of loss and damage associated with natural disasters can set back development by increasing the incidence and severity of poverty. Poverty and vulnerability are fundamentally intertwined: the poor have fewer resources to cope with climate risk and thus their resource base is further diminished with every extreme weather event, deepening their poverty. This module is intended to raise the students awareness towards local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas for the management of such problems.
Aim	The overriding aim of this module is to identify local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas from this comparison.
Learning Outcomes	At the end of this module learners will be able to compare local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas from this comparison.
Units	Unit 2.1: Climate change and livelihoods Unit 2.2: Climate change and livelihoods (man, plant, animals)
Readings	• Task Force on Climate Change, Vulnerable Communities and Adaptation (IUCN, SEI and IISD), 2003. Livelihoods and Climate Change. Combining Disaster Risk Reduction, Natural Resource Management and Climate Change adaptation in a new approach to the reduction of vulnerability and poverty. International Institute for Sustainable Development, Canada.

	• Scoones, Ian (2005): The Sustainable Rural Livelihoods: A Framework for Analysis. Institute for Development Studies, University of Sussex. England. **http://www.sarpn.org.za/www.careclimatechange.org/files/adaptation/d0001493/P1833-Sustainable-rural-livelihoods_IDS-paper72.pdf**. • *Livelihoods and Climate Change **http://www.iisd.org/ecp/es/resilience/** climate.asp* • Livelihoods and Climate Change Project Snapshot (PDF - 438 kb), http://www.iisd.org/ecp/es/resilience/climate.asp • Livelihoods and Climate Change: Combining disaster risk reduction, natural resource management and climate change adaptation in a new approach to the reduction of vulnerability and poverty (PDF - 1.6 mb), http://www.iisd.org/ecp/es/resilience/climate.asp
Activity	**Overview**
	Design poster showing local climate change and livelihoods problems with similar problems elsewhere and to gain adaptation ideas for the management of such problems.
Module 3	**Gender-Sensitive Response to Climate Change**
Key Concepts	Gender-Sensitive
Overview	A gender-sensitive response does not mean having a set of disaggregated data showing that climate change has differential impacts on women and men. In fact, it is obvious. So more than that, it requires an understanding of the nature of existing inequalities between women and men, their consequences, and then coming up with strategies to nullify them. However, due to their social status men may have greater access to vital information on climate change mitigation or adaptation strategies, or women are too busy with caring and other domestic responsibilities so they lack this information. Therefore, lack of information and lack of opportunity to voice their concerns about adaptation and mitigation strategies could jeopardize their safety when climate change events strike.

	To counter this situation, strategies need to be planned so that women receive as much information on climatic events and conditions as men do. Women are also more likely than men to be absent from decision-making, right from home, to community, to national, to international levels for two reasons. One, their opinion is not given importance and two, they don't have time or confidence or opportunity to share. Therefore, whatever the reasons are they are simply marginalized; and the same is true for elderly and children. The net result is that they remain more vulnerable than men. Thus, if effective adaptation strategies have to be chalked out for them they must be drawn out to participate in the climate change discussions which in turn, means challenging the traditional assumptions about their capabilities and redefining their gender equation. For centuries, women have passed on their skills in water management, forest management and the management of biodiversity, among others. Through these experiences, women have acquired valuable knowledge that will allow them to contribute positively to the identification of appropriate adaptation and mitigation techniques, if only they are given the opportunity. The present module is concerned with: Male/Female awareness of climate change consequences; as well as their role in the management of climate change consequences.
Aim	This module encourages the students to the debate on global environmental change and societal adaptation
Learning Outcomes	At the end of this module learners will be able to: • Contribute to the debate on global environmental change and societal adaptation strategies; to become an informed citizen and decision maker. • Demonstrate capacities for self-reflection and self-evaluation as integral aspects of the adaptive learning cycle.
Units	Unit 3.1: Gender-sensitive response to climate change

	Unit 3.2: Male/Female: awareness of climate change consequences Unit 3.3: Male/Female: how to alleviate climate change consequences
Readings	• Gender and Climate Change Adaptation: Tools for Community-level Action in Nigeria, http://africanclimate.net/en/node/8979 • Intergovernmental Panel on Climate Change (IPCC) Working Group 2, 2001. *Third Assessment Report, Annex B: Glossary of Terms.* • IPCC, 2007: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I.*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.
Activity	**Overview**
	Assignment 1: Propose a strategy to: 7- Raise the awareness of both Male and Female citizen towards the climate change consequences in your local environment 8- how to involve both Male and Female citizen in the management of climate change consequences in your local environment
Module 4	**Climate Change Communication**
Key Concepts	social, economic and ecological risks of climate change; civic engagement

Overview	The rapid development of multimedia and hypermedia technologies has provided new avenues for merging images, sound, movies and animation together with texts. These can serve as effective tools for communicating information and data related to climate change concepts, causes and consequences. Climate change is the result of human actions and choices. Limiting climate change – and protecting people and ecosystems to the degree possible from unavoidable changes in the climate – will require significant public engagement in the issue so that difficult decisions can be made by members of the public and policy makers. So, the need emerges for unbiased social science research that will facilitate such public engagement. In other words, students should be trained on how to use social science research methods – experiments, surveys, in-depth interviews and other methods – to find ways of effectively engaging the public and policy makers in the problem, and in considering and enacting solutions. Social science research has played important roles in many social change campaigns over the past several decades, including reducing smoking and littering, and increasing seat belt use and recycling. So, they can conduct unbiased public engagement research - and help government agencies, non-profit organizations, and companies apply the results of this research - so that collectively, we can stabilize our planet's life sustaining climate.
Aim	The overriding aim of this module is encourage the students explore and use appropriate tools to communicate social, economic and ecological risks of climate change.
Learning Outcomes	At the end of this module learners will be able to: - Comprehend the opportunities for planners and the social, economic and ecological risks of climate change. - Understand historical community reactions to and coping strategies for climatic hazards. - Questioning business as usual can threaten our ideals, values, beliefs,

	business strategies and technical understanding and is not necessarily what everyone wants to hear. - Draw on active teaching and learning approaches to empower learner, young people and civic engagement.
Units	Unit 3.1: Climate Change Communication (Concepts) Unit 3.2: Climate Change Communication (tools: design) Unit 3.3: Climate Change Communication (tools: implementation/analysis)
Readings	• Adapted from: UNISDR, 2009. Terminology: Basic terms of disaster risk reduction and IISD et al, 2007. Community-based Risk Screening – Adaptation and Livelihoods (CRiSTAL) User's Manual, Version 3.0. • UNISDR, 2009. Terminology: Basic terms of disaster risk reduction. Department for International Development, UK (DFID). 2001. *Sustainable Livelihoods Guidance Sheet*. Available at **http://www.nssd.net/pdf/sectiont.pdf**.
Activity	**Overview**
	Assignment: Students are invited to work in groups to: - Design appropriate tools to communicate social, economic and ecological risks of climate change. - Write a report on the obtained results of communicating social, economic and ecological risks of climate change. - Orally present the outcomes of the above report
Module 5	Climate Change: Justice and Future Scenarios
Key Concepts	climate change fairness, justice; future scenarios.
Overview	This module is about climate change scenarios. Socioeconomic scenarios are used by analysts to make projections of future greenhouse gas (GHG) emissions and to assess future vulnerability to climate change. Producing scenarios requires estimates of future population levels, economic activity, the structure of governance, social values, and patterns of

	technological change. Economic and energy modelling (such as via the World3 or the POLES models) can be used to analyse and quantify the effects. These scenarios can be thought of as stories of possible futures. They allow the description of factors that are difficult to quantify, such as governance, social structures, and institutions. However, researcher claim a considerable variety among scenarios, ranging from variants of sustainable development, to the collapse of social, economic, and environmental systems.
Aim	The overriding aim of this module is to equip students with the capacity to actualise issues such as fairness and climate change justice; future climate change scenarios.
Learning Outcomes	At the end of this module learners will be able to contribute to group discussion with regard: • possible future environmental change and identify possible development consequences. • the importance and practical characteristics of adaptive approaches. • The relationship between poverty, environment, climate change, economics and social issues. • climate change and sustainability policy and a range of curricular areas in formal, non formal and informal education.
Units	Unit 5.1: Fairness and climate change justice Unit 5.2: Future climate change scenarios
Readings	• Steve Vanderheiden Climate Change, Fairness, and Equity in *Atmospheric Justice* Published in print June 2008|ISBN: 9780195334609 Published online May 2008 | e-ISBN: 9780199868759 | DOI: http://dx.doi .org/10.1093/acprof:oso/9780195334609.003.0002 http://oxfordindex.oup.com/ view/10.1093/ acprof:oso/9780195334609. 003.0002 • Carter, T.R. *et al*. (2001). "Developing and Applying Scenarios. In: Climate Change 2001: Impacts, Adaptation and Vulnerability. Contribution of

	Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change [J.J. McCarthy *et al*. Eds.]". Cambridge University Press, Cambridge, U.K., and New York, N.Y., U.S.A. Retrieved 2010-01-10. • "Using the Clean Air Act to Sharply Reduce Carbon Pollution from Existing Power Plants". Natural Resources Defense Counsel. Retrieved October 9, 2013. • Morita *et al.*, "Chapter 2, Greenhouse Gas Emission Mitigation Scenarios and Implications", Sec. 2.5.1.1 IPCC Emissions Scenarios and the SRES Process, in IPCC TAR WG3 2001. • Karl, TR, *et al*, ed. (2009), "Global climate change", *Global Climate Change Impacts in the United States*, New York, NY, USA: Cambridge University Press, p. 22, ISBN 978-0-521-14407-0 • Rogner, H.-H., *et al.*, "Introduction", Sec 1.3.2 Future outlook, in IPCC AR4 WG3 2007 • Section 4.4.1, Carbon dioxide emissions from energy supply by 2030, in IPCC AR4 WG3 2007 • IPCC AR4 WG3 (2007), Metz, B.; Davidson, O.R.; Bosch, P.R.; Dave, R.; and Meyer, L.A., ed., *Climate Change 2007: Mitigation of Climate Change*, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, ISBN 978-0-521-88011-4(pb: 978-0-521-70598-1).
Activity	**Overview**

	In groups, students are required to: **13- Explore a variety of resources on** - possible future environmental change and identify possible development consequences. - the importance and practical characteristics of adaptive approaches. - the relationship between poverty, environment, climate change, economics and social issues. - climate change and sustainability policy and a range of curricular areas in formal, non formal and informal education**.** **14- Summarize key ideas on the above issues, to be orally reported.** **15- Discuss the data reported in step (2).** **16- Propose at least three Scenarios that can be applicable to the students local environment.**

Contamination of soil and its treatment

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**

565. Environmental awareness 566. Strategic planning 567. Environmental awareness 568. Environmental management 569. Technology and innovation 570. Climate change adaptation 571. Risk assessment 572. Climate variability 573. Weather and climate 574. Climate change communication 575. Climate change and health 576. Strategic planning and climate change 577. Role of international institutions 578. Climate change: Science, impacts & scenarios 579. Future climate change scenarios	807. Adaptive learning and self-reflection; 808. Communicating 809. Contextualising 810. Critical, systemic and futures thinking 811. Debating 812. Discourse 813. Futures thinking 814. Leadership 815. Local knowledge 816. Motivate and manage change 817. Problem solving 818. Resolve ethical dilemmas 819. Team management	915. Accountability 916. Confident 917. Decisive 918. Democratic 919. Empathy 920. Environmental justice 921. Openness to novelty and change 922. Optimism 923. Organised 924. Respect and care for the community 925. Respect for diversity 926. Social responsibility 927. Human rights 928. Sense of urgency 929. Human wellbeing 930. Social responsibility 931. Perspective 932. Co-responsibility 933. Systematic 934. Focussed	29. Discuss the sources of domestic, agricultural and industrial wastes and pollutants. 30. Identify the problems arising at pollution sites. 31. Devise solutions to the soil pollution problems. 32. Design soil treatment and water treatment process systems, among environmental processes. 33. Anticipate possible future environmental change and identify possible development consequences. 34. Estimate health impact of changes in soil pollution 35. Identify the different types of soil pollutants.

Course Syllabus

Course Number:

Contamination of soil and its treatment

Port Said University, Faculty of Science, Department of,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of Science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Contamination of Soil and its treatment**

Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to raise the students' awareness of soil . The course concentrates on the techniques employed in the analysis of the physical, hydrological, chemical, and biological properties of soils as well as those processes which control the development of the soil. It introduces students to the fundamentals of soil pollution with a background on historical perspective on soil pollution and a commentary on current soil quality policies and standards. It does so through tackling the following aspects: 1) natural sources of soil pollution, 2) anthropogenic sources of soil pollution, 3) airborne particulate matter, 5) negative impacts, 6) global warming, 7) soil pollution act, 8) atmospheric stability, 9) thermal invasion, 10) modelling of soil pollution and control devices. That is they are asked to read and summarize articles on soil pollution and its treatment. They are invited to discuss impacts of soil pollution on environment at local, national and international scales.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of soil pollution; b) to raise awareness of the learners about effects of soil pollution on climate; c) help learners use traditional and electronic tools to identify the risks the different types of soil pollutants; and d) to identify risks of soil pollution.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

36. Discuss the sources of domestic, agricultural and industrial wastes and pollutants.
37. Identify the problems arising at pollution sites.
38. Devise solutions to the soil pollution problems.
39. Design soil treatment and water treatment process systems, among environmental processes.
40. Anticipate possible future environmental change and identify possible development consequences.

41. Estimate health impact of changes in soil pollution
42. Identify the different types of soil pollutants.

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
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Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

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This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		History of air pollution;
2		Current policies, standards and objectives;
3		Sources of air pollution;
4		Effects of major air pollutants;
5		Monitoring of emissions and air pollutants in ambient air;
6		Modelling and control of emission from road transport;
7		Modelling and control of emission from industrial sources;
8		Chemistry and dispersion of air pollution in atmosphere;
9		Air pollution modelling approaches;
10		Commercial air quality models (ADMS, USEPA models;
11		Indoor air pollution;
12		Personal exposure to air pollution

The environmental impact assessment for projects

KNOWLEDGE (Concepts, theories, processes)	**SKILLS (Tools, methodologies, dynamics)**	**ATTRIBUTES (Innate abilities)**	**CLIMASP CORE COMPETENCES**
580. Environmental awareness 581. Climate change communication 582. Fairness and climate change justice 583. Future climate change scenarios 584. Technology and innovation 585. Climate change implications for integrated coastal planning 586. Risk assessment 587. Climate variability 588. Strategic planning and climate change 589. Role of international institutions 590. Climate change: Science, impacts & scenarios	820. Adaptive learning and self-reflection; 821. Awareness and advocacy raising 822. Communicating 823. Contextualising 824. Critical, systemic and futures thinking 825. Debating 826. Discourse 827. Futures thinking 828. Integrated assessment 829. Leadership 830. Local knowledge 831. Motivate and manage change 832. Networked learning 833. Prioritising 834. Problem solving 835. Scenario analysis and planning 836. Team management	935. Accountability 936. Confident 937. Decisive 938. Democratic 939. Empathy 940. Environmental justice 941. Openness to novelty and change 942. Optimism 943. Organised 944. Respect and care for the community 945. Respect for diversity 946. Social responsibility 947. Transparency 948. Sense of urgency 949. Human wellbeing 950. Human rights 951. Social responsibility 952. Perspective 953. Co-responsibility	**1-** Identify methods and principles of environmental assessment of the impacts of activities and pollutants. 2-Explain the dispersion and ecological distribution of pollutants during discharge and after emission. 3- Discuss the basics of project formulation, relationships between organisms and their environment and managing human, air and soil resources. 4- Explore the influence of economic activities on surrounding environment. 5- Summarize a wide range of laboratory and held methods directly applicable to the study of environmental problems.

		954. Systematic 955. Focussed	

Course Syllabus

Course Number:

The environmental impact assessment for projects

Port Said University, Faculty of science, Department of Environmental Sciences,
Fall Semester

Instructor Information

Instructor: Dr.

Office Location: Faculty of science

Telephone: Office –

Office Hours:

E-mail:

Website:

Course Identification

Course Number:

Course Name: **The environmental impact assessment for projects**

Course Location: University Campus

Class Times:

Prerequisites:

Faculty Web Page:

Course Description/Overview

The present course is intended to provide students with the key concepts about the methods and principles of environmental assessment of the impacts of activities and pollutants (predicting dispersion and ecological distribution of pollutants during discharge and after emission) with the introduction of the basics of project formulation, relationships between organisms and their environment and managing human, air and soil resources, A course which will familiarize students with a wide range of laboratory and held methods directly applicable to the study of environmental problems.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of methods and principles of environmental assessment of the impacts of activities and pollutants; b) to raise awareness of the learners about the need for predicting dispersion and ecological distribution of pollutants during discharge and after emission; c) and help learners to acquire the basics of project formulation, relationships between organisms and their environment and managing human, air and soil resources and d) give the basic understanding of a wide range of laboratory and held methods directly applicable to the study of environmental problems.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Identify methods and principles of environmental assessment of the impacts of activities and pollutants.

2-Explain the dispersion and ecological distribution of pollutants during discharge and after emission.

3- Discuss the basics of project formulation, relationships between organisms and their environment and managing human, air and soil resources.

4- Explore the influence of economic activities on surrounding environment.

5- Summarize a wide range of laboratory and held methods directly applicable to the study of environmental problems.

Course Resources

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Methods and principles of environmental assessment the impacts of activities and pollutants;.
3		the basics of project formulation
4		Relationships between organisms and their environment and managing human, air and soil resources. .
6		The influence of economic activities on surrounding environment.

Water Pollution

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
591. Environmental awareness 592. Climate change communication 593. Fairness and climate change justice 594. Future climate change scenarios 595. Technology and innovation 596. Climate change implications for integrated coastal planning 597. Risk assessment 598. Climate variability 599. Climate change communication 600. Climate change and health 601. Strategic planning and climate change 602. Role of international institutions	837. Adaptive learning and self-reflection; 838. Awareness and advocacy raising 839. Communicating 840. Contextualising 841. Critical, systemic and futures thinking 842. Debating 843. Discourse 844. Futures thinking 845. Integrated assessment 846. Leadership 847. Local knowledge 848. Motivate and manage change 849. Networked learning 850. Prioritising 851. Problem solving 852. Resolve ethical dilemmas 853. Scenario analysis and	956. Accountability 957. Confident 958. Decisive 959. Democratic 960. Empathy 961. Environmental justice 962. Openness to novelty and change 963. Optimism 964. Organised 965. Respect and care for the community 966. Respect for diversity 967. Social responsibility 968. Transparency 969. Sense of urgency 970. Human wellbeing 971. Human rights 972. Social responsibility	137. Discuss the sources of domestic, agricultural and industrial wastes and pollutants. 138. Identify the problems arising at pollution sites. 139. Devise solutions to the water pollution problem. 140. Design water treatment and wastewater treatment process systems, among environmental processes. 141. Apply the different steps of the monitoring cycle in rivers and lakes. 142. Anticipate possible future environmental change and identify possible development consequences. 143. Appreciate the positive impacts of utilizing renewable energy resources on the environment. 144. Apply common statistical techniques for water quality data evaluation. 145. Use the different tools and equipments of renewable energy resources.

603. Climate change: Science, impacts & scenarios 604. Future climate change scenarios	planning 854. Team management	973. Perspective 974. Co-responsibility 975. Systematic 976. Focussed	146. Apply concepts of water pollution processes in rivers and lakes.

Course Syllabus

Course Number:

Water Pollution

Port Said University, Faculty of Science, Department of Physics,
Fall Semester

Instructor Information

Instructor: Dr.
Office Location: Faculty of Science
Telephone: Office –
Office Hours:
E-mail:
Website:

Course Identification

Course Number:
Course Name: **Water pollution**
Course Location: University Campus
Class Times:
Prerequisites:
Faculty Web Page:

Course Description/Overview

The present course is intended to raise the students' awareness water. It introduces them to the benefits of using clean energy resources. It does so through tackling the following aspects: 1) natural sources of air pollution, 2) anthropogenic sources of air pollution, 3) airborne particulate matter, 4) size distribution of atmospheric aerosols, 5) negative impacts, 6) global warming, 7) air pollution act, 8) atmospheric stability, 9) thermal invasion, 10) modelling of air pollution and control devices. That is they are asked to read and summarize articles on renewable energy resources. They are invited to discuss impacts of energy resources on environment at local, national and international scales. In short, the course provides an appropriate chance for the students to get the minimum knowledge of the advantages and disadvantages of renewable energy resources.

Course Learning Objectives

The overarching goals of this course are: a) to provide a basic knowledge of air pollution; b) to raise awareness of the learners about effects of air pollution on climate; c) help learners use traditional and electronic tools to identify the risks the different types of air pollutants; and d) to highlight

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

147. Discuss the sources of domestic, agricultural and industrial wastes and pollutants.
148. Identify the problems arising at pollution sites.
149. Devise solutions to the water pollution problem.
150. Design water treatment and wastewater treatment process systems, among environmental processes.
151. Apply the different steps of the monitoring cycle in rivers and lakes.
152. Anticipate possible future environmental change and identify possible development consequences.
153. Appreciate the positive impacts of utilizing renewable energy resources on the environment.
154. Apply common statistical techniques for water quality data evaluation.
155. Use the different tools and equipments of renewable energy resources .
156. Apply concepts of water pollution processes in rivers and lakes.

Course Website(s)

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Energy Resources and Supply.
3		Renewable energies and clean technologies.
4		Solar Energy, solar cells, solar thermal heating systems, and electricity generation.
5		Tidal and Hydro as renewable energy resources.
6		Renewable Energy Integration and Energy Efficiency in the Built Environment
7		Research Design Methods.

EGYPT SCU

The CLIMASP Course Modules

Course: Principals of Pest Control

Key Concepts

Overview

The alarming increase in world population is a major concern. Food security and ability to feed such growing demand is a daunting challenge that face developing countries where growth rates are exceptionally high. With climate change, the possibility of major changes in pests landscape are very likely. The emergence of new pests, and the changing climate pattern would cause substantial change in plant protection policies and practices. Plant protection is a major tool to secure food security, nevertheless, the general view still holding is the negative image of pesticides as a potential culprit of biodiversity losses and environmental disturbance.

The present course is portraying advances in pest control methods, pesticides safe use, the application of new techniques including biotechnology and gene transfer in the domain of pesticides, and how to maintain environmental sustainability as an overarching paradigm. The present course is also a window to overview how changes in climate would affect the status of pests, their hosts and how to cope with these changes. The course is also giving special importance on how to control pests while maintaining sustainability and environmental integrity.

Aim of the Course

The course is to equip students with information about how control major pests, pests emerging as a result of climate changes. Principals of integrated pest management and biocontrol of pests are in the core of this course. Green chemistry as a major constituent of chemical control agents is highlighted.

Learning Outcome

At the end of this module learners will be able to:

-major pests and their economic impact

- weed control and herbicides selectivity

-how to manage pests, use of biocontol, chemical agents, pests and sustainbility

- how climate change might bring new species of pests,
-adaptation to climate change including how to mange newly emerged pests

Units

Unit 1.1- introduction to pest emergence, ecology, dynamics, ecosystem services, and sustainability
Unit 1.2 major changes in pest status and control methods, and the role of integrated pest management
Unit 1.3 pesticides classification, toxicity, persistence,
Unit 1.4 pesticides formulation, mixtures, label, registration and safe use
Unit 1.5 weeds classification and damage, herbicides, classification, mode of action and structure activity relationship, weeds selectivity
Unit 1.6 fungicides, acaricides, rodenticides, and nematocides
Unit 1.7 climate change as a factor contributing to emergence of new pests and how to adapt

Reading

1- -Pesticides Application Methods. Matthews G.A. (1985).
2- -Pesticides, preparation and mode of action. By R.Cremlyn. copyright by John Wiley and Sons, Ltd. 1978.
3--Pollution cases, effects and control. Third edition. By Roy M. Harrison. Published by the Royal Society of Chemistry (1996).
4- Complete Guide To Pest Control … Ware , W.G. (1988)

5-Pesticides, preparation and mode of action. By R. Cremlyn. copyright by John Wiley and Sons, Ltd. 1978.

6-Pesticides, preparation and mode of action. By R.Cremlyn. copyright by John Wiley and Sons, Ltd. 1978.
6- The Biochemistry and uses of Pesticides Hassal , K.A . (1990)

Activity

Assignment

1- what are the major drawback resulted from irrational use of pesticides
2- how to raise awareness to counter the irrational use of pesticides and their impact on ecosystem services and sustainability

3- how to draw a plan to combat pest resistance to pesticides
4- a pesticide is as good as its formulation, how to comment on this view
5- weed biology, classification, morphology and how to take advantage of shape and structure in herbicides selectivity
6- survey of contact and systemic fungicides, rodent control practices
7- emerging new pests as a potential threat, how to cope

The CLIMASP Course Modules

Course Name: Pollution of Water Resource

Key Concepts

Overview

Water scarcity if one of the daunting challenges facing millions around the globe. The massive increase in world population, coupled with the limited sources of water are causing serious drawbacks in many countries and Egypt is no exception. Water pollution is emerging as adding some new and dire dimension through limiting the use of the already scarce resource of water. Several reports, including IPPCs scenarios are expecting the worst to come for some countries in which Egypt is a potential one.

Fighting water pollution, is beyond doubt is one of the urgent tasks that should be looked at within the framework of sustainability. The present course is an endeavor to bring the generic view of water pollution to students, exploring the long term and short term impacts on livelihood and human wellbeing. The course introduces types of water pollutants including point and point pollutant, different species of pollutants, including organic and non organics, and the behaviour of each species on water ecosystem and humans. The course would also portray major environmental management systems employed in preserving water quality, including environmental impact assessment, water footprint, and others. The study of simple indicators that reflect the quality of water is also one of the sections dealt with.

Wastewater as one of the major pollutants of water bodies is a focal study part. Approaches to wastewater treatment are also studies with the main objective of using treated wastewater as a sustainable source of water, augmenting freshwater in particular usage such as industry and agriculture.

The impact of climate change on water resources and the possible repercussions is given special emphases, as part of global environmental changes.

Aim of the Course

The course is to equip students with information about major sources of water pollution, sources of pollution and the different species of these pollutants. In addition, the course would aim to introduce envirnmental management system as a measure to keep water integrity and quality. The expected impact of climate change on water resources is also one of main aims of this course

Learning Outcome

At the end of this module learners will be able to:

-how to identify major pollutants of water bodies
-how to apply environmental management system to manage water pollution
- how to restore the quality of polluted lakes
- sound treatment of wastewater in order to reuse in

Units

Unit 1.1- water as a main ecosystem service, global view, increasing demand and limited resource
Unit 1.2 major sources of pollution, their impacts, chronic and acute toxicity, behaviour in water bodies, including biomagnification, bioaccumulation, and others
Unit 1.3 Indicators of pollution, biological, BOD, COD, DO, and others
Unit 1.4 environmental management system, EIA, water fooprint, and use of green chemistry
Unit 1.5 treatment of polluted lakes and how to restore water quality
Unit 1.6 water bacteriology and methods of wastewater treatment
Unit 1.7 water self purification and metal bioremediation

Reading

The Greenhouse effect, Climate Change and the road to sustainability
Mohamed Tawfic Ahmed
http://grimstad.uia.no/puls/climatechange/

-Mohamed Tawfic Ahmed, Naglaa Loutfy, Maha Shoieb, and Yehia Mosleh

Residues of aliphatic and polycyclic aromatic hydrocarbons in lake Temsah, Ismailia, Egypt, an analytical search for hydrocarbons source and exposure bioindicators.
Human and Ecological Risk Assessment, September, 2013.
-M.S. El Sheirf, M. Tawfic Ahmed, M. A. Eldanasoury, and Nagwa El Nwishi
Effects of Pollutants on some Aquatic Organisms in Temsah Lake, Egypt
J. of Fisheries and Aquatic Science 4 (3), 150-160, 2009

-M.S. El Sheirf, M. Tawfic Ahmed, M. A. Eldanasoury, and Nagwa El Nwishi
Evaluation of diazanaon toxicity on Nile Telabia fish (O.niloticus)
J. of Fisheries and Aquatic Science, 4 (4), 169-17, 2009

-N. Loutfy, M. Fuerhackera, C. Lesueur M. Gartner, **M. Tawfic Ahmed** and A. Mentler Pesticide and non-dioxin-like polychlorinated biphenyls (NDL-PCBs) residues in foodstuffs from Ismailia city, Egypt,
-Pietro Tundo, Laila A. Reda, Yehia Y. Mosleh and **Mohamed Tawfic Ahmed**
Residues of PCDD, PCDF, and PCBs in some marine organisms in Lake Temsah, Ismailia, Egypt
Toxicological & Environmental Chemistry, January–March 2005; 87(1): 21–30

-Pietro Tundo, Stafano Raccannili, L. Reda **and Mohamed Tawfic Ahmed**
Distribution of polychlorinated dibenzo-p- dioxins, polychlorinated dibenzofurans, dioxin – like polychlorinated bipheny and polycyclic aromatic hydrocarbons in the sedimen of Temsah lake, Suez Canal, Egypt
J. Chemistry and Ecology, 2004, 20,257-265.

Activity

Assignment

1- Major pollutants in water bodies around Ismailia
2- Lake morphology and general character
3- Toxicology bioassay, biomagnification of contaminants through food chain, the use of models
4- EIA, methodology and application
5- Micorobial contamination, detection, presumptive and confirmatory tests
6- Counts of coliform using portable number method
7- Differentiation tests between coliform groups

APENDIX I:

CLIMASP COURSE SYLLABUS
Course Syllabus

Course Number:105

Agriculture Zoology

University of Suez Canal, Faculty of Agriculture, Department of plant protection,

Autumn Semester, 2013-2014

Instructor Information

Instructor: Dr. Marwa samir
Office Location: plant protection department –inside University Campus
Telephone: – +02 330 40 780
Office Hours: Sunday 12.30- 15.00, Tuesday 13.00 – 15.00
E-mail: marwa.samir @yahoo.com
Website: http://scuegypt.academia.edu/Marwakamel

Course Identification

Course Number: **105**
Course Name: **Agriculture Zoology**
Course Location: University Campus
Class Times: Monday 9.00 am – 11.00am
Prerequisites: ICT literacy
Faculty Web Page: http://www. *agriscu.scuegypt.edu.eg*

Course Description/Overview

Zoology is the scientific study of animal. Zoology is the study of animals, their behaviour, their physiology and evolution, as well as their interactions with each other
and with their environment. Zoologists also study how animals evolved and the impact of environmental change on their survival. They search for ways to manage wildlife populations, and to conserve rare and endangered species, such as takahe and tuatara. They study costs and benefits of conservation and ways to enhance species survival. Zoology is the branch of biology that includes the study of animals and animal life, including, but not limited to, the study of the structure, physiology and classification of animals. Zoology can be subdivided into two categories: Invertebrate zoology and Vertebrate zoology

Invertebrate means lacking a spinal column. Animals in this category include species of the following: protozoans, annelids, cnidarians, echinoderms, flatworms, nematodes, molluscs, and arthropods. Invertebrates make up 90% of the Earth's animals.

Vertebrate means to have a spinal column or backbone. Animals in this category include species of the phylum Chordata: fish, birds, reptiles, amphibians, and mammals. These are characterized by a segmented spinal cord and a distinct differentiated head. These animals possess internal skeletons which include the vertebral column which at least partially encloses the spinal cord and a skull which houses the brain. Finally climate change and animals - how does climate change affect animals?

Course Learning Objectives

The overarching goals of this course are: a) known description and installation of the animal cell and known to the different types of animal tissues. ; b) Study the morphology, structure and taxonomy of protozoa and helminthes. ;c) Know the a
cademic learning and introducing of basic physiology for an animal (vertebrate) models, different body systems ;d) propose plans to develop agricultural business including animal avoids the injury problems and defines the priorities for the development of rural communities ; and e) use participatory video and social networking technologies as tools to help the community, including children, identify risks and develop climate change adaptation strategies.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

a-Knowledge and Understanding:

a1-Understand the types of life cycles.
a2-Understand the physiology and reproduction of the invertebrates.
a3-Understand the food and Nutrition.
a4-Understand the Physiology and anatomy of body systems.

b-Intellectual Skills

b1-Understand the difference between the sexual and asexual reproduction and their life cycles.
b2-Know the normal physiology of animal (vertebrate) model with the anatomy of body systems.

c-Professional and Practical Skills

c1-General knowledge about the different phylam of zoology.
c2-Identification and dissection of different body systems of vertebrate models.

d-General and Transferable Skills

d1-Study the general classes in animal kingdom.

d2-Basic science knowledge of food and nutrition and different body system anatomy and physiology.

Course Resources

Course Notes: Animal Physiology and systematic Zoology

Essential Books (Text Books):

Text book of Medical Physiology, 11 thed. 2006 Elsevier Inc (Guyton & Hall)

Invertebrate 2nd ed. 2002 (Richard C. Brusca). Practical animal biology part1&2, Dar El Maaref (El Hussini and Demian)

Recommended Books:

Text book of Medical Physiology, 11th ed. 2006 Elsevier Inc (Guyton & Hall)

Invertebrate 2nd ed. 2002 (Richard C. Brusca). Practical animal biology part1&2, Dar El Maaref (El Hussini and Demian)

Campbell, N. A., et al. 1999. Biology. 5th edition. Benjamin/Cummings.

Phylum Porifera Grant, 1826. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness JOHN N.A. HOOPER, ROB W.M. VAN SOEST & ANDRZEJ PISERA

Class Mammalia Linnaeus, 1758. In : Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness D.E. WILSON & D.M. REEDER

Blackburn, D.C. & Wake, D.B. (2011) Class Amphibia Gray, 1825. In : Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness.

Zootaxa, 3148, 39–55. Chapman, A.D. (2009) Numbers of living species in Australia and the world. Second edition. – Australian Biodiversity Information Services, Toowoomba.

Daly, M., M.R. Brugler, P. Cartwright, A.G. Collins, M.N. Daws on, S.C. France, C.S. McFadden, D.M. Opresko, E. Rodriguez, S. Romano & J. Stake. (2007) The phylum Cnidaria: A review of phylogenetic patterns and diversity 300 years after Lin- naeus. In: Zhang, Z.-Q. & Shear, W.A. (Eds) (2007) Linnaeus Tercentenary: Progress in Invertebrate Taxonomy.

Zootaxa, 1668, 127–182. Queiroz, K. & Gauthier, J. (1994) Toward a phylogenetic system of biological nomenclature. Trends in Ecology & Evolution, 9, 27–31.

Dubois, A. (2006) Proposed Rules for the incorporation of nomina of higher-ranked zoological taxa in the International Code of Zoological Nomenclature. 2. The proposed Rules and their rationale. Zoosystema, 28, 165–258.

Dubois, A. (2007) Phylogeny, taxonomy and nomenclature: the problem of taxonomic categories and of nomenclatural ranks. Zootaxa, 1519, 27–68.

Dunn, C.W., Hejnol, A., Matus, D.Q., Pang, K., Browne, W.E., Smith, S.A., et al. (2008). Broad phylogenomic sampling improves resolution of the animal tree of life. Nature, 452, 745–749.

Edgecombe, G.D., Giribet, G., Dunn, C.W., Hejnol, A., Kristensen, R.M., Neves, R.C., Rouse, G.W., Worsaae, K. & Sørensen, M.V. (2011) Higher-level metazoan relationships: recent progress and remaining questions.

Organism Diversity and Evolurion, 11, 151–172.Emig, C.C. (2011) Phylum Phoronida Hatschek, 1888. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness. Zootaxa, 3148, 230–230
.Eschmeyer, W. & Fong, J. (2011) Pisces. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness. Zootaxa 3148, 26–38. Animalia

Supplemental text & lab reference – Lytle, C. F. 2000. General Zoology: Lab Guide. McGraw-Hill. (Will be used in **both lecture [later in the course] and lab** [earlier in the course than in lecture].)

Course Website(s)

www.zoossa.com.au
http://animaldiversity.ummz.umich.edu/site/index.html

Required Course Texts and Materials

Agriculture Zoology Syllabus

Paper I- Life general considerations and biological principles

1- Cell Biology: Structure and function of cell, Ultra structure of Plasma membrane , Structure and function of cell organelles

2- Classification of kingdom Animalia

Paper II –The Diversity of Animal life

Part 1-

Lower Non Chordata (*Protista to Helminths*)

The habits, morphology, physiology, reproduction, development (in outline) and classification of the following groups of animals including a detailed study of the types given in each:

Protista-	*Euglena, Monocystis* , and *Paramecium*
Porifera -	*Sycon –Ascon*
Coelenterata -	*Obelia,Hydra* and *Aurelia*
Platyhelminthes -	*Fasciola* (liver fluke) and *Taenia* (tape worm)
Nematehelminthes	*Ascaris*

Part 2 –

Higher Non Chordata (*Annelida to Echinodermata*)

The habits, morphology, physiology, reproduction, development (in outline) and classification of the following groups of animals including a detailed study of the types given in each:

Annelida *Nereis, Pheretima, Heteronereis, Arenicola* .
Arthropoda *Periplaneta*, *Anopheles* and *Cules*
Mollusca *Lamellidens*, Chiton, *Teredo, Turbinellai* (Shankh)
Echinodermata *Echinus* (Sea urchin), *Ophiothrix* (brittle star)

Part III:

Chordata

Hemichordata: Classification and detailed study (habit, morphology, anatomy, physiology and development) of *Balanoglossus*

Cephalochordata: Classification and detailed study (habit, morphology, anatomy and physiology) of *Branchiostoma* (*Amphioxus)*

Urochordata: Classification and detailed study (habit, morphology, anatomy, physiology and post embryonic development) of *Herdmania*

Classification of different classes of vertebrates (Pisces, Amphibia, Reptilia,) up to order with characters and examples. Poisonous and non poisonous snakes and biting mechanism. Neoteny

Classification of different classes of vertebrates (Aves and Mammalian) up to order with characters and examples. Dentition in mammals.

Paper III –Enviromental biology

Ecology, Animal Behavior and Pollution and Toxicology :

Ecosystem: Concept, components, fundamental operations, energy flow, food-chain, foodwebs and trophic levels, ecological niche, abiotic and biotic factors. Population: Characteristics and regulation. Ecological succession. Adaptation: Aquatic, terrestrial, aerial and arboreal .climate change.

Animal Behavior :Introduction to Ethology, Patterns of behavior (taxes, reflexes, instinct and motivation); biorhythms; learning and memory, Migration of fishes & birds.

Pollution and Toxicology: Concept, sources, types (air, water, soil, noise & radiation), and control of environmental pollution. Exposure of toxicants (routes of exposure, and duration and frequency of exposure); dose -response relationship categories of toxic e

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	20%
Exams	60%
Class attendance/participation	20%
Total Points	**100**

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	/10/20131	Course Overview Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	/108	Life general considerations and biological principles
3	15/10	Cell Biology, Structure and function of cell , Structure and fun of cell organelles.

4	22/10	Classification of kingdom Animalia
5	29/10	Organizing the Animal and The Diversity of Animal life
6	5/11	Lower Non Chordata (*Protista to Helminths*)
7	12/11	Higher Non Chordata (*Annelida to Echinodermata*)
8	19/11	Chordata
9	26/11	Vertebrata (Notochord is replaced by vertebral column)
10	3/12	Environmental zoology and ecology
11	10/12	Revision
12	17/12	Final assessment

Course	**Climatic Changes & Coastal Protection and Management**
Module 1	Beach profile configuration and its components
Key Concepts	Beach profile, Coastal zone, shoreface, Backshore, Beach berm and Shoreline
Overview	A beach profile represents the cross-shore morphology of the beach along the coast; it may extend out through the breaker zone and into deep water offshore (Komar, 1998) and the landward limit tends to end at the berm or backshore. An equilibrium beach profile represents a profile morphology

	which has adjusted its shape to the characteristics of the incoming waves (Bruun, 1954; Komar, 1998). Larson (1991) described the equilibrium beach profile for a beach of a specific grain size, its shape displays no net change in time when it is subjected to constant short-period breaking waves.
Aim	Beach profile equilibrium is the principal concept assumed by most numerical modeling. The response of beach profile configuration to natural and anthropogenic changes could be predicted to help in selecting the most appropriate engineering design required to mitigate coastal erosion and accretion alongshore.
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss the different part of beach profile • Discuss the equilibrium beach profile concept
Units	Unit 1.1 Coastal zone definitions and subdivisions Unit 1.2: Equilibrium beach profile
Readings	Dean, R.G., 1991. Equilibrium beach profiles: characteristics and applications. Journal of Coastal Research 7, 53–84. Kaiser, M.F.M., 2004. Monitoring and modeling the impact of engineering structures on coastline change, Nile Delta, Egypt. Ph.D. thesis, University of Reading, U.K. Komar, P.D., 1998. Beach Processes and Sedimentation, Second Edition. Prentice-Hall, Inc., New Jersey. 544 pp. Larson, M., 1991. Equilibrium profile of a beach with varying grain size. Proceedings of Coastal Sediments, American Society of Civil Engineers (ASCE) 27, 905–919. Kaiser, M.F. and Frihy, O.E. (2009). Validity of the equilibrium beach Nile Delta, Egypt. Geomorphology, 107, (1-2), Elsevier publication, 25-31.
Activity	**Overview** **Assignment.1:** - Manual drawing of beach profile configuration based on field measurements data

	- Comparison between eroded and accreted beach profiles - Grain size and beach profile configuration
Module 2	Factors controlling changes in beach profiles
Key Concepts	Waves, currents, tides, sea level and wind
Overview	Climatic change is one of the most important factors contributing to changes in patterns of shoreline evolution. The beach profile and planform shapes will be discussed in the preceding section are a result of the action of waves and currents at the shoreline. The waves not only suspend the sediments but give rise to nearshore currents that carry the suspended sediment a The sediment carried by the waves and currents is referred to as the *littoral drift*, and the amount of sediment moved along the coast is the *littoral transport*, or longshore sediment transport, which is usually measured in units such as cubic meters per year or cubic yards per year longshore or cross-shore. The *cross-shore transport*, which is caused by wave- or wind-induced mean crossshore flows, is largely responsible for the existence of sandbars and other beach profile changes. These changes can be slow, on the order of years in duration, or they can occur rapidly during storms with time scales on the order of hours.
Aim	The aim of this module is understand factors controlling beach profiles and coastline changes to suggest the suitable protective works along the beach. Recently, recreation and tourism at the shoreline have become more important economically, coastal development, taking the form of homes and businesses, population now lives within 50 miles of the coastline.
Learning Outcomes	At the end of this module learners will be able to: • Understand the main factors affecting coastline changes and beach profile configuration • Identify waves characteristics and its impacts of the beach
Units	Unit 2.1: Identify factors controlling coastal changes

	Unit 2.2: Field measurements data including, waves, currents, tides, etc. Unit 2.3: Impacts of waves characteristics on the patterns of shoreline changes
Readings	Komar, P.D., McDougal,W.G., 1994. The analysis of exponential beach profiles. Journal of Coastal Research 10, 59–69. Robert, G.D. and Robert, A.D. 2004. Coastal processes with Engineering applications, Cambridge University Press, 475pp. Kaiser, M.F. 2014. Disturbance of hydrodynamic regime in the Mediterranean coastal zone of Egypt. Journal of Coastal Research, In Press, DOI: http://dx.doi.org/10.2112/JCOASTRES-D-12-00247.1
Activity	**Overview**
	Assignment.2: Students in this assignment will construct and compare among measured, equilibrium and exponential beach profiles.
Module 3	Monitoring of coastline changes
Key Concepts	Shoreline positions, Patterns of shoreline changes, Shoreline field survey and Remote Sensing data.
Overview	Monitoring of coastal changes (erosion and accretion) is necessary in management in order to anticipate and provide scheme for mitigating potential problems. Generally, the most common sources for shoreline data include aerial photographs, historical maps and beach profiles. Satellite remote sensing is also a potentially powerful tool for detecting shoreline change at high spatial resolution and lower costs than those associated with traditional field-based methods (Jensen and Toll, 1982; El Raey, 1988).

	Shoreline positions established from beach profile surveys combined with wave data are jointly analyzed, as a function of their contribution to coastal processes, to investigate the interaction between waves, shoreline orientation and coastal structures. The coastline changes can be detected clearly by remote sensing that provides more details than ground surveys which mainly depend on the distance between the profiles (El- Raey et al., 1999). The interval distances between beach profiles measured in the field are usually ranging from 100 t 500 m, so data in between cannot be addressed. While, more detailed data can be extracted from the remote sensing, depending on its resolution.
Aim	This module aims at monitoring planform shoreline changes using remote sensing data.
Learning Outcomes	At the end of this module learners will be able to: • Using satellite images data to extract shoreline positions • Identify the patterns of erosion and accretion alongshore
Units	Unit 3.1: How the satellite image processing will be selected *Unit 3.2: Extracting vector data using ENVI software packages* Unit 3.3: *Vectors data integration using ArcGIS software package* Unit 3.4: *Recognizing the patterns of shoreline changes* Unit 3.5: Measuring the rates of coastline changes
Readings	El Raey, M. (1988). Remote sensing of environment. *Symposium of Enviror Science (UNARC), Alexandria, Egypt, Alexandria University, 1-19.* El Raey, M., Sharaf El Din, S. H., Khafagy, A.A. and Abo Zed, A. I. (1999). I sensing of beach erosion/ accretion along Damietta-Port said shoreline, *International Journal of Remote Sensing, **20**, 1087-1106.* Jensen, J. R. and Toll, D. L. (1982). Urban change detection mapping using I data. *The American Cartographer, **2**, 127-147.*
Activity	**Overview**
	Assignment.3: Students in this assignment will analyse remote sensing data (Enhanced Landsat Thematic Mapper images, 30m resolution) of the Nile Delta coastal

	zone for years 2000, 2005, 2010 and 2015. Vectors data for years 2000, 2005, 2010 and 2015 will be extracted. Detect and monitor the patterns of erosion and accretion along the Mediterranean coastal zone of Egypt in the Nile Delta beach.
Module 4	Types of protective work along the beaches
Key Concepts	Protective structures, seawalls, breakwaters, groins and jetties
Overview	The protective structures built to stabilize the shoreline are classified into tw types. The first is structures used to prevent waves from reaching the shore, especially in front of the harbours, such as seawalls and onshore breakwaters. The second type includes structures that retard the longshore transport of littoral drift such as detached breakwaters and jetties. The impact of human activities on coastal processes was studied intensively. However, much of this research was concerned with the design of structures rather than the impact of structures on the coastline changes following protection (Nordstrom, 1994). The shoreline deformation, the coastal instability and bottom changes reflect the natural effect of interrupted sediment supply, sediment transport processes, shoreline configuration, sea floor gradient as well as impact of the construction of protective structures.
Aim	This module aims at to identify the protective structures along the beach and its impacts on the coastline changes
Learning Outcomes	At the end of this module learners will be able to: • Identify the characters of each protective work • Understand positive and negative impacts of each engineering protection
Units	Unit 3.1: Types of protective coastal protection Unit 3.2: Advantages and disadvantages of each engineering work Unit 3.3: Selecting the optimal protective work along the beach

	Unit 3.4: Assessing the protective works along the Mediterranean coastal zone of Egypt, e.g., Nile Delta coastal zone.
Readings	Nordstrom, K.F. (1994). Developed coasts. *In: Coastal evolution Late Qua shoreline morphodynamics. Carter, R.W.G. and Woodroffe, C.D. (Editor) Syndicate of the University of Cambridge, 517pp.* Kaiser, M.F. 2014. Disturbance of hydrodynamic regime in the Mediterranean coastal zone of Egypt. Journal of Coastal Research, In Press, DOI: http://dx.doi.org/10.2112/JCOASTRES-D-12-00247.1
Activity	**Overview**
	Assignment.4: Students in this assignment will read a scientific research paper concerning with different types of protective structures and discuss together in its negative and positive impacts on the coastline changes. Students will suggest alternative protective work aiming to mitigate its negative impacts. **Assignment.5:** Reading the Manual of MIKE21 Models including M21 BW and M21 HD
Module 5	**Simulation of shoreline changes using modeling techniques**
Key Concepts	Sediment transport, boundary condition, Data input, sensitivity testing,
Overview	The evolution of shorelines and how their shapes relate to wave conditions and sources of sediment can be analysed using numerical simulation models. The results of the modelling can be compared to the measured shoreline changes indicated by the remote images. Numerical modelling can then be applied to analyse the impact of the construction of protective work on the shoreline configuration and to predict the patterns of erosion and accretion. The general approach underlying many simple models of shoreline change involves the use of three combined equations a) the continuity equation b) the transport equation and c) the equilibrium beach profile equation (Hanson and Kraus, 1989). MIKE 21 Boussinesq Wave (BW) module is mainly used to study wave dynamics (significant wave height, wave disturbance coefficient, water surface elevation and the depth-averaged particle velocity) in ports and

	harbours and in small coastal areas. The model has been primarily designed for coastal harbours but can also be applied to small and complex coastal embayments (Eurosion, 2004) and (DHI Software website, 2006). MIKE 21 Hydrodynamic (HD) simulates the water level variations and flows in response to a variety of forcing functions in lakes, estuaries, bays and coastal areas.
Aim	The main objectives of this module is application of 2D and 3D numerical modelling approach such as DHI software package to simulate shoreline changes, waves dissipation and hydrodynamic. Modelling simulation helps decision makers to suggest the optimal protective works which mitigate severe erosion and accretion along the coastal zones. In addition, prediction could be achieved based on calibration and verification procedures.
Learning Outcomes	At the end of this module learners will be able to: • Recognize different types of shoreline change models • Specify the suitable software for each case • Know the input data required for simulations
Units	Unit 5.1: Applications of shoreline changes modelling techniques Unit 5.2: Required data input Unit 5.3: Concepts and limitations of 1D GENESIS (Planform shoreline changes). Unit 5.4: Sensitivity testing Unit 5.5: Beach profiles changes Unit 5.6: DHI Software Models; Basic principles and Limitations
Readings	Hansons, H. and N.C. Kraus (1989): GENESIS: Generalized Model for Simulating Change, Report 1: Reference manual and User Guide. *Technical Report CERC, U.S. Army Engineer Waterways Experimental Station, Coastal Engineer Research Center, Vicksburg, Mississippi.* http://www.dhisoftware.com. DHI Software. Eurosion. (2004). Living with coastal erosion in Europe: Sediment and Space for Sustainability. A guide to coastal erosion management practices in Europe:

	lessons learned. Coastal erosion–Evaluation of the need for action. Directorate General Environment. European Commission. Prepared by the National Institute of Coastal and Marine Management of the Netherlands.
Activity	**Overview**
	This module will be given for students in cooperation with the Egyptian Public Authority for Shore Protection. **Assignment.6:** Students in this assignment will read Manual of 1D GENESIS and 2D &3D DHI software packages. **Assignment.7:** Using GENESIS 1D Planform shoreline changes model **Assignment.8:** Using DHI Wave models Using DHI Sediment Transport models **Assignment.9:** Using DHI Hydrodynamic models Using DHI Beach profile models

Name of the Course: Principals of Plant Protection

Course Description and Overview

Crops are attacked by a variety of pests that causes significant damage and losses in both quantity and quality. Crop protection is emerging as one of the key factors for food security and for the provision of enough food to the growing population. Nevertheless, some of the practices of crop protection, especially those related to the irrational use of pesticides have caused some potential damage to man and his environment.

Some major change in the state of the art was inevitable in order to keep the momentum of pest control, while saving environment and human health.
One of the expected repercussions of climate change is the new landscape of crop pests and diseases, with many new pest species emerging, and could cause considerable damage in places with no past experience in controlling them, pausing daunting challenges that should be addressed. Within the domain of the course, an introductory section portraying how the status of pest was developed for some insects, and the theories explaining this, and also how pest control tools emerged and developed. This part would also dwell on the drawbacks of the irrational use of chemical pest control agents, and the damage they inflect, and the emergence of new pest control paradigm "integrated pest management and crop hygiene". Sustainability and how to promote sustainable use of pest control methods as a basic framework of plant protection have special emphases in this part. Issues of considerable concern such as pest resistance to pesticides, environmental pollution and upsetting environmental biological balance are addressed in full details. In another section, pesticides used in pest control are introduced, including insecticides, fungicides, herbicides and others, with information about their classification and mode of action. A major constituent of this section is the study of pesticides formulations, their types, components and the purpose of their use are tackled in details.
In another section factors affecting the efficacy of pesticides are discussed with special reference to the role of soil type, chemical characters and some other factors.
The impact of climate change on pest landscape is another new issue that would be discussed in details, including how to cope and possible mechanisms, and expert systems that should be used.
Assignments, and group discussion are basic elements of the course, along with extensive field visits, field experiments, and laboratory practices.

Course Learning Objectives

The overarching goals of this course are: a) to provide information to assess the magnitude of pest infestation and pest damage
b) to provide information relevant to decision making for the timing for the use pesticides c) to provide information relevant to selecting proper formulation and proper conditions for the use of pesticides d) to provide information on how to cope with unexpected pests that might emerge as a consequence of climate change.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Understand the different methods of plant protection and diseases of different crops and to use pesticides in a rational way that would minimize side effects on man and environment

2- To have good information about available pesticides in the market and to be able to select the most effective with least side effects and to mix pesticides if necessary in a safe manner

3- To identify major pests, the damage they may cause and the proper timing and tools and to draw a plan for controlling pests

4- To control weeds, including aquatic weeds

5- To manage newly emerging pests based on his experience with similar pests and database information

Reading

-المبيدات الخضراء والمكافحة الامنة للافات . الجزء الثانى مجالات المبيدات الخضراء . د. ابوشبانة مصطفى عبد الرحمن. الدار العربية لنشر والتوزيع2010

2- الإستراتيجية المستقبلية لمكافحة (1982)

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	20%
Exams	60
Class attendance/participation	20%
Total Points	**100**

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

Students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than four classes. Students are expected to arrive on time and stay until the class period ends. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** General view of the course contents, requirements and reporting
2		Ecosystem types, ecosystem goods and services, agriculture ecosystem Plant protection and food security, a generic view, emergence of pests, ,
3		tools used for plant protection, past and development of methods use crop protection, irrational use of pesticides, drawbacks, emergence of paradigms, integrated pest management, crop hygiene, principal integrated pest management
4		Integrated pest management bases, introduction to pesticides classification, bioratonal pesticides, acute and chronic toxicity
5		Pesticides formulations,
6		Pesticides formulation, labelling, pesticides mix and compatibility
7		Factors affecting the efficacy of pesticides, timing, selection, cher properties

8		Fungicides, classification and mode of action
9		Herbicides, classification and mode of action
10		Herbicides, factors affecting efficacy, soil type, solubility, Herbicides selectivity, GM crops
11		Aquatic herbicides
12		Nematicides, acaricides
13		Rodenticides, and fumigants
14		Climate change and pest control, a generic view and how to cope with alien pests

COURSE SYLLABUS TEMPLATE

Course Description and Overview: Pollution of Water Resource

Industrial growth and development is beyond doubt, the major driver of economic progress and societal prosperity. Industry has always been the nuclei that communities and civic activities cascaded around, allowing all other activities to develop and cherish. Industry is also one of the major causes for environmental degradation, resources depletions and pollution. Environmental pollution is a daunting challenge casting its adverse influence on human prosperity and livelihood. Water pollution is one of the most serious types of pollution since pollutants of other spheres, including air and soil would normally end up in water. Within this course, an introductory part would deal with water and water bodies as one of the main ecosystem services, and major drivers of changes that affect this service. . This part would also entail an overview of global environmental changes, with special reference to climate change, acid rain.

The course would than elaborate on major sources of water pollution, including point and non point sources, along with the various types of potential water pollutants, including organic, non organic and biological pollutants, their emission source, and their impacts on the entire ecosystem. Studies are also focusing on the behaviour of particular pollutants, specially the persistent organic pollutants in water bodies, and their possible magnification in the environment, causing substantial damage to water quality, humans and water ecosystem.

Group discussion is frequently used to introduce different things and to establish iterative circles in which various topics are discussed and analyzed.
In one other section, the role of environmental management systems, including environmental impact assessment, water foodprint, green chemistry and other systems are introduced and their role in empowering sustainability of water is highlighted.
In another major section of the course, the role of microorganisms as a major pollutant of water is envisaged. Special emphases are laid on wastewater as a potential pollutant of water bodies, and methods of wastewater treatment are focused on

Course Learning Objectives

The overarching goals of this course would include:

A) to raise awareness of water pollution issues as a main source of poverty, sickness, environmental degradation, and to explore the role of global changes including climate change on water resources and water scarcity;
B) to identify major sources of pollution and major species of pollutants, and their impacts on water ecosystems;
C) to ascertain the role played by environmental management systems, including EIA, water footprint and others in improving water quantity and quality
D) the use of advanced techniques in wastewater treatment in order to use treated wastewater as a sustainable source of water, augmenting natural water supply and minimizing the impact of untreated wastewater discharged into water bodies.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- water as a valuable ecosystem service, and the various drivers of ecosystem change that might affect the quantity and quality of water with special reference to climate change, global warm up, and other factors
2- identify the source of water pollution in any particular area, and to evaluate the quality of water using indicator organisms
3- to draw an action plan to resort the vitality of polluted water body
4- to suggest alternatives for polluting agents
5- to use environmental management system with special reference to EIA as a planning process that should be employed to protect water bodies
6- water bacteriology, sampling of microorganisms, identification of coliform bacteria.
7- sound use of treated wastewater as a sustainable use of water

Course Resources

Required Course Texts and Materials

Aquatic Pollution: An Introductory Text
Edward Laws

Facing Up to Freshwater Pollution: We Are at a Turning Point as Momentous as the 1970s, When the Clean Water Act Was Enacted
Stoner, Nancy; Devine, Jon.

Pollution Prevention and Control
Human Health and Environmental Quality
Paul Mac Berthouex , Linfield C. Brown
http://bookboon.com/en/pollution-prevention-and-control-ebook

Water Quality Monitoring and Assessment
Edited by Kostas Voudouris and Dimitra Voutsa, ISBN 978-953-51-0486-5, 614
http://www.intechopen.com/books/water-quality-monitoring-and-assessment

The Greenhouse effect, Climate Change and the road to sustainability
Mohamed Tawfic Ahmed
http://grimstad.uia.no/puls/climatechange/

-Mohamed Tawfic Ahmed, Naglaa Loutfy, Maha Shoieb, and Yehia Mosleh
Residues of aliphatic and polycyclic aromatic hydrocarbons in lake Temsah, Ismailia, Egypt, an analytical search for hydrocarbons source and exposure bioindicators.
Human and Ecological Risk Assessment, September, 2013.
-M.S. El Sheirf, M. Tawfic Ahmed, M. A. Eldanasoury, and Nagwa El Nwishi
Effects of Pollutants on some Aquatic Organisms in Temsah Lake, Egypt
J. of Fisheries and Aquatic Science 4 (3), 150-160, 2009

-M.S. El Sheirf, M. Tawfic Ahmed, M. A. Eldanasoury, and Nagwa El Nwishi
Evaluation of diazanaon toxicity on Nile Telabia fish (O.niloticus)
J. of Fisheries and Aquatic Science, 4 (4), 169-17, 2009

-N. Loutfy, M. Fuerhackera, C. Lesueur M. Gartner, **M. Tawfic Ahmed** and A. Mentler Pesticide and non-dioxin-like polychlorinated biphenyls (NDL-PCBs) residues in foodstuffs from Ismailia city, Egypt,
-Pietro Tundo, Laila A. Reda, Yehia Y. Mosleh and **Mohamed Tawfic Ahmed**
Residues of PCDD, PCDF, and PCBs in some marine organisms in Lake Temsah, Ismailia, Egypt
Toxicological & Environmental Chemistry, January–March 2005; 87(1): 21–30

-Pietro Tundo, Stafano Raccannili, L. Reda **and Mohamed Tawfic Ahmed**
Distribution of polychlorinated dibenzo-p- dioxins, polychlorinated dibenzofurans, dioxin – like polychlorinated bipheny and polycyclic aromatic hydrocarbons in the sedimen of Temsah lake, Suez Canal, Egypt
J. Chemistry and Ecology, 2004, 20,257-265.

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Important Dates to Remember

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** General view of the course contents, requirements and reporting
2		Water, an ecosystem service, global view, supply and growing demand, climate change and impacts on water resources, other factors affecting supply, with special emphases on pollution
3		Water pollution, major sources of water pollution, point and non p organic and non organic, agricultural and industrial drainage Toxicity, type of toxicity, chronic and acute, how to measure, do response relationship, factors affecting type of toxicity, fat solubility, Partition coefficient,
4		Highlights of major pollutants, pesticides, heavy metals, persistent organic pollutants, behaviour in water, biomagnification and bioaccumulation, acidity and alkalinity
5		Other type of pollutants, including heat, oil, nutrients, ballasting water Pollution indicators, biological indicator, chemical and biochemical indicators,

6		Basic information about lakes including lake stratum, how to rejuvenate polluted lakes,
7		Environmental management system, risk assessment, water footprint Brief introduction to modelling
8		Water microbiology, biological indicators of water pollution,
9		Examination of water micorbioloogy, Water sampling, and detection of coliform bacteria
10		Wastewater treatment methodology, biological treatment conditions and limitations, conventional methods
11		Wastewater treatment methodology, biological treatment conditions and limitations, advanced methods
12		Water self purification, general aspects
13		Bioremediation, limitations and conditions
14		Bioremediation, with special reference to heavy metals

The CLIMASP Course Module

Course	***Environmental Studies***
Module 1	**Environment: Types and characteristics**
Key Concepts	Environment, types, Ecology, climate
Overview	This module covers definitions of different environments and monitoring the natural environment and the built environment characteristics and the impact on each other and the human relationship with them.
Aim	The overriding aim of this module is to turn students able to know different types of environment and definitions

Learning Outcomes	At the end of this module students will be able to: • Identify and discuss the different types of environment. • Identify definitions and basic terms of environment, ecology, climate
Units	Unit 1.1 The Environment Unit 1.2: Environments : Basic Terms Unit 1.3: The built environment
Readings	• Randall McMullan, "Environmental Science in Building", 7th edition, Palagrave Macmillan, 2012 p. 3-10
Activity	**Assignment 1.:** Connection between Environments 1. What is the natural Environment and its characteristics? 2. What is the built environment and its characteristics? 3. How do they affect each other?
Module 2	**Man and Climate: The climatic regions**
Key Concepts	Climate, climatic region, macro and micro climate
Overview	To achieve climatic environment that suitable for human comfort inside the building spaces, it must identify the climatic zone in which they live and analyze of its properties to benefit from the advantages and avoid disadvantages. It also must examine the impact of these climatic conditions on the building and try to take advantage of them or treated and controlled by the scientific studying of the architectural elements of the building. Therefore, this module concerns with the study of the geographical distribution of climate regions to find out the climatic characteristics of each region, which affect the architectural design of the buildings in this region.
Aim	The overriding aim of this module is to identify the characteristics imposed by the climate on architecture, especially in the hot zone to find the appropriate design solutions that suitable with the human comfort in the spaces of the buildings.
Learning Outcomes	At the end of this module students will be able to: • Identify and discuss the different climatic regions. • Find out the climatic characteristics of each region that affect the design • Identify definitions of climate • Identify the climatic characteristics of the hot zone

Units	Unit 2.1: The division of climatic regions Unit 2.2: The geographical of the hot / tropical zone Unit 2.3: The micro climate and its effect on the natural environment
Readings	• Shafaq El Wakeel and Mohammed Siraj, "Climate and Architecture of Tropical Zones," - Cairo 1989 • Koenigsberger, Ingersoll, Mauhew, Szokolay, "Manual of Tropical Housing and Building", Longman, London 1973
Activity	**Assignment 2**: The Climatic factors affecting the architectural design in hot region in general and Egypt in particular.
Module 3	**Climate Change & Sustainability**
Key Concepts	Climate Change, adaptation, mitigation , Sustainability development
Overview	Climate change is the greatest challenge facing human development which is affecting man all over the world. There is a mutual relationship between climate change an sustainable development, so it is important to identify this relation and how to deal with it, in order to reach the climate change mitigation
Aim	The overriding aim of this module is to enhance understandings of the Climate Change phenomena and its characteristics in Egypt, and what is the process to mitigate the effect of climate change.
Learning Outcomes	At the end of this module students will be able to: • Identify the Climate Change phenomena • Identify Sustainable development policy and principles • Understand the relationship between climate change an sustainable development
Units	Unit 3.1: Climate Change phenomena Unit 3.2: Climate Change: adaptation and mitigation Unit 3.3: Sustainable development policy
Readings	• Randall McMullan, “Environmental Science in Building”, 7th edition, Palagrave Macmillan, 2012

	• Egypt's National Strategy for Adaptation to Climate Change And Disaster Risk Reduction, UNDP, December 2011 • Sathaye, J., A. Najam, C. Cocklin, T. Heller, F. Lecocq, J. Llanes-Regueiro, J. Pan, G. Petschel-Held , S. Rayner, J. Robinson, R. Schaeffer, Y. Sokona, R. Swart, H. Winkler,: "Sustainable Development and Mitigation. In Climate Change" 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 2007
Activity	**Assignment 3**: The relationship between climate change an sustainable development
Module 4	**The climatic factors affecting the design: Temperature, Wind, Precipitation**
Key Concepts	Temperature, Wind, Precipitation
Overview	
Aim	The overriding aim of this module is to identify and study the climatic factors affecting the architectural design.
Learning Outcomes	At the end of this module students will be able to: • Identify the climatic factors affecting the design • Identify the means of thermal control • Proficiency in dealing with climate factors to reach the appropriate architectural design.
Units	Unit 3.1: Sun: Protection from the sun Unit 3.2: Temperature: Thermal quantities, heat exchange of buildings Unit 3.3: Means of thermal control Unit 3.4: Wind: local factors affect the wind movement, wind control Unit 3.5: Evaporation and precipitation and humidity Unit 3.6: Daylight : definitions, principles and design
Readings	• Shafaq El Wakeel and Mohammed Siraj, "Climate and Architecture of Tropical Zones," - Cairo 1989 • Koenigsberger, Ingersoll, Mauhew, Szokolay, "Manual of Tropical

	Housing and Building", Longman, London 1973 • Randall McMullan, "Environmental Science in Building", 7th edition, Palagrave Macmillan, 2012 • Robins, C., Daylighting Design and Analysis, Van Nostrand Reinhold Co., 1986. Avoidance. • Guzowski, M., Daylighting Sustainable Design, McGraw Hill, Co., 2000. • Brown, G. Z., Sun, Wind and Light, Architectural Design Strategies, John Wiley and Sons Inc., 2000
Activity	**Overview**
	Assignment 4: Monitor aspects of climate change in the region warm and its impact on sustainable development of the desert environment.
Module 5	**Renewable Energy and Architecture**
Key Concepts	Solar energy, passive and active solar, photovoltaic panels, wind turbines
Overview	Renewable energy is generally defined as energy that comes from natural resources such as sunlight, wind, rain… Solar energy refers primarily to the use of solar radiation for practical ends. However, all renewable energies, other than geothermal and tidal, derive their energy from the sun. Solar technologies are broadly characterized as either passive or active depending on the way they capture, convert and distribute sunlight. This module covers different types of renewable energies and its uses.
Aim	The overriding aim of this module is to increase awareness of using the renewable energy especially solar energy in building design
Learning Outcomes	At the end of this module students will be able to: • Identify the different types of renewable energies and its resources • Understanding the differences between types and its uses. • Recognize applications of renewable energies especially solar technology in the field of Architecture and urban planning
Units	Unit 5.1: Renewable energy: types, resources, uses Unit 5.2: Passive use of solar energy Unit 5.3: Applications of solar technology Unit 5.4: Renewable energy and climate change mitigation
Readings	• Shafaq El Wakeel and Mohammed Siraj, "Climate and Architecture of

	Tropical Zones," - Cairo 1989 • Randall McMullan, "Environmental Science in Building", 7th edition, Palagrave Macmillan, 2012 • IPCC. "Special Report on Renewable Energy Sources and Climate Change Mitigation". Cambridge University Press, Cambridge, United Kingdom and New York, United State, 2011
Activity	**Overview**
	• Research in groups, each group (2-3 students) • Each group chooses a heritage building in a particular climatic region • Studying of the architectural elements of the building and demonstrate the work theories of these different treatments • Analysing the building in terms of materials, construction, function and its suitability for the environment • Prepare a poster size 90 cm × 180 cm includes: • Theoretical study summarizes of the course • Applied and analytical Study of the heritage building, which was chosen
Module 6	**Analytical study of the heritage architectural elements**
Key Concepts	Architectural elements, heritage,
Overview	Traditional and heritage architecture is considered of an ideal model in the use of architectural elements that control climatic factors that affect the internal spaces in buildings. This differs from the use of elements such as dome, vaults, inner courtyard, Mashrabeya and other architectural treatments depending on the characteristics of the climatic region in which the building is located. This part interested in studying these architectural treatments in addition to the analytical study of some different models of heritage architectural buildings
Aim	The overriding aim of this module is to study the traditional treatments used in the architectural heritage and to learn how to use these architectural elements to control the climatic factors naturally
Learning Outcomes	At the end of this module students will be able to: • Identify the different types of heritage architectural elements

	• Understanding the differences between types and its uses. • Analyzing the different types of heritage architectural treatments • Recognize applications and different models of heritage architectural buildings
Units	Unit 6.1: Types of the heritage architectural treatments: Theory and function Unit 6.2: Analytical study of some different models of heritage architectural buildings
Readings	• Shafaq El Wakeel and Mohammed Siraj, "Climate and Architecture of Tropical Zones," - Cairo 1989 • Koenigsberger, Ingersoll, Mauhew, Szokolay, "Manual of Tropical Housing and Building", Longman, London 1973 • Using the websites
Activity	**Reviewing the research progress**

The CLIMASP Course Module

Course	**Urban Renewal of Residential Areas**
Module 1	**Urbanization and its problems**
Key Concepts	Urbanization, overpopulation, housing
Overview	This module covers definitions of urbanization and the overpopulation as it is considered one of the great problems facing cities and the consequences of severe problems such as lack of housing, the spread of deteriorating neighborhoods, the informal extensions, slums and pollution as well
Aim	The overriding aim of this module is to turn students able to raise awareness about urbanization and the problems resulting from it
Learning Outcomes	At the end of this module students will be able to: • Identify definitions and basic terms of urbanization • Identify and discuss rapid urbanization. • Identify and discuss the problem of the overpopulation
Units	Unit 1.1 Rapid urbanization : Overpopulation in Egypt Unit 1.2: Problem of urbanization

Readings	• Ahmed Kh. Allam, Yhya Shedid, Maged El Mahdi, "Urban Renewal," - Cairo 1997 • Forbes Davisdson and Geoff Payne, Urban Projects Manual, Liverpool University Press, 1996
Activity	**Assignment 1. :** The overpopulation in Egypt: Causes and its effect on urbanization.
Module 2	**Types of the residential areas**
Key Concepts	Housing, formal and informal housing, slums, deteriorated areas
Overview	This module covers the classification of the different types of residential areas in Egypt. The module discusses the characteristics of each type and the reasons for the appearance of this pattern.
Aim	The overriding aim of this module is to identify the characteristics of the different types of the residential areas in Egypt
Learning Outcomes	At the end of this module students will be able to: • Identify and discuss the different types of the residential areas • Find out the characteristics of each pattern • Analyzing the urban fabric of residential areas models
Units	Unit 2.1: The different types of the residential areas • Old deteriorated districts • Informal Housing • Shanty Towns & Dead Cities • The Historical Areas Unit 2.2: The urban characteristics of the residential areas Unit 2.3: The urban fabric of residential areas models in Egypt
Readings	• White, R and Whitney, J, "Cities and environment: an over- view. In Sustainable Cities: urbanization and the environment in international perspective", ed. R Stren, R White and D Whitney,1992 • Forbes Davisdson and Geoff Payne, Urban Projects Manual, Liverpool University Press, 1996
Activity	**Assignment 2**: Monitor and Analyze the types and urban fabric of the residential areas in Ismalia City.

Module 3	**The Urban Renewal Programs**
Key Concepts	Slum clearance, Redevelopment , Up- Grading , Conservation
Overview	This module covers and discusses the different systems and programs of the urban renewal for the residential areas, deals with the concepts, definitions and theories. Different objectives and programs of urban upgrading from project to another, but they are often deal with three main components: Economic activities, social services, and urban improvements
Aim	The overriding aim of this module is to find out the different systems and programs of the urban renewal for the residential areas
Learning Outcomes	At the end of this module students will be able to: • Identify and discuss the different and programs of the urban renewal • Find out the mechanism of each system • Analyzing the urban fabric of residential areas models
Units	Unit 3.1: The Concept of The Urban Renewal Programs Unit 3.2: Definitions and Theories Unit 3.3: Slum clearance and Redevelopment Unit 3.4: Up- Grading and Rehabilitation Unit 3.5: Historical Conservation
Readings	• Ahmed Kh. Allam, Yhya Shedid, Maged El Mahdi, "Urban Renewal," - Cairo 1997 • Turner, J. F. C, "Housing by People, Towards Autonomy in Building Environments", Marian Boyars, London, 1979.
Activity	• Research in groups, each group (3-5 students) • Each group chooses a residential area in Ismalia facing urban problems • Studying of its characteristics • Analysing the urban fabric • Choose the suitable renewal system to apply • Prepare a poster size 90 cm × 180 cm includes: • Theoretical study summarizes of the course • Applied and analytical Study of the chosen residential area
Module 4	**Sustainable urbanization and development**
Key Concepts	Sustainability, urban development, sustainable development

Overview	This module covers the concept of sustainable urban development and the impact of climate change on the cities.
Aim	The overriding aim of this module is to enhance understandings of the term sustainable urban development.
Learning Outcomes	At the end of this module students will be able to: • Identify and discuss the different and programs of the urban renewa • Find out the mechanism of each system • Analyzing the urban fabric of residential areas models
Units	Unit 4.1: Sustainable Urban Development Unit 4.2: Challenges facing Sustainable Urbanism Unit 4.3: Approaches to Sustainable Urban Development
Readings	• Ahmed Kh. Allam, Yhya Shedid, Maged El Mahdi, "Urban Renewal," - Cairo 1997 • Haughton, G and Hunter, ‘‘Sustainable Cities. Jessica Kingsley, London. 1994
Activity	Reviewing the research progress
Module 5	**The Urban Renewal Experiences**
Key Concepts	International , National Experiences
Overview	This module covers studying and analyzing the national and international experiences its advantages and disadvantages. The module demonstrates the implementation of the urban renewal projects in different countries.
Aim	The overriding aim of this module is to enhance understandings of the national and international experiences.
Learning Outcomes	At the end of this module students will be able to: • Identify the international Urban Renewal Experiences • Identify The national Urban Renewal Experiences • Find out and analyzing the mechanism and implementation
Units	Unit 5.1: The international Urban Renewal Experiences Unit 5.2: The national Urban Renewal Experiences
Readings	• Ahmed Kh. Allam, Yhya Shedid, Maged El Mahdi, "Urban Renewal," - Cairo 1997

	• Haughton, G and Hunter, "Sustainable Cities. Jessica Kingsley, London. 1994 • Payne, G,"Low Income Housing in the Developing World", Liverpool University Press, 1986. • Forbes Davisdson and Geoff Payne, Urban Projects Manual, Liverpool University Press, 1996.
Activity	Reviewing the research progress
Module 6	**Urban Renewal Legislations**
Key Concepts	Urban Legislations , laws, policy makers
Overview	
Aim	The overriding aim of this module is to identify and study
Learning Outcomes	At the end of this module students will be able to: • Identify the • Identify the means of • Proficiency in dealing with.
Units	Unit 6.1: The international Urban Renewal Legislations Unit 6.2: The national Urban Renewal Legislations
Readings	• Ahmed Kh. Allam, Yhya Shedid, Maged El Mahdi, "Urban Renewal," - Cairo 1997
Activity	Reviewing the research progress

The CLIMASP Course Module

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Aim	The overriding aim of this module is to turn students able to raise

	awareness about urbanization and the problems resulting from it
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Readings	• White, R and Whitney, J, "Cities and environment: an over- view. In Sustainable Cities: urbanization and the environment in international perspective", ed. R Stren, R White and D Whitney,1992 • Forbes Davisdson and Geoff Payne, Urban Projects Manual, Liverpool University Press, 1996
Activity	**Assignment 2**: Monitor and Analyze the types and urban fabric of the residential areas in Ismalia City.
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Activity	• Research in groups, each group (3-5 students) • Each group chooses a residential area in Ismalia facing urban problems

	• Studying of its characteristics • Analysing the urban fabric • Choose the suitable renewal system to apply • Prepare a poster size 90 cm × 180 cm includes: • Theoretical study summarizes of the course • Applied and analytical Study of the chosen residential area
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Units	Unit 4.1: Sustainable Urban Development Unit 4.2: Challenges facing Sustainable Urbanism Unit 4.3: Approaches to Sustainable Urban Development
Readings	• Ahmed Kh. Allam, Yhya Shedid, Maged El Mahdi, "Urban Renewal," - Cairo 1997 • Haughton, G and Hunter, "Sustainable Cities. Jessica Kingsley, London. 1994
Activity	Reviewing the research progress
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Key Concepts	International , National Experiences
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Aim	The overriding aim of this module is to enhance understandings of the national and international experiences.
Learning Outcomes	At the end of this module students will be able to:

	• Identify the international Urban Renewal Experiences • Identify The national Urban Renewal Experiences • Find out and analyzing the mechanism and implementation
Units	Unit 5.1: The international Urban Renewal Experiences Unit 5.2: The national Urban Renewal Experiences
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Activity	Reviewing the research progress
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Readings	• Ahmed Kh. Allam, Yhya Shedid, Maged El Mahdi, "Urban Renewal," - Cairo 1997
Activity	Reviewing the research progress

Marwa samir kamel Ali Mohamed
(Lecturer in plant protection department- faculty of Agriculture –Suze Canal University.)
Course Name: Agriculture zoology (Credits)

Number of modules: Theoretical (1) – Practical (2)

KNOWLEDGE (Concepts, theories, processes)	SKILLS (Tools, methodologies, dynamics)	ATTRIBUTES (Innate abilities)	CLIMASP CORE COMPETENCES
adaptation Economics of climate change Gender and climate change Science, impacts & scenarios Strategic planning Integrated assessment Vulnerability assessment Environmental awareness Environmental management Spatial decision tools Technology and innovation Consumer habits Anticipation and monitoring Risk assessment Gender-sensitive response to climate change Biodiversity and climate change Green economics Environmental economics Economics and growth Environmental awareness Vulnerability risk assessment Forecasting and scenario planning Spatial decision tools Biodiversity, ecosystems change Social learning	Systems thinking Anticipatory adaptation Validation and testing Dealing with uncertainty Prioritising Monitoring Reporting Anticipating risk Reducing vulnerability Risk assessment Impact assessment Futures thinking Local knowledge Risk prediction Critical thinking Crisis management Integrated assessment Costing and valuation Adaptive capacity Critical, systemic and futures thinking Spatial planning systems Problem solving Communicating Connecting Team management Ecological footprinting SWOT analysis Discourse	Optimism Openness to novelty and change Accountability Fairness Open-minded Proactive Organised Decisive Democratic Responsible Empathy Perspective Co-responsibility Systematic Focussed Confident	1. Identify and categorise local livelihood assets and resources. . 2. Gain an overview and quantify climatic hazard risk and resilience capacity of local communities. 3. Identify and assess the effectiveness of the current coping mechanisms practiced by communities to secure and improve their livelihoods and 4. conserve ecosystem bio-diversity in the context of climate change. 5. Explore the institutional context in which the community operates and identify appropriate institutional partners for adaptation. 6. Develop urgent and immediate short term and long term adaptation priorities for district, regional and national level planning. 7. Identifying and nurturing collaborative partnerships either within an organisation or in the wider community to create common purpose to resolve systemic problems. 8. Questioning business as usual can threaten our ideals, values, beliefs, business strategies and technical understanding and is not necessarily what everyone wants to hear. 9. Dealing with values and ‘big picture’ sustainability is outside the comfort zone of many people in the workplace. 10. Understanding sources of risk and insecurity, their impacts on livelihoods and application to building resilience (to climate and natural resource shocks, food and nutrition insecurity, political economy and in fragile contexts). 11. Knowledge and application of analytical tools, ways of working

processes	Debating Advocating		and evidence, innovation and learning. 12. Compare local problems with problems elsewhere and to gain adaptation ideas from this comparison. 13. Anticipate possible future environmental change and identify possible development consequences. 14. Analyse and evaluate complex and sometimes competing environment and development issues and integrate these into practical, balanced and sustainable solutions. 15. Evaluating the risks that climate change poses to economic development and evaluating potential adaptations that address risks to economic development 16. Be able to give local examples of the effects of climate change on agriculture and how producers might help adapt to climate change. 17. Evaluating the risks that climate change poses to public health and quality of life and evaluating potential adaptations that address risks to public health and quality of life. 18. Determine what happens with climatic variations, which components are most vulnerable and how they are affected. 19. Knowledge and understanding of tools and mechanisms for achieving sustainable development and green growth. 20. Build linkages between poverty reduction, MDGs, macroeconomic policies, environment, energy, climate change and sustainable development. 21. Able to carefully and systematically examine research to judge its trustworthiness and its value and relevance in a particular context and other potential sources of evidence. 22. Able to interpret, use and present data and evidence in defining policy and practice. 23. Able to design, commission and manage evaluations including rigorous impact evaluations. 24. Assess and monitor impacts of climate variability and climate change on agriculture, forestry and fisheries and the livelihoods that rely on these sectors, taking into account socio-economic scenarios and drivers of change in agricultural sectors per major

			eco-region. 25. Develop and disseminate guidelines, methodologies and tools for collection, processing and analysis of climate change-related data and information, and strengthen databases for use in impact and vulnerability assessments and adaptation. 26. Communicate information and promote equitable access of rural people and institutions to information related to impacts of climate variability and change and adaptation in the agriculture, forestry from global to local levels, and vice versa through appropriate channels. 27. Document, evaluate and disseminate successful experiences in sustainable natural resources management, agriculture and food production and gender and rights-based adaptation strategies and practices. 28. Advocate at the regional and international level for a stronger recognition of the challenges to and potential of agriculture, forestry and fisheries sectors in climate change adaptation frameworks and financing mechanisms, and ensure that main stakeholders, including indigenous people and vulnerable groups, have a voice in advocacy. . 29. Reinforce national and regional capacities for plant, forest and animal health and food safety and improve monitoring and control of variations in pests, diseases and food safety, related to climate change. 30. Strengthen food value chains and, in particular, improve small-scale producers' access to markets to increase resilience of food systems. 31. Understand the concept of 'footprinting', for example, the 'carbon footprint' and 'ecological footprint' of individuals and organizations; the different methods of footprinting; and the advantages and disadvantages of each. 32. Use systems and 'futures' thinking allows us to better

			appreciate the natural and social systems that come together and interact in the built environment. 33. Use techniques for resolving or avoiding conflict in an ethical manner and know where to get help if ethical dilemmas arise. 34. Ability to translate scientific climate information into policy and practical guidance .

Course Syllabus

Environmental Studies

ARCH 42X- Elective 9

Suez Canal University, Faculty of Engineering,
Department of Architecture and Urban Planning,
Second Semester, 2014-2015

Instructor Information

Instructor: Dr. Mervat Abdel Aziz M. Nasr
Office Location: SCU Campus
Telephone: -
Office Hours: Mon 12:00 pm- 01.00 pm, Wed 09:00 am- 12.00 pm
E-mail: Mervat_Nasr@eng.suez.edu.eg
Website:

Course Identification

Course Number: ARCH 42X- Elective 9
Course Name: Environmental Studies
Course Location: University Campus
Class Times: ---
Prerequisites: ----
Faculty Web Page: http://www.scuegypt.edu.eg/

Course Description/Overview

The course covers the study and definition of different environments and monitoring the natural environment and the built environment characteristics and the impact on each other and the human relationship with them. The course includes:

- The concept of the environment and its relationship to human beings (natural environment and the built environment)
- Climate Change & Sustainability
- Geographical division of the climatic regions in the world and considerations for human thermal comfort
- Climatic factors affecting the design
  (Sunlight - Temperature - wind - natural lighting - evaporation and humidity and precipitation)

- Models, examples and analysis of the heritage architectural elements

Course Learning Objectives

The overarching goals of this course are:

- Identify the different environments (the natural environment - the built environment).
- Identify the manifestations of climate change and sustainable principles.
- Learn the climatic factors influencing the design.
- Raise awareness of different types of environmental treatments through studying and analyzing models of local and heritage architecture.
- Acquire the skill of analyzing environmental factors to raise the efficiency of the environmental performance in the buildings.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

40. Knowledge of various environmental treatments.
41. Proficiency analysis of climatic and environmental factors affecting the architectural design.
42. Mastering the skill of design elements and architectural treatments verify control climatic factors
43. Apply principles of sustainability on the architectural design.

Course Resources

Required Course Texts and Materials

- Shafaq El Wakeel and Mohammed Siraj, "Climate and Architecture of Tropical Zones," - Cairo 1989
- Koenigsberger, Ingersoll, Mauhew, Szokolay, "Manual of Tropical Housing and Building", Longman, London 1973
- Randall McMullan, “Environmental Science in Building”, 7th edition, Palagrave Macmillan, 2012
- Robins, C., Daylighting Design and Analysis, Van Nostrand Reinhold Co., 1986. avoidance.
- Guzowski, M., Daylighting Sustainable Design, McGraw Hill, Co., 2000.
- Brown, G. Z., Sun, Wind and Light, Architectural Design Strategies, John Wiley and Sons Inc., 2000.

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Class attendance /Assignments & presentation	20%
Half Exam	20%
Final research and poster	30%
Final Exam	30%
Total Points	**100**

Course Policies

Classroom Protocol

- Students must attend all lectures on time.
- Students must be active class participation, which counts for 20% of the grade.
- Students must adhere to submit duties and assignments in time according the schedule to avoid deduction grades of delay.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Half Exam	Week 8
Final research and poster	Week 15
Final Exam	Week 16

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Environment: Types and characteristics
3		Man and Climate: The climatic regions
4-6		Climate Change & Sustainability
7-9		The climatic factors affecting the design: Temperature, Wind,

		Precipitation
9-11		Renewable Energy and Architecture
12-13		Analytical study of the heritage architectural elements
14-15		Final presentation of the researches and posters
16		Final Exam

APENDIX II: The CLIMASP Course Modules Template Example

Course	**Curriculum and Hypermedia**
Module 1	**Dynamic Earth and Earth systems**
Key Concepts	Dynamic Earth, plate tectonic, continental drift, sea floor spreading
Overview	This module briefly explains how and why Earth's surface, and its interior, are constantly changing. It relates this constant change to the major geological topics of interaction of the atmosphere, water and rock, the modern theory of plate tectonics. In the early 1960s, the emergence of the theory of plate tectonics started a revolution in the earth sciences. Since then, scientists have verified and refined this theory, and now have a much better understanding of how our planet has been shaped by plate-tectonic processes. We now know that, directly or indirectly, plate tectonics influences nearly all geologic processes, past and present.Plate tectonic theory affects all of us because it explains where and why such natural disasters as earthquakes, volcanic eruptions, and tsunami occur as well as the formation and distribution of many economically valuable natural resources.
Aim	An appreciation of how the Scientific Method relates to the development of the Theory of Plate Tectonics.

Learning Outcomes	At the end of this module learners will be able to: • Contrast the concept of catastrophism and uniformitarianism. • Describe the earth's basic internal structure. • Describe the basic types of plate boundaries (divergent, convergent, transform) and describe the relative motions of each. • Discuss the driving mechanisms that might cause plate motion (Thermal convection, mantle plumes, hot spots). • cite the lines of evidence in support of the Plate Tectonics Theory, Continental Drift and Sea floor Spreading.
Units	Unit 1.1 Earth system Unit 1.2: Continental drift Unit 1.3: Sea floor spreading, wonder of poles Unit 1.4: Plate Tectonic Unit 1.5. Earth Science Literacy Principles
Readings	Tarbuck, E.J. and Lutgens, F.K. (2012) Earth science 13th ed., Prentice Hall, New Jersey, Ch 7. James S. Monroe, Reed Wicander, and Richard Hazlett (2007) Physical Geology: Exploring the Earth, 6th ed, ch. 2: 33-69
Activity	**Overview** Assignment 1.1 to 1.4 • The history of the concept of plate tectonics is a good example of how scientists think and work and how a hypothesis can be proposed, discarded, modified, and then reborn. Discuss the evolution of an idea - how the earlier hypothesis of moving continents (continental drift) and a moving sea floor (sea-floor spreading) were combined to form a theory of plate tectonics • possible connections between plate tectonic behavior and climate change, because plate tectonics influences the cycling of material throught the earth's crust.
	Assignment 1.5 According to Earth Science Literacy Principles: discuss in deails the

	following statements:- • Civilization exist by geologic consent, subject to change without notice • Humans signifanly alter the earth/
Module 2	**Earth Material**
Key Concepts	Extrusive and intrusive Igneous rocks, weathering, sedimentary rocks, soil, metamorphic rocks
Overview	Plutonism is igneous activity at depth in the crust, which produces the intrusive igneous rocks. In volcanism, ash and lava are erupted and extrusive igneous rocks are formed as the ejected material cools rapidly. These processes are associated primarily with three plate-tectonic settings On the continents, the circulation of the atmosphere weathers, transports, and deposits sediments by wind, water, and ice. Subsidence of an oceanic plate causes deposition, burial, and lithification of sediment transported from the continents. Metamorphism and uplift occur where continental plates collide at convergent boundaries. These collisions uplift mountains and create the great pressures and temperatures that metamorphose rocks.
Aim	Development of skills to recognize major rock types, their constituent minerals, and their origin.
Learning Outcomes	At the end of this module learners will be able to: • Identify examples of intrusive and extrusive rocks • Differentiate between chemical and physical weathering • Classify clastic and non-clastic sediments • Introduce metamorphic agents, processes, protoliths and types of metamorphism.
Units	Unit 2.1: Igneous rocks. Unit 2.2: Weathering and soil formation Unit 2.3: Sedimentary rocks. Unit 2.4: Metamorphic rocks
Readings	

	Buol, S. W., F. D. Hole, R. J. McCracken, and R. J. Southard. 1997. *Soil Genesis and Classification. 4th ed.* Ames, IA: Iowa State University Press. Diane H. Carlson, Charles C. Plummer, Lisa Hammersley (2011) Physical geology: earth revealed.—9th ed. /
Activity	Identify and classify minerals and rocks
	• Design a plan to maintain balance between the increment of mineral and rock consumption and our limited resources (DEPLETION OF INDUSTRIAL MATERIALS). • Describe the types of environments where sedimentary rocks are formed. • Describe sedimentary structures. • Explain the significance of fossils in sedimentary rocks. • Relate the rock cycle with plate tectonic setting
Module 3	• **Force within (Deformation, Earthquakes)**
Key Concepts	Stress Strain, Fault, joint, fold
Overview	Rocks deform in response to differential stress. Some rocks are brittle, others are ductile, and the same rock can be brittle at shallow depths and ductile deep in the crust. • Rock type affects the way rocks deform. In particular, the old, hard igneous and metamorphic rocks that form the crystalline basement act as brittle materials, fracturing along fault planes in earthquakes, while the younger, softer sediments that overlie them fold gradually as ductile materials To understand earthquakes, for instance, one must know about faults. Appreciating how major mountain belts and the continents have evolved calls for a comprehension of faulting and folding. Understanding plate tectonic theory as a whole also requires a knowledge of structural geology. (Plate tectonic theory developed primarily to explain certain structural features.) In areas of active tectonics, the location of geologic structures is important in the

	selection of safe sites for schools, hospitals, dams, bridges, and nuclear power facilities. Also, understanding structural geology can help us more fully appreciate the problem of finding more of Earth's dwindling natural resources
Aim	An understanding of three-dimensional analysis of Earth structures, and the stresses that produce them along with how major landforms relate to geological processes.
Learning Outcomes	At the end of this module learners will be able to: • Know the difference between **elastic, brittle, and plastic deformation** in rocks • Describe the cause of earthquakes. • Describe how an earthquake epicenter is located, how the magnitude of an earthquake is determined • Discuss the status of earthquake prediction, can Earthquakes be Controlled?
Units	Unit 3.1: Deformation: Stress and strain; Folds, Fractures and faults *Unit 3.2: Earhquake:* Causes and seismic waves Global distribution, effects, and plate kinematics
Readings	Lisle, R. (2004) Geological Structures and Maps: A practical guide. 3rd ed. Elsevier Butterworth-Heinemann, 106p Platt, J. (1970) A series of elementary exercises upon geological maps. Thomas Murby & Co Reichard, J. S. (2011) Environmental Geology / James S. Reichard. -- 1st ed. Part 2-Ch.5
Activity	**Overview**
	3.1. Based on geologic maps excersies, (rock formation and geologic structure. □ What are the definitions of **strike and dip**. From a cross-section (road-cut exposure) of beds, be able to recognize an **anticline** and a

syncline. Also, from a cross section, be able to recognize an **overturned fold**, an **open (normal or symmetrical) fold**, a **recumbent fold**, and an **isoclinal fold**. Know how to identify an anticline and syncline by the **relative age of beds exposed in their surface outcrops**. Be able to recognize an anticline, syncline, dome, and basin from a surface map showing **strike and dip symbols**. Know how to use the **nose of a plunging fold** on a surface outcrop to determine the direction an anticline or syncline is plunging.
Know the difference between **strike slip** and **dip slip** movement on fault planes? What types of stress creates a normal fault and reverse faults. Be able to identify in cross-section: a **reverse fault**, a **normal (gravity) fault**, and a **thrust fault**; and from surface view: a **left lateral strike slip fault** and a **right lateral strike slip fault**. At **which plate boundary** would you expect to find strike slip faults, to find reverse faults, and to find normal faults?

3.2. Assignment

- About 95 percent of the energy released by earthquake is concentrated in narrow zone that wind around the globe.

a. Discuss the difference between earthquake intensity and magnitude.
b. How are faults, foci, and epicenters are related?
c. Elaborate the factors that affect amount of Ground Motion?

- What is the seismic risk of Suez Canal district? How safe or unsafe the infrastructure and big projects (Bridge/tunnel)? Upon what factors would your answer depend?

Module 4	**Sculpturing Earth's Surface**
Key Concepts	Chemical, physical weathering, soil, mass wasting
Overview	Minerals making up igneous rocks crystallize at relatively high temperatures and sometimes at high pressures as magma and lava cool. Although these minerals are stable when they form, most of them

	are not stable during prolonged exposure at the surface. Explore some of the interactions between the climate and plate tectonic systems. The systems interact to give us three geologic processes that break down and fragment rocks and transport these products over short distances: weathering, erosion, and mass wasting. These processes are the first steps in flattening mountains that have been uplifted by tectonic processes. When material on a hillside has weathered, it is likely to move downslope because of the pull of gravity. Soil or rock moving in bulk at Earth's surface is called mass wasting. Mass wasting is one of several surficial processes. Other processes of erosion, transportation, deposition - involving streams, glaciers, wind, and ocean waves - are discussed in following modules we describe how different types of mass wasting shape the land and alter the environment and what factors control the rapidity or slowness of the process. Understanding mass wasting and its possible hazards is particularly important in hilly or mountainous regions.
Aim	The overriding aim of this module is first to explore the process change the earth surface with the focus on weathering and mass wasting
Learning Outcomes	At the end of this module learners will be able to: • Explain the difference between mechanical and chemical weathering. • Discuss soil composition, texture, structure, formation, and classification. • Describe the controls of mass wasting. • List and describe the various types of mass wasting.
Units	Unit 4.1: Weathering and soil formation Unit 4.2: Mass wasting
Readings	Carlson, D., Plummer, C., Hammersley, L. (2011) Physical geology: earth revealed.—9th ed, Ch. 12&13

Activity	**Overview**
	Assignment: 4.1 Land degradation is world wide environmental problem, what was damage in the past we can`t restore. Land degradation includes soil erosion, desertification, and salinization. Discuss briefly 4.2 • What triggers mass wasting? Discuss the methods prevent it. • The crisis took place in Mokattam Plateau few years ago is one form of mass wasting. Discuss briefly the causes of mass movement and preventive measures.
Module 5	**Water system**
Key Concepts	River, ground water, pollution, aquifer, coast, ocean
Overview	The module also discuss the causes and effects of flooding, and various measures used to control flooding . Surprisingly, water underground is about 60 times as plentiful as fresh water in lakes and rivers on the land surface (not including water stored as ice in glaciers). Groundwater is a tremendously important resource. How it gets underground, where it is stored, how it moves while underground, how we look for it, and, perhaps most important of all, why we need to protect it For most of human history, the 71 percent of Earth's surface covered by the oceans was a mystery. The large populations who lived at the edge of the sea knew well the impact of the waves, the rise and fall of The energy of the waves comes from the wind. This energy is used to a large extent in eroding and transporting sediment along the shoreline. Understanding how waves travel and move sediment can help you see how easily the balance of supply, transportation, and deposition of beach sediment can be disturbed. Such disturbances can be natural or human-made, and the changes that result often destroy beachfront

	homes and block harbors with sand.
Aim	The overriding aim of this module is first to Understand how freshwater originates and moves within the hydrologic cycle either as surface water or underground water. secondly, explore some of the natural processes and hazards that occur along coastlines, focusing on how humans interact with this unique environment.
Learning Outcomes	At the end of this module learners will be able to: • Discuss a river process (erosion, transportation and deposition) and a river feature • Flood hazard reduction • Describe the character and behavior of groundwater in various settings. • Discuss environmental problems related to groundwater • Describe wave erosion and the features produced by wave erosion. • Discuss shoreline erosional problems and solutions.
Units	Unit 5.1: Surface Water (transport from mountains to oceans) Unit 5.2: Underground water Unit 5.3: Coastlines and Ocean Basins
Readings	A compilation of hands-out, Grotzinger, J., Jordan, H., Press, F., and Siever, R. (2007) Understanding Earth. W. H. Freeman and company. Ch. 17, 18, 20

	Reichard, J. S. (2011) Environmental Geology / James S. Reichard. 1st ed. Part 2-Ch.9
Activity	**Assignment** 5.1. The impact of Grand Ethiopian Renaissance Dam on climatic change. The environmental impact of Grand Ethiopian Renaissance Dam on Egypt.
	Assignment 5.2. What groundwater problems might be encountered in your region? Write a brief description of each of the problems. Can you think of potential solutions to these problem? 5.3. The effect of global warming on Egyptian delta and sea rise especially after establishing High dam!
Module	**Global Climatic change**
Key Concepts	Milankovitch cycles, greenhouse effect
Overview	**Climate change and global warming are** potentially our most serious environmental issues today because human existence is so intimately tied to the planet's climate system. Earth's position within the solar system's habitable zone resulted in an atmosphere and a climate system that are ideal for complex plant and animal life because temperatures fall within the relatively narrow range where liquid water can exist at the surface..
Aim	The overriding aim of this module is to help students realize the causes of global warming due to release of green house gases, understand mitigation methods
Learning Outcomes	At the end of this module learners will be able to: • Explain how the greenhouse effect operates. • Describe how humans have disrupted the carbon cycle and how this affects the climate system. • Know how climate change can be triggered by orbital variations,

	and then amplified by positive feedbacks. • Describe the role the oceans have in shaping Earth's climate and weather patterns. • Explain how the study of glacial ice has led to a better understanding of the climate system • Describe the basic mitigation strategy for reducing carbon dioxide emissions and why it is imperative to begin making immediate and significant reductions.
Units	Unit 6.1: Global warming
Readings	Reichard, J. S. (2011) Environmental Geology / James S. Reichard. 1st ed. Part 2-Ch.16 Goudie, A. (2006) The Human Impact: On The Natural Environment Past, Present, And Future. Blackwell Publishing. 6th ed.
Activity	**Overview**
	Assignment: An appreciation of origin of major geologic hazards and their impacts. An understanding of three-dimensional analysis of Earth structures (big and small), and the stresses that produce them along with how major landforms relate to geological processes.

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number:

Physical Geology (GE107)

Suez Canal University, Faculty of Science

Spring Semester, 2014-2015

Instructor Information

Instructor: Dr. Salah Shata

Office Location: Suez Canal University

Telephone: Office – +30 28310 77625

Office Hours: Saturday 8:30- 12:00, Thursday 8:30- 12:00

E-mail: salah215@hotmail.com

Website:

Course Identification

Course Number: **GE107**

Course Name: **Physical Geology**

Course Location: University Campus (Auditorium 1)

Class Times: Wednesday 9:00– 11:00am, lab (Wednesday 4:00-6:00pm)

Prerequisites: Non

Faculty Web Page:

Course Description/Overview

"Earth is a unique place, home to more than a million life forms, including ourselves. No other planet yet discovered has the same delicate balance necessary to sustain life. Geology is the science that studies the Earth -- how it was born, how it evolved, how it works, and how we can help it." [Press and Siever, Third Edition, 2001]

This course will further your understanding of, and ongoing curiosity about the Earth: what it's made of, its landforms, and the dynamic processes that have created and repeatedly changed the landscape (and ocean basins) through time. We will be exposed to the breadth of geology and its connections with the other major sciences, including chemistry, physics, meteorology, astronomy, and biology. As a resident of Earth, we can experience, observe, read about, and/or use much of what will be covered in course, regardless of what career paths we might take. At this time, we are fortunate to be witnesses to revolutionary changes in our understanding of the Earth's processes. These revolutions are going on in plate tectonics, Earth systems, Earth history, and more. We will cover these topics plus find out where we can access geologic information as life-long learners.

Course Learning Objectives

This course aims to provide the basic knowledge about the different internal and external processes taken place in the plant Earth. Types of these processes, their magnitude, duration and resultant landforms. Also how human being is affect by these processes as well as how human disrupt geologic process balance.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

The goals of this course are to enable the student to understand the Earth and Earth processes so that the student will be able to:

1. Read the landscape for the story of its evolution, development, hazards, potential and likely future given common Earth surface processes.
2. Interpret hazards and resource opportunities posed by geologic environments created through plate tectonic and Earth surface processes such as earthquakes, volcanoes, river valley evolution, coastal processes, and climatic change.
3. Describe the interaction and interdependence of the geologic environment and human activity at the societal level.
4. Participate meaningfully in public discussion of geoscience issues correctly using the methods and data of science.
5. An appreciation of origin of major geologic hazards and their impacts

Course Resources

Course Website(s)

http://bcs.wiley.com/he-bcs/Books?action=index&bcsId=5682&itemId=1444334603
http://education-portal.com/academy/course/physical-geology-course.html

Required Course Texts and Materials

Hands-out prepared by the instructor for the class

David McGeary, Charles, M.Plummer, Diane H.Carlson (2001) Physical Geology, earth revealed.**4th ed.** McGraw Hill. 578p.

Diane H. Carlson, Charles C. Plummer, Lisa Hammersley (2011) Physical geology: earth revealed.—9th ed.

Lisle, R. (2004) Geological Structures and Maps: A practical guide. 3rd ed. Elsevier Butterworth-Heinemann, 106p

Platt, J. (1970) A series of elementary exercises upon geological maps. Thomas Murby & Co.

Press, F. and Siever, R. (2001) Understanding the Earth. 3rd Edition.

Reichard, J. S. (2011) Environmental Geology / James S. Reichard. 1st ed. Part 2-Ch.5,9

Tarbuck, E.J. and Lutgens, F.K. (2012) Earth science 13th ed., Prentice Hall, New Jersey,

Optional Course Texts and Materials

Buol, S. W., F. D. Hole, R. J. McCracken, and R. J. Southard. 1997. *Soil Genesis and Classification. 4th ed.* Ames, IA: Iowa State University Press.

David McGeary, Charles, M.Plummer, Diane H.Carlson (2001) Physical Geology, earth revealed.**4th ed.** McGraw Hill. 578p.

Assignments and Grading Scheme

Grading System

Student should score in every item

Grading Policy

Grades can be based on the following: (Example)

Assignments	20%
Exams	60
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	24/9	**Course Overview** Internal structure of the earth, Continental drift
2	1/10/2014	Sea-Floor Spreading, Plate tectonic
3	8/10	Earth Science Literacy Principles
4	15/10/2014	Volcanism, magmas and igneous rock
5	22/10	Weathering, Sedimentary Rocks, Soil
6	29/10	Metamorphic rocks, rock cycle, relationship between rock cycle and plate tectonics
7	5/11	Geologic time, Deformation
8	12/11	Fault, Fold, Joints
9	19/11	Earth quakes
10	26/11	Mass wasting
11	3/12	Running water process
12	10/12	Ground water activity

13	17/12	Ocean costal process
14	24/12	Global warming

Template No (12)
Course Specification

University/Academy: Suez Canal University
Faculty/Institute: Faculty of Sciences
Department: Geology

1-Course data		
Code: GE 318	**Course Title:** Coastal protection and management	**Academic year/ Level:** 3rd level
Credit/ Taught Hours: 3 **Theoretical: 2** **Practical: 2**		**Department/program:** Geology

2- Course aim	This course aims to provide the basic information about beaches, coastal processes controlling beach changes, monitoring coastline changes using field measurements and remote sensing. The course acquire the student the necessary skills concerning the techniques, types of engineering structures built to protect the coasts, impact of each type on the pattern of shoreline changes, numerical modeling approaches used to simulate and predict coastline changes.

3- Intended Learning Outcomes (ILOs):	
A- Knowledge and understandings:	**The students will be able to:** a1- Recognize the main parts of beach profile. a2- Recognize the factors controlling beach configuration. a3- Acquire the different types of engineering protection a4- Recognize the impact on the patterns of coastline changes.
B- Intellectual Skills:	**At the end of the course, the students will be able to:** b1- Draw cross-shore beach profiles from field measurements and detecting its components. b2- Differentiate between eroded and accreted beach profiles b3- Detect the relationship between the pattern of coastline changes and beach profile configuration, b4- detect coastal changes from satellite image data
C- Professional Skills:	**At the end of this course, the students will be able to:** c1- Use the types of soft-wares used to simulate shoreline changes c2- Assess the impact of engineering structures built at some sites in Egypt. c3- Evaluate the possible engineering structures used to get positive impact along the beach and neighboring areas
D- General Skills:	**At the end of the course, the students will able to:** d1- Mitigate coastal problems d2- Deal with software used for modeling simulation and prediction d3- Simulate the most appropriate methods for coastal protection

4- Course content: (theoretical and then practical)

Theoretical part content

Topic	No. of Hours	Week(s) No.	No. of Lecture(s)
Beach profile configuration and its components. Unit 1.1 Coastal zone definitions subdivisions Unit 1.2: Equilibrium beach profile	4	1,2	One
Factors controlling changes in beach profiles. Unit 2.1: Identify factors controlling coastal changes Unit 2.2: Field measurements data including, waves, currents, tides, etc. Unit 2.3: Impacts of waves characteristics on the patterns of shoreline changes	4	3,4	Two
Shoreline positions, Patterns of shoreline changes, Shoreline field survey and Remote Sensing data. Unit 3.1: How the satellite image processing will be selected Unit 3.2: Extracting vector data using ENVI software packages Unit 3.3: Vectors data integration using ArcGIS software package Unit 3.4: Recognizing the patterns of shoreline changes Unit 3.5: Measuring the rates of coastline changes.	4	5,6	Two

		Types of protective work along the beaches. Unit 3.1: Types of protective coastal protection Unit 3.2: Advantages and disadvantages of each engineering work Unit 3.3: Selecting the optimal protective work along the beach Unit 3.4: Assessing the protective works along the Mediterranean coastal zone of Egypt, e.g., Nile Delta coastal zone.	6	7,8,9	Three
		Simulation of shoreline changes using modeling techniques. Unit 5.1: Applications of shoreline changes modelling techniques Unit 5.2: Required data input Unit 5.3: Concepts and limitations of 1D GENESIS (Planform shoreline changes). Unit 5.4: Sensitivity testing Unit 5.5: Beach profiles changes Unit 5.6: DHI Software Models; Basic principles and Limitations	8	10,11,12,13	Four

Practical part content

Topic	No. of Hours	Week(s) No.	practical	Tutorial
Assignment.1: - Manual drawing of beach profile configuration based on field measurements data - Comparison between eroded and accreted beach profiles - Grain size and beach profile configuration	1	1	Excel Spread Sheet	
Assignment.2: Students in this assignment will construct and compare among measured, equilibrium and exponential beach profiles	2	2,3	Excel Spread Sheet	l
Assignment.3: Students in this assignment will analyse remote sensing data (Enhanced Landsat Thematic Mapper images, 30m resolution) of the Nile	2	4,5	1-Display and analyse images using ENVI 4.5& ERDAS Imagine 9.1 software packages 2- Display Raster and	ENVI and ERDAS tutorial

	Delta coastal zone for years 2000, 2005, 2010 and 2015. Vectors data for years 2000, 2005, 2010 and 2015 will be extracted. Detect and monitor the patterns of erosion and accretion along the Mediterranean coastal zone of Egypt in the Nile Delta beach.			Vector layers	
	Assignment.4: Students in this assignment will read a scientific research paper concerning with different types of protective structures and discuss together in its negative and positive impacts on the coastline changes. Students will suggest alternative protective work aiming to mitigate its negative impacts.	1	6	Case studies	

	Assignment.5: Reading the Manual of MIKE21 Models including M21 BW and M21 HD	1	7	Case studies	Manual and visual analyses
	Assignment.6: Students in this assignment will read Manual of 1D GENESIS and 2D &3D DHI software packages. **Assignment.7:** Using GENESIS 1D Planform shoreline changes model	2	8,9	Case studies & Modeling simulation	Manual and visual analyses
	Assignment.8: Using DHI Wave models Using DHI Sediment Transport models	2	10,11	Modeling simulation	Scientific researches
	Assignment.9: Using DHI Hydrodynamic models Using DHI Beach profile models	2	12,13	Modeling simulation	Scientific researches
5- Teaching and learning methods:	- Lectures using data show presentations and handouts - Sessions of oral discussion and critical thinking - Problems solve learning using written a structured academic report and presentat - Some parts of these sessions are based on self learning and feed back - Brain storming by session of oral discussion				

	- Lectures and handouts by the facilitator - Self learning and feedback by students
6- Teaching and learning methods for limited capability students:	- Office hours - Round discussion
7- Students assessment:	
A- Assessment Methods:	Class and lab discussion Written quizzes Mid-term exams Final practical exams Final written exams
B- Assessment schedule	Quiz-1 week-4 Mid-term exams week-7 Quiz-2 week-10 Final practical exam week-14 Final written exams End of semester
C- Assessments Weights	Mid-term exams 10% Oral Exam……..10% Final practical exam 30% Final written exams 60% Total ……..100%
8- List of Books and references	

A- Notes:	Hand outs
B- Obligatory References:	Dean, R.G., 1991. Equilibrium beach profiles: characteristics and applications. Journal of Coastal Research 7, 53–84. Kaiser, M.F.M., 2004. Monitoring and modeling the impact of engineering structures on coastline change, Nile Delta, Egypt. Ph.D. thesis, University of Reading, U.K. Komar, P.D., 1998. Beach Processes and Sedimentation, Second Edition. Prentice-Hall, Inc., New Jersey. 544 pp. Larson, M., 1991. Equilibrium profile of a beach with varying grain size. Proceedings of Coastal Sediments, American Society of Civil Engineers (ASCE) 27, 905–919. Kaiser, M.F. and Frihy, O.E. (2009). Validity of the equilibrium beach Nile Delta, Egypt. Geomorphology, 107, (1-2), Elsevier publication, 25-31.
C- Suggested References:	Komar, P.D., McDougal,W.G., 1994. The analysis of exponential beach profiles. Journal of Coastal Research 10, 59–69. Robert, G.D. and Robert, A.D. 2004. Coastal processes with Engineering applications, Cambridge University Press, 475pp. Kaiser, M.F. 2014. Disturbance of hydrodynamic regime in the Mediterranean coastal zone of Egypt. Journal of Coastal Research, In Press, DOI: http://dx.doi.org/10.2112/JCOASTRES-D-12-00247.1 El Raey, M. (1988). Remote sensing of environment. *Symposium of Environmental (UNARC), Alexandria, Egypt, Alexandria University, 1-19.* El Raey, M., Sharaf El Din, S. H., Khafagy, A.A. and Abo Zed, A. I. (1999). Remote ser

	beach erosion/ accretion along Damietta-Port said shoreline, Egypt. *International* *of Remote Sensing, **20**, 1087-1106.* Jensen, J. R. and Toll, D. L. (1982). Urban change detection mapping using Landsa *The American Cartographer, **2**, 127-147.*
D- Scientific periodicals, websites ….etc	Hansons, H. and N.C. Kraus (1989): GENESIS: Generalized Model for Simulating Change, Report 1: Reference manual and User Guide. *Technical Report CERC, U.S. Army Engineer Waterways Experimental Station, Coastal Engineer Research Center, Vicksburg, Mississippi.* http://www.dhisoftware.com. DHI Software. Eurosion. (2004). Living with coastal erosion in Europe: Sediment and Space for Sustainability. A guide to coastal erosion management practices in Europe: lessons learned. Coastal erosion–Evaluation of the need for action. Directorate General Environment. European Commission. Prepared by the National Institute of Coastal and Marine Management of the Netherlands.

Course coordinator: Head of Department:

Dr. Mona Fouad Kaiser Prof. Mohamed Helmi Gereish

Suez Canal University: **Course code:** GE 318
Faculty of Science: **Course title:** Coastal protection and management

1. Intended learning outcomes of course (ILOs):

A- Knowledge and Understanding:

a1- Recognize the main parts of beach profile
a2- Recognize the factors controlling beach configuration.
a3- Acquire the different types of engineering protection
a4- Recognize the impact on the patterns of coastline changes.

B -Intellectual skills:

b1- Draw cross-shore beach profiles from field measurements and detecting its components.
b2- Differentiate between eroded and accreted beach profiles
b3- Detect the relationship between the pattern of coastline changes and beach profile configuration
b4- Detect coastal changes from satellite image data.

C-Professional and practical skills:

c1- Use the types of soft-wares used to simulate shoreline changes
c2- Assess the impact of engineering structures built at some sites in Egypt.
c3- Evaluate the possible engineering structures used to get positive impact along the beach and neighbouring areas

d-General and transferable skills:

d1- Mitigate coastal problems
d2- Deal with software used for modeling simulation and prediction
d3- Simulate the most appropriate methods for coastal protection

Suez Canal University: **Course code:** GE 318
Faculty of Science: **Course title:** Coastal protection and management

2- Course matrix table

Topic	Week (s) No.	A knowledge and Understanding Skills	Intellectual Skills	Professional and Practical Skills	General skills
Beach profile configuration and its components. Unit 1.1 Coastal zone definitions and subdivisions Unit 1.2: Equilibrium beach profile	1,2	a1,			
Factors controlling changes in beach profiles. Unit 2.1: Identify factors controlling coastal changes Unit 2.2: Field measurements data including, waves, currents, tides, etc. Unit 2.3: Impacts of waves characteristics on the patterns of shoreline changes	3,4	a1			
Shoreline positions, Patterns of shoreline changes, Shoreline field survey and Remote Sensing data. Unit 3.1: How the satellite image processing will be selected Unit 3.2: Extracting vector data using ENVI software packages Unit 3.3: Vectors data integration using ArcGIS	5,6	a1, a2,	b3	c1	d1

software package Unit 3.4: Recognizing the patterns of shoreline changes Unit 3.5: Measuring the rates of coastline changes.					
Types of protective work along the beaches. Unit 3.1: Types of protective coastal protection Unit 3.2: Advantages and disadvantages of each engineering work Unit 3.3: Selecting the optimal protective work along the beach Unit 3.4: Assessing the protective works along the Mediterranean coastal zone of Egypt, e.g., Nile Delta coastal zone.	7,8,9	a1, a2, a3	b3,b4	c1,c2	d1,d2
Simulation of shoreline changes using modeling techniques. Unit 5.1: Applications of shoreline changes modelling techniques Unit 5.2: Required data input Unit 5.3: Concepts and limitations of 1D GENESIS (Planform shoreline changes). Unit 5.4: Sensitivity testing Unit 5.5: Beach profiles changes Unit 5.6: DHI Software Models; Basic principles and Limitations	10,11,12,13	a4	b1, b3	c3	d1,d2,d3

The CLIMASP Course Modules

Course	Horticultural Crops Breeding
Module 1	**Horticultural crops breeding: Introduction, background and future prospective**
Key Concepts	Genetics, Evolution, Natural selection, Food Security, Genetic modification, GMO
Overview	The course is designed to Horticultural department senior year students to provide knowledge of the science and practice of horticultural crops (vegetables, fruits, ornamentals and medicinal plants) breeding. Background issues such as the history of genetics and natural selection are reviewed. How plant breeding is the major contributor to human food security are discussed in this module.
Aim	Introduce student to horticultural crops breeding and identify both historical background of the subject and the future trends in such topic.

Learning Outcomes	<u>At the end of this module students will be able to:</u> - Recognize the relation between breeding and other related biological sciences. - Recognize the role of plant breeding in world food security. - Understand the importance of breed new resistant genotypes to pests and diseases which reduce the application of pesticides and its positive impact on environment.
Units	Unit 1: Introduction and the relation to genetics, evolution and other related biological sciences.
Readings	- Course Notes - Principles of Plant Breeding, A. A. Hassan, 2009. (In Arabic) - Vegetable crops Breeding, A. A. Hassan, 2005. (In Arabic) - Poehlman, J. M. (1994). Breeding field crops. Iowa State University Press.
Activity	**Overview**

	Reading/ internet search Assignment
Module 2	**Methodology and fundamentals**
Key Concepts	Propagation, pollination, selection, hybridization,
Overview	Provide the basic knowledge of the science and practice of horticultural crops breeding that include the reproduction types, selection of parents for hybridization working with hybrid generation and breeding methods of some horticultural crops in order to solve problems associated with the field production. The plant origin, taxonomy and cytology are among the topics of focus in that module.
Aim	Introduce student to horticultural crops breeding methods and principles and identify propagation methods of plants.
Learning Outcomes	<u>At the end of this module students will be able to:</u> - Recognize the reproduction types of plants that maintain

	sustainable use of resources. - Identify the different types of breeding methods. - Work in a breeding program to produce new horticultural plants with new characteristics.
Units	Unit 2: Reproduction and propagation of horticultural plants. Unit 3: Selection and hybridization of horticultural plants
Readings	- Course Notes - Principles of Plant Breeding, A. A. Hassan, 2009. (In Arabic) - Vegetable crops Breeding, A. A. Hassan, 2005. (In Arabic) - Hayward, M. D., Bosemark, N. O., & Romagosa, I. (1993). Plant breeding: principles and prospects. Chapman and Hall Ltd.
Activity	**Overview**
	Reading/ internet search Assignment

	Video viewing
Module 3	**Plant breeding and climate change**
Key Concepts	Climate change, global warming, CO_2 emission, desertification
Overview	Throughout this module, the students will be introduced to concepts and principles of sustainable agriculture and the methods to breed new plant varieties that can fit with such concepts. Environmental issues associated with horticultural crops breeding are discussed during the course. The major threats of climate change to agriculture sector in both general production and horticulture are discussed. Adaption of sustainability concepts and other steps to deal with climate changes is considered during the module. The safety methods of genetic modification to cope with climate change are a key issue of the module.
Aim	1- Introduce student to the importance of breeding practices

	that relate with the sustainable use of genetic resources. 2- Also, discuss how to benefit from those valuable resources to mitigate the effect of climate change. 3- Introduce students to the environmental and ethical dimensions during the various stages of horticultural crops.
Learning Outcomes	<u>At the end of this module students will be able to:</u> - Recognize the current needs for new and efficient horticultural crops varieties that mange the dramatic changes in climate. - Identify how plant breeding is a major contributor to climate change mitigation. - Determine the best breeding methods to alleviate the effect of climate change. - The student understands the importance of breed new resistant genotypes to pests and diseases which reduce the application of pesticides and its positive impact on

	environment.
Units	Unit 4: Plant breeding and climate change
Readings	• Course Notes • Ceccarelli, S., Grando, S., Maatougui, M., Michael, M., Slash, M., Haghparast, R., ... & Nachit, M. (2010). Plant breeding and climate changes. The Journal of Agricultural Science, 148(06), 627-637. • Howden, S. M., Soussana, J. F., Tubiello, F. N., Chhetri, N., Dunlop, M., & Meinke, H. (2007). Adapting agriculture to climate change. Proceedings of the National Academy of Sciences, 104(50), 19691-19696.
Activity	Overview
	Reading/ internet search Assignment
Module 4	**Breeding of vegetable crops**

Key Concepts	Vegetables, varieties, hybrids, production
Overview	Provide knowledge of the science and practice of vegetable crops breeding, in order to solve problems associated with the field production of such vegetables.
Aim	Provide students with scientific knowledge and practical experience on the breeding of vegetable crops.
Learning Outcomes	<u>At the end of this module students will be able to:</u> - Study the different types of breeding methods applied to vegetable crops. - Recognize the current needs for new and efficient vegetable crops varieties that mange the dramatic changes in climate. - Introduces students to new trend in producing vegetable crops high in antioxidant content for better human life.
Units	Unit 5: Cucurbit crops breeding Unit 6: Solanaceous crops breeding Unit 7: Cole crops breeding

Readings	• Course Notes • Vegetable crops Breeding, A. A. Hassan, 2005. (In Arabic) • Tomato, A. A. Hassan, 2001. (In Arabic) • Fruit Vegetables, A. A. Hassan, 2001. (In Arabic)
Activity	**Overview**
	Reading/ internet search Assignment Field and greenhouse trip
Module 5	**Breeding of fruit crops**
Key Concepts	Fruits, varieties, tree breeding, evergreen fruit trees, deciduous fruit trees
Overview	Provide knowledge of the science and practice of fruit crops breeding, in order to solve problems associated with the field production of such fruits.
Aim	Provide students with scientific knowledge and practical experience

	on the breeding of fruit crops.
Learning Outcomes	<u>At the end of this module students will be able to:</u> - Study the different types of breeding methods applied to fruit crops. - Recognize the current needs for new and efficient fruit crops varieties that mange the dramatic changes in climate. - Introduce students to new trend in producing fruit crops high in antioxidant content for better human life.
Units	Unit 8: Citrus crops breeding Unit 9: Stone fruits breeding Unit 10: Grape and apple breeding Unit 11: Date palm and mango breeding
Readings	- Course Notes - Janick, J., & Moore, J. N. (1975). Advances in fruit breeding. Purdue University Press.. - Moore, J. N., & Janick, J. (1983). Methods in fruit breeding.

	Purdue University Press.
Activity	**Overview**
	Reading/ internet search Assignment Orchard trip
Module 6	**Breeding of ornamental and medicinal crops**
Key Concepts	Flowers, bulbs, trees, shrubs,
Overview	Provide knowledge of the science and practice of ornamental crops (flowers, bulbs, trees, shrubs) breeding, in order to solve problems associated with the field production of such plants.
Aim	Provide students with scientific knowledge and practical experience on the breeding of ornamental, aromatic and medicinal crops.
Learning Outcomes	<u>At the end of this module students will be able to:</u> - Study the different types of breeding methods applied to

	ornamental, aromatic and medicinal crops. - Introduce students to new trend in medicinal plants usage in alternative medicine.
Units	Unit 12: Ornamental plants breeding
Readings	- Course Notes - Vainstein, A. (Ed.). (2002). *Breeding for ornamentals: classical and molecular approaches*. Springer. - De Jeu, M. J. (1998, July). In vitro techniques for ornamental breeding. In *XIX International Symposium on Improvement of Ornamental Plants 508* (pp. 55-60). - Shibata, M. (2008). Importance of genetic transformation in ornamental plant breeding. *Plant biotechnology*, *25*(1), 3-8.
Activity	**Overview**
	Reading/ internet search Assignment

	Park trip
Module 7	Biotechnology
Key Concepts	Biotechnology, Tissue Culture, Genetic Engineering, GMO
Overview	Provide knowledge of the science and practice of crops breeding using recent and modern techniques of biotechnology.
Aim	Introduce student to recent and modern techniques of biotechnology.
Learning Outcomes	At the end of this module students will be able to: - Recognize the current needs for biotechnology applications in field of breeding. - Recognize the role of biotechnology to cope with the dramatic changes in climate. - Introduce students to the safe use of biotennology.
Units	Unit 14: Tissue culture application in ornamental plants Unit 15: Genetic engineering in ornamental plants

Readings	- Course Notes - Bliss, F. A. (1992, June). Biotechnology and plant Breeding. In *II International Symposium on In Vitro Culture and Horticultural Breeding 336* (pp. 23-32). - Morandini, P., & Salamini, F. (2003). Plant biotechnology and breeding: allied for years to come. *Trends in plant science*, *8*(2), 70-75. - George, E. F., & Sherrington, P. D. (1984). *Plant propagation by tissue culture*. Exegetics Ltd..
Activity	**Overview**
	Reading/ internet search Assignment Video viewing

Course Syllabus

Course Name: Horticultural Crops Breeding

Suez Canal University, Faculty of Agriculture, Department of Horticulture
Fall Semester, 2014

Instructor Information
Instructor: **Khalid El-Sayed Abd El-Hamed, Lecturer.**
Office Location: ***Department of Horticulture Building.***
Telephone: **Office – 3217531**
Office Hours: **Sunday, Wednesday 10-12 AM.**
E-mail: **khalidegy1@yahoo.com**
Website: **www. http://scuegypt.edu.eg/**

Course Identification
Course Name: Horticultural Crops Breeding
Course Location: Department of Horticulture Building
Class Times: Lecturer, Thursday 9 AM-11 PM
Practical Session: Thursday 11-3 PM
Prerequisites: 1- Fundamentals of Horticultural Science
2- Plant Breeding
Faculty Web Page: http://scuegypt.edu.eg/

Course Description/Overview

The course is designed to Horticultural department senior year students to provide knowledge of the science and practice of horticultural crops (vegetables, fruits, ornamentals and medicinal plants) breeding, that include the reproduction types, selection of parents for hybridization working with hybrid generation and breeding methods of some horticultural crops in order to solve problems associated with the field production.

The plant origin, taxonomy and cytology are among the topics of focus in that course. Throughout the course, the students will be introduced to concepts and principles of sustainable agriculture and the methods to breed new plant varieties that can fit with such concepts. Environmental issues associated with horticultural crops breeding are discussed during the course.

The major threats of climate change to agriculture sector in both general production and horticulture are discussed. Adaption of sustainability concepts and other steps to deal with climate changes is considered during the syllabus. The safety methods of genetic modification to cope with climate change are a key part of the course.

Course Learning Objectives

1 - Provide students with scientific knowledge and practical experience on the breeding of horticultural crops (fruits, vegetables, ornamental plants).

2 - Introduce students to the interrelationship between different methods of horticultural crops breeding (mass selection, backcross, and recurrent selection).

3- Introduce student to the different breeding practices that relate with the sustainable use of genetic resources. Also, discuss how to benefit from those valuable resources to mitigate the effect of climate change.

4 - Introduce students to the environmental and ethical dimensions during the various stages of horticultural crops breeding to produce healthy and high quality product.

Course Content Learning Outcomes

1- Knowledge and concepts:

- Recognize the reproduction types of plants that maintain sustainable use of resources
- Study the different types of breeding methods.
- Recognize the current needs for new and efficient horticultural crops varieties that mange the dramatic changes in climate.
- Introduces students to new trend in producing vegetable and fruit crops high in antioxidant content.
- Introduce different agricultural methods that adopt the sustainable use of resources.
- Identify how plant breeding is a major contributor to climate change mitigation.

2- Intellectual and mental skills

- The student determines the best breeding methods to alleviate the effect of climate change.
- The student understands the importance of breed new resistant genotypes to pests and diseases which reduce the application of pesticides and its positive impact on environment.
- Analyze the needs of both domestic and international markets.

3-Professional and practical skills:

- Student will be able to breed different kinds of horticultural crops.
- Apply the appropriate methods of plant breeding to the third world limited resources.
- Student should be able to work in a breeding program to produce new horticultural plants with new characteristics.
- Discover problems associated with the breeding process and use of theoretical knowledge and information from lectures to solve those problems.

4- General and transferable skills:

- Each student explains the proper methods of breeding specific horticultural crop to his colleagues.
- The student presents the expected environmental impact of breeding new pests and diseases resistant genotypes

- Students work in groups to solve the problems associated with breeding complicated process.
- Students display the problems encountered during the breeding of crops and their vision to solve.

Course Resources

Required Course Texts and Materials

- **Course Notes (Class note will be prepared and distributed at the beginning of lectures.**
- **Vegetable crops Breeding, A. A. Hassan, 2005. (In Arabic)**
- **Ceccarelli, S., Grando, S., Maatougui, M., Michael, M., Slash, M., Haghparast, R., ... & Nachit, M. (2010). Plant breeding and climate changes. The Journal of Agricultural Science, 148(06), 627-637.**
- **Howden, S. M., Soussana, J. F., Tubiello, F. N., Chhetri, N., Dunlop, M., & Meinke, H. (2007). Adapting agriculture to climate change. Proceedings of the National Academy of Sciences, 104(50), 19691-19696.**

Optional Course Texts and Materials

- **Horticultural Science, Jules Janick, 1986.**
- **Periodicals (Journal of the American Society for Horticultural Science, HortScience, HortTechnology)**

Assignments and Grading Scheme

(Insert the course assignments here, and indicate how each assignment is aligning with the learning outcomes).

Grading System

Insert your grading system

Grading Policy

Attendance and Reports	**5%**
Mid-Term Exam	**5%**
Practical Exam	**20%**
Oral Exam	**10%**
Final Exam	**60%**
Total Points	**100**

Course Schedule
Lecturers, Thursday 9 AM-11 PM

Week	Date	Topics, Reading, Assignments and Deadlines
1	**16/10/2014**	**Introduction to breeding science and the relation to other biological sciences.**
2	**23/10/2014**	**Reproduction and propagation of horticultural plants.**
3	**30/10/2014**	**Selection and hybridization of horticultural plants**
4	**6/11/2014**	**Plant breeding and climate change**
5	**13/11/2014**	**Cucurbit crops breeding**
6	**20/11/2014**	**Solanaceous crops breeding**
7	**27/11/2014**	**Cole crops breeding**
8	**4/12/2014**	**Citrus crops breeding**

9	**11/12/2014**	**Stone fruits breeding**
10	**18/12/2014**	**Grape and apple breeding**
11	**25/12/2014**	**Date palm and mango breeding**
12	**1/1/2015**	**Ornamental plants breeding**
13	**8/1/2015**	**Tissue culture application in ornamental plants**
14	**15/1/2015**	**Genetic engineering in ornamental plants**
15	**22/1/2015**	**Oral and Final Examination**

Practical Sessions: Thursday 11-3 PM

Week	Date	Topics, Reading, Assignments and Deadlines
1	**16/10/2014**	**Introduction to breeding science**
2	**23/10/2014**	**Reproduction and propagation of horticultural plants (Nursery Trip)**
3	**30/10/2014**	**Selection and hybridization of horticultural plants (Greenhouse Trip)**
4	**6/11/2014**	**Plant breeding and climate change**
5	**13/11/2014**	**Cucurbit crops breeding (Greenhouse Trip)**
6	**20/11/2014**	**Solanaceous crops breeding**

7	**27/11/2014**	**Cole crops breeding (Greenhouse Trip)**
8	**4/12/2014**	**Citrus crops breeding**
9	**11/12/2014**	**Stone fruits breeding (Orchard Trip)**
10	**18/12/2014**	**Grape and apple breeding (Orchard Trip)**
11	**25/12/2014**	**Date palm and mango breeding**
12	**1/1/2015**	**Ornamental plants breeding**
13	**8/1/2015**	**Tissue culture applications (Tissue culture laboratory)**
14	**15/1/2015**	**Genetic engineering in ornamental plants**
15	**22/1/2015**	**Practical Examination**

The CLIMASP Course Modules

Course	**Horticultural Crops Production**
Module 1	**Introduction to Horticulture Science, methodology and sustainability in agriculture.**
Key Concepts	Horticultural science, production, sustainability

Overview	The course is designed to plant protection department senior year students to be able to manage horticultural crops production. The focus of this module is introducing the different steps of production such as propagation, irrigation, fertilization, concepts and principles of sustainable agriculture.
Aim	Provide students with scientific knowledge and practical experience on the cultivation and production of horticultural crops (fruits, vegetables, ornamental plants).
Learning Outcomes	<u>At the end of this module students will be able to:</u> - Recognize the morphological characteristics of horticultural crops and their growth requirements. - Study the optimum methods of cultivation and production of horticultural crops. - Recognize the problems associated with the production of horticultural crops and how to deal with these problems. - Apply the correct principles of fertilization and irrigation programs to achieve economically and environmentally-friendly production.
Units	Unit 1: Introduction to Horticulture Science and basic concepts associated with production such as propagation, fertilization, irrigation sustainability in agriculture.
Readings	- Course Notes - Horticultural Science, Jules Janick, 1986. - Plant Propagation (Principles and Practices), Hartman et al., 1997.

Activity	**Overview**
	Reading/ internet search Assignment Video viewing
Module 2	**Fruit crops**
Key Concepts	Fruits, varieties, evergreen fruit trees, deciduous fruit trees
Overview	Provide knowledge of the science and practice of fruit crops production, in order to solve problems associated with the field production of such fruits.
Aim	Provide students with scientific knowledge and practical experience on the production of fruit crops.
Learning Outcomes	<u>At the end of this module students will be able to:</u> - Identify the different types of production methods applied to fruit crops. - Recognize the current needs for new and efficient fruit crops varieties that mange the dramatic changes in climate. - Introduces students to new trend in producing fruit crops high in antioxidant content for better human life.
Units	Unit 2: Stone Fruits (peach - plum - apricot - almond) production Unit 3: Pome Fruits (apples and pears) production Unit 4: Grapes production Unit 5: Citrus (orange, tangerine, lemon, grape fruit) production Unit 6: Tropical Fruits (banana, mango, date palm) production
Readings	- Course Notes

	- Faust, M. (1989). Physiology of temperate zone fruit trees. John Wiley & Sons, Inc.. - Kader, A. A. (Ed.). (2002). Postharvest technology of horticultural crops (Vol. 3311). UCANR Publications.
Activity	**Overview**
	Reading/ internet search Assignment Video viewing
Module 3	**Vegetable crops**
Key Concepts	Vegetables, varieties, production
Overview	Provide knowledge of the science and practice of vegetable crops production, in order to solve problems associated with the field production of such vegetables.
Aim	Provide students with scientific knowledge and practical experience on the production of vegetable crops.
Learning Outcomes	At the end of this module students will be able to: - Identify the different types of production methods applied to vegetable crops. - Recognize the current needs for new and efficient vegetable crops varieties that mange the dramatic changes in climate. - Introduces students to new trend in producing vegetable crops high in antioxidant content for better human life.
Units	Unit 7 : Production of tomatoes Unit 8: Production of cucurbits (watermelon, cucumber, melon,

	squash) Unit 9: Production of pulse crops (pea, beans) Unit 10: Production Cole crops (cabbage, cauliflower, broccoli)
Readings	• Course Notes • Vegetable crops, A. A. Hassan, 2001. (In Arabic) • Tomato, A. A. Hassan, 2001. (In Arabic) • Fruit Vegetables, A. A. Hassan, 2001. (In Arabic)
Activity	**Overview**
	Reading/ internet search Assignment Video viewing
Module 4	**Ornamental crops and their economic and environmental benefits**
Key Concepts	Flowers, bulbs, trees, shrubs
Overview	Provide knowledge of the science and practice of ornamental crops (flowers, bulbs, trees, shrubs) production, in order to solve problems associated with the field production of such plants.
Aim	Provide students with scientific knowledge and practical experience on the production of ornamental plants.
Learning Outcomes	<u>At the end of this module students will be able to:</u> - Recognize the different types of production methods applied to ornamental plants.
Units	Unit 11: Introduction to ornamental plants and their different

	uses. Unit 12:Woody ornamental, shrubs and trees production and their economic and environmental benefits
Readings	- Course Notes - Handreck, K. A., & Black, N. D. (2002). *Growing media for ornamental plants and turf*. UNSW press. - Still, S. M. (1994). *Manual of herbaceous ornamental plants*. Champaign, IL: Stipes Publishing Company. - Hernández-Apaolaza, L., Gascó, A. M., Gascó, J. M., & Guerrero, F. (2005). Reuse of waste materials as growing media for ornamental plants. *Bioresource Technology*, *96*(1), 125-131.
Activity	**Overview**
	Reading/ internet search Assignment Video viewing
Module 5	**Landscape**
Key Concepts	Lawn, gardens, parks, sports fields
Overview	Provide knowledge of the science and practice of landscaping (lawn, gardens, parks, sports fields) management.
Aim	Provide students with scientific knowledge and practical experience on the management of landscaping.

Learning Outcomes	<u>At the end of this module students will be able to:</u> - Identify the different types of landscaping plants and management.
Units	Unit 13: Landscape
Readings	- Course Notes - Carpenter, P. L., Walker, T. D., & Lanphear, F. O. (1975). Plants in the landscape. WH Freeman & Co.. - Krupka, B. (1992). Roof gardening: use of plants and vegetation on buildings. Eugen Ulmer. - Liu, H., & Xia, Y. P. (2003). Aquatic Plants in Landscape Design. Journal of Chinese Landscape Architecture, 3, 59-62.
Activity	**Overview**
	Reading/ internet search Assignment Video viewing
Module 6	**Medicinal and aromatic plants and their benefits and applications in alternative medicine**
Key Concepts	Medicinal and aromatic plants, active ingredients
Overview	Provide knowledge of the science and practice of medicinal and aromatic plants production, in order to solve problems associated with the field production of such plants.

Aim	Provide students with scientific knowledge and practical experience on the production of aromatic and medicinal crops.
Learning Outcomes	<u>At the end of this module students will be able to:</u> - Identify the different types of medicinal and aromatic plants. - Introduce students to new trend in medicinal plants usage in alternative medicine.
Units	Unit 14: Medicinal and aromatic plants and their benefits and applications in alternative medicine
Readings	- Course Notes - Boulos, L. (1983). Medicinal Plants of North Africa. *Medicinal plants of North Africa.* - Batanouny, K. H., Abou Tabl, S., Shabana, M., & Soliman, F. (1999). Wild medicinal plants in Egypt. *With contribution of: E. Aboutabl, M. Shabana & F. Soliman). With support of the Swiss Development Co-operation (SDC). Academy of Scientific Research and Technology, Egypt. The World Conservation Union (IUCN), Switzerland*, 60-64.
Activity	**Overview**
	Reading/ internet search Assignment Video viewing
Module 7	**Horticultural production and climate change**
Key Concepts	Climate change, global warming, CO_2 emission, desertification
Overview	Throughout the module, the students will be introduced to

	concepts and principles of sustainable agriculture. Environmental issues associated with horticultural crops production are discussed during the module. The major threats of climate change to agriculture sector in both general production and horticulture are discussed. Adaption of sustainability concepts and other steps to deal with climate changes is considered during the module. The safety methods of mitigation practices to cope with climate change are a key issue of this module.
Aim	4- Introduce student to the importance of production practices that relate with the sustainability. 5- Discuss how to benefit from valuable local resources to mitigate the effect of climate change. 6- Introduce students to the environmental and ethical dimensions during the various stages of horticultural crops.
Learning Outcomes	<u>At the end of this module students will be able to:</u> - Recognize the current needs for new and efficient horticultural crops varieties that mange the dramatic changes in climate. - Determine the best production methods to alleviate the effect of climate change. - The student understands the importance of adapt sustainable concepts of production.
Units	Unit 15: Horticultural production and climate change

Readings	- Course Notes - Howden, S. M., Soussana, J. F., Tubiello, F. N., Chhetri, N., Dunlop, M., & Meinke, H. (2007). Adapting agriculture to climate change. Proceedings of the National Academy of Sciences, 104(50), 19691-19696. - Coakley, S. M., Scherm, H., & Chakraborty, S. (1999). Climate change and plant disease management. *Annual review of phytopathology*, *37*(1), 399-426. - Ortiz, R., Sayre, K. D., Govaerts, B., Gupta, R., Subbarao, G. V., Ban, T., ... & Reynolds, M. (2008). Climate change: Can wheat beat the heat?. *Agriculture, Ecosystems & Environment*, *126*(1), 46-58.
Activity	**Overview**
	Reading/ internet search Assignment Video viewing

Course Syllabus

Course Number: Production of Horticultural Crops
Suez Canal University, Faculty of Agriculture, Department of Horticulture
Spring Semester, 2015

Instructor Information

Instructor: **Khalid El-Sayed Abd El-Hamed, Lecturer.**
Office Location: **Department of Horticulture Building.**
Telephone: **Office – 3217531**
Office Hours: **Monday, Wednesday 10-12 AM.**
E-mail: **khalidegy1@yahoo.com**
Website:

Course Identification

Course Number: B.B 304
Course Name: Production of Horticultural Crops
Course Location: Department of Horticulture Building
Class Times: Lecturer, Sunday 11 AM-1 PM
Practical Session: Sunday 1-5 PM
Prerequisites: Fundamentals of Horticultural Science
Faculty Web Page: http://scuegypt.edu.eg/

Course Description/Overview

The course is designed to plant protection department senior year students to be able to manage horticultural crops production. The focus of this course is on the different steps of production such as propagation, irrigation, fertilization etc. Throughout the course, the students will be introduced to concepts and principles of sustainable agriculture and the methods to apply such concepts in farmer fields which include Integrated Pest Management and Organic Farming.
The major threats of climate change to the agricultural production with focus on the effect on horticultural plants are discussed. Environmental issues associated with horticultural crops production are discussed during the course.

Course Learning Objectives

1 - Provide students with scientific knowledge and practical experience on the cultivation and production of horticultural crops (fruits, vegetables, ornamental plants).
2 - Introduce students to the interrelationship between different horticultural crops production factors (soil, environment, irrigation,

fertilization).

3- Introduce students to the different agricultural practices that correspond with the sustainable production of various crops which reduce the harmful effect of climate change on plants.

4 - Introduce students to the environmental and ethical dimensions during the various stages of horticultural crops production to maintain healthy and high quality product.

Course Content Learning Outcomes

<u>1- Knowledge and concepts:</u>

- Recognize the morphological characteristics of horticultural crops and their growth requirements. - Study the optimum methods of cultivation and production of horticultural crops. - Recognize the problems associated with the production of horticultural crops and how to deal with these problems.

- Introduces students to the domestic market needs of fruits and vegetables.

- Recognize the knowledge related to climate change effects and mitigation practices.

- Introduce different agricultural practices that adopt the sustainable production.

<u>2- Intellectual and mental skills</u>

- The student determines the optimum methods of production and differentiates between the needs of each crop separately. - The student understands the importance of using resistant genotypes to pests and diseases in reducing the application of insecticides and the positive impact on environment.

- Analyze the needs of both the local and export market of horticultural crops and how to manage those needs in the production process. <u>3- Professional and practical skills:</u>

- Student will be able to establish horticultural crops farm using modern but sustainable approaches.

- Apply the correct principles of fertilization and irrigation programs to achieve economically and environmentally-friendly production.

- Apply the different sustainable practices that reduce the climate change effects.

- Student should be able to produce horticultural fruits of free of pesticides and harmful synthetic chemicals.

- Discover problems associated with production and use of theoretical knowledge and information from lectures to solve those problems. <u>4- General and transferable skills:</u>

- Each student explains the proper methods of specific horticultural crop production to his colleagues - The student presents the environmental expected impact of using pesticides in production of horticultural crops

- Students work in groups to solve the problems associated with production. - Students display the problems encountered during the

production of vegetable crops and their vision to solve.

Course Resources

Course Website(s)

94. United States Department of Agriculture, The National Agricultural Library: http://www.nal.usda.gov/plants-and-crops

Required Course Texts and Materials

- **Course Notes (Class note will be prepared and distributed at the beginning of lectures.**
- **Production of Temperate and Warm Zone Vegetables, A. A. Hassan, 1999. (In Arabic)**

Optional Course Texts and Materials

- **Periodicals (Journal of the American Society for Horticultural Science, HortScience, HortTechnology)**
- **Sustainability in agriculture websites (National Sustainable Agriculture Information Service: https://attra.ncat.org/publication.html,) http://www.cias.wisc.edu/curriculum/index.htm**
- **Horticultural Science, Jules Janick, 1986.**
- **Plant Propagation (Principles and Practices), Hartman et al., 1997.**
- **Organic Farming, N. Lampkin, 1999, farming Press, USA.**
- **World Vegetables, V.E. Rubatzky and M. Yamaguch, 1999, Aspen Publisher Inc. USA.**

Assignments and Grading Scheme

(Insert the course assignments here, and indicate how each assignment is aligning with the learning outcomes).

Grading System

Insert your grading system

Grading Policy

Attendance and Reports	
Mid-Term Exam	
Practical Exam	

Oral Exam	
Final Exam	
Total Points	

Course Policies

Late Assignments

(Describe your late assignment policy here).

Classroom Protocol

(Insert your expectations for participation, attendance, arrival times, behavior etc. here)

Important Dates to Remember

(Insert key dates that students must remember)

Course Schedule

Lecturers, Sunday 11 AM-1 PM

Week	Date	Topics, Reading, Assignments and Deadlines
1	**15/2/2015**	**Introduction to Horticulture Science and basic concepts associated wi production such as propagation, fertilization, irrigation sustainability agriculture.**
2	**22/2/2015**	**Stone Fruits (peach - plum - apricot - almond) production**
3	**1/3/2015**	**Pome Fruits (apples and pears) production**
4	**8/3/2015**	**Grapes production**
5	**15/3/2015**	**Citrus (orange, tangerine, lemon, grape fruit) production**
6	**22/3/2015**	**Tropical Fruits (banana, mango, date palm) production**
7	**29/3/20**	**Production of tomatoes**
8	**5/4/2015**	**Production of cucurbits (watermelon, cucumber, melon, squash) Mid-Term Examination**
9	**12/4/2015**	**Production of pulse crops (pea, beans)**
10	**19/4/2015**	**production Cole crops (cabbage, cauliflower, broccoli)**

11	**26/4/2015**	• **- Introduction to ornamental, medicinal and aromatic pl and their different uses** • **- Woody ornamental, shrubs and trees production and t economic and environmental benefits**
12	**3/5/2015**	**Flowers and landscape**
13	**10/5/2015**	**Medicinal and aromatic plants and their benefits and applications in alternative medicine**
14	**17/5/2015**	**Horticultural production and climate change**
15	**24/5/2015**	**Oral and Final Examination**

Practical Sessions: Sunday 1-5 PM

Week	Date	Topics, Reading, Assignments and Deadlines
1	**15/2/2015**	**Training students to establish an orchard.(experimental farm trip)**
2	**22/2/2015**	**Morphological characteristics of the stone fruit plants and training or to prune those trees.**
3	**1/3/2015**	**Morphological characteristics of the pome fruit plants and training or to prune those trees.**
4	**8/3/2015**	**Morphological characteristics of grape plant and train students to propagate grape using cuttings.**
5	**15/3/2015**	**Morphological characteristics of citrus plants and train students to distinguish between different types of citrus vegetative growth and flowers.**
6	**22/3/2015**	**Morphological characteristics of date palm, mango, banana plants./ orchard trip**
7	**29/3/20**	**Morphological characteristics of tomato plants and training on transplanting./ nursery trip**
8	**5/4/2015**	**Morphological characteristics of watermelon, squash, melon and cucumber plants and training on greenhouse production. /greenhouse facility trip**

9	12/4/2015	orphological characteristics of pea, bean and cowpea plants./field trip
10	19/4/2015	orphological characteristics of cabbage, broccoli and cauliflower./field trip
11	26/4/2015	• - Identification of different ornamental plants (indoor an outdoor) /nursery trip • - Identification of woody ornamental, shrubs and trees. /p trip
12	3/5/2015	Design and establish of a garden
13	10/5/2015	Identification of various medicinal and aromatic plants /nursery trip
14	17/5/2015	Horticultural plants and climate change
15	24/5/2015	Practical Examination

LIST OF INSTRUCTORS AND THE COURSES TO BE REVISED			
Name of the instructor	**Faculty/Department**	**Course(s) to be revised for CLIMASP**	**E-mail**

Marwa samir kamel ali mohamed	Faculty of Agriculture – Suez Canal University	Agriculture zoology	Marwa.samir@yahoo.com

This course content on many points, likes biodiversity , taxonomy for animal pests , relation between Agriculture pests and climate change , finally how management animal pests by use integrated pest management .
Effect of climate change is more in temperate pests, it permits range expansion. Among the various a biotic factors, temperature is an important force to drive the population. Temperatures cause the direct effects like survival, growth and development, and dispersal. There may be the possibility of evolutionary adaption in pests for change population dynamics of pests differently in different agro-ecosystem and ecological zones

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Personal Details

Full Name:	*Marwa SamirKamilAli*
Nationality:	*Egyptian*
Date of Birth:	*25 November, 1977*
Place of Birth:	*El-Agoza , Egypt*
Martial Status:	*Marid*
Affiliation::	*Lecturer*

Personal Details (work address)

Institution:	Department of Plant Protection, Faculty of Agriculture, Suez Canal University
Country	Egypt
City	Ismailia
Postal Code	41522
Tel(Home):	002 064 3 343434
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Fax (work):	
Hompage:	http://scuegypt.academia.edu/Marwakamel

E-mail: marwa.samir@yahoo.com

Languages

English: very good

Employment History

	From	To	Name of Organization
Resaerch assistant	1999	2001	Agriculture Research Center
Demonstrator	2001	2007	Suez Canal University
Assistant lecturer	2007	2013	Suez Canal University
Lecturer	2013	-	Suez Canal University

Academic Qualifications

Institute / University	Country	Year	Degree
Faculty of Agriculture, Ain Shams University	**Egypt**	**1999**	**B.Sc**
Faculty of Agriculture, Suez Canal University	**Egypt**	**2007**	**M.Sc**
Faculty of Agriculture, Suez Canal University	**Egypt**	**2013**	**Ph.D**

Teaching Experiences

- **Under graduate**
  - Agriculture zoology
  - Harmful mites

Local & International Projects

Local Projects:

- 2007: Research Associate: Environmental Impact Assessment, Faculty of Agriculture, Suez Canal University

International Projects:

- Innovative Processes and Practices for Wastewater Treatment and Re Use in theMediterranean Region, A European Commission Funded Project, Within the FP6 Programme.2006-2009.

- Climate change, water conflicts and human security in the Mediterranean, the Middle East and Sahel. A European Commission Funded Project, Within the FP7 Programme. 2010-2013.

Training Attended

2006	Program of effective teaching and teaching mini - e-learning Centre at Suez Canal University, 19-22 November 2006
2006	The use of technology in teaching and Methods of Scientific Research -e-learning Centre at Suez Canal University.
2010	ICDL "license"
2011	Time management program and meetings --e-learning Centre at Suez Canal University.
2013	International Scientific Publishing Program and Program quality standards in the teaching process- e-learning Centre at Suez Canal University.
2013	Program project research and global competitiveness Ornament - e-learning Centre at Suez Canal University.

List of publications

Awad A.F. El Bahrawy; Laila A.Reda;Ludovit Cagan;Maha A.Shoaib and **Marwa S.Kamel** ,The Kestrel (*Falco tinnunculus rupicolaeformes)* As A Natural Enemy Of Some Agricultural Pests In Ismailia Governorate.Acta fytotechnica et zootechinica 2007

M.F.Hassan; A.F.El-Bahrawy; G.A.El-Kady;Reham I.A.Abo-shnafe and **Marwa S.Kamel ,**Phytophagous mites and their natural enemies associated with common vegetables at Ismailia Governorate. Acarines,7:71-74,2013

M.F.Hassan; G.A.El-Kady;A.F.El-Bahrawy; Reham I.A.Abo-shnafe and **,Marwa S.Kamel**, Effectof temperature and host plant on the biological aspects of *Tetranychus cucurbitacearum*(sayed)(Acari:Tetranychidae). Acarines,7(2):67-70,2013

جامعة قناة السويس – كلية الآداب
والعلوم الإنسانيه
قسم التاريخ والحضاره
العام الدراسى 2014-2015م.

بيانات المحاضر
المحاضر:- د. إيمان أحمد نور الدين أبوبكر
مكان العمل:- كلية الاداب –جامعة قناة السويس
بيانات المقرر
كود المقرر:-
اسم المقرر:- حضارة وتاريخ الرومان
المكان: كلية الآداب والعلوم الانسانيه – جامعة قناة السويس

نظرة عامة/وصف المقرر

تتميز ايطاليا بالتنوع فى المناخ والتربة، وهذا التنوع الاقليمى يميز دائما حياة ايطاليا، وأدى الى تنوع حضارى واقتصادى ، كما أدى وجود الوديان المتباعده والاخاديد العميقة والهضاب العاليه الى ظهور مجتمعات رعوية منعزلة الواحده عن الاخرى، كما كانت ايضا شعوب ايطاليا من اصل اجناس مختلفة يتكلمون لغات مختلفه واستمر الوضع كذلك الى ان استطاعت روما ضم الاقاليم المختلفة بشبه الجزيرة الايطالية.

ونظرا لتنوع المناخ والتربة من منطقة لاخرى وجدت مناطق مزدهره ب**الزراعه** ومتنوعة المحاصيل ومناطق اخرى منحصره فى **الرعى** فقط .

ولعبت **الجبال** دورا هاما فى ايطاليا حيث توجد سلسله جبال الالب فى الشمال والتى تهتبر حاجز طبيعى منيع اما اى مغير من الشمال ، كما لعبت جبال ابنين دورا فى البداية فى تقسيم ايطاليا الى جزء شرقى وجزء غربى منفصلين الى ان استطاع الرومان بعمل ممرات فى الجبل ادت الى ربط الجزئين واقامة الدوله الواحده.

كما تاثرت الحضاره فى ايطاليا ايضا **بالبحر** الذى كان له اثر فى البداية فى تاخر دخول ايطاليا مجال النقل البحرى وذلك لقلة تعاريج السواحل رغم امتدادها الى جانب الرياح غير الملائمه للملاحه ثم استطاعت بعد ذلك دخول الملاحه البحريه .

الهدف الاساسى من هذا المقرر :-

1- تعريف الطالب بتاريخ وحضارة شبه الجزيره الايطاليه والرومان.

2- معرفة الدور الكبير الذى لعبته كل من للبيئه والمناخ فى قيام الحضارة فى ايطاليا.

3. جمع المعلومات التاريخية والحضارية والمتعلقة بتاريخ وحضارة والرومان من مصادرها القديمة والحديثة.

4- ضروره حرص الانسان فى وقتنا الحاضر على المحافظه على البئيه واهتمامه **بها**.

5 - فهم تطور تاريخ الرومان فى مراحله المختلفة ونتائج تلك التطورات فى مختلف المجالات.

عند نهاية االمقرر يكون الطالب قادرا على :-

أ- المعرفة و الفهم

knowledge and Understanding

ان يكون الخريج قادرا على فهم:-

أ-1 معني ومفهوم تاريخ وحضارة الرومان والغرض من دراسته.

أ-2 مراحل تطور تاريخ حضارة الرومان.

أ-3 اسباب قيام وانهيار الحضارة الرومانيه والنتائج المترتبه على ذلك.

ب- المهارات الذهنية

Intellectual skills

ان يكون الخريج قادرا على:-

ب-1 تشخيص القضايا التاريخية والحضارية التى مرت بايطاليا والدروس المستفادة منها.

ب-2 تحليل اسباب الصراعات التاريخية والحضارية

جـ- المهارات المهنية

Professional Skills

ج-1 جمع وتحليل المعلومات والبيانات التاريخية والحضارية الخاصة بتاريخ الرومان واعداد تقارير عنها وذلك بالاستعانه بتكنولوجيا المعلومات.

ج-2 القدرة على تحليل ونقد مصادر تاريخ وحضارة الرومانيه.

ج-3 القدرة على استخدام الخرائط التى تخدم المقرر الدراسى.

د- المهارات العامة

General Skills

د-1 استخدام إمكانيات الحاسوب والوسائط التكنولوجية الحديثة في التواصل والإطلاع والبحث تاريخ وحضارة الرومان.

د- 2 الالمام بلغة اجنبية واحده على الاقل للاستفاده منها فى الاطلاع على الوثائق والمراجع التى كتبت عن تاريخ وحضاره الرومان.

د-3 القدرة على جمع الماده العلمية الخاصة بتاريخ وحضارة الرومان من مصادرها المتنوعة.

المراجع التى يمكن الاستفاده منها :-

- حسين الشيخ: الرومان، دار المعرفة الجامعية، الاسكندرية،2005
- ابراهيم نصحى: تاريخ الرومان، جزءان، القاهره، 1978
- مصطفى العبادى- الامبراطورية الرومانيه-الاسكندرية- 1999.
- دونلدر دلى- حضارة روما- مترجم- القاهره

تقسيم الدرجات

اعمال السنه : لايوجد

الامتحان :- 100 درجه

الاجمالى :- 100 درجه

نظام عرض المقرر:-

يتضمن العام الدراسى 28 اسبوع كل اسبوع ساعتين(الماده ممتده عام دراسى كامل) ، وسوف يتم دراسة الموضوعات من خلال اعطاء تمهيد عن الموضوع ثم يقوم مجموعه من الطلاب بعرض ماقاموا به من ابحاث عن الموضوع المقرر مناقشته فى الاسبوع كما يقومون بعرض مايخص الموضوع من لوحات او افلام تسجيليه، وفى النهاية تتم مناقشه ماقام الطلاب بعرضه ومعرفة كيفية الاستفاده من البيئة المحيطة بنا والحفاظ عليها.

محتويات المقرر

الاسبوع	الموضوع
1،2	عرض الموضوعات التى سيتم تدريسها فى الفصل الدراسى، تعريف بتاريخ وحضاره بلاد الرومان
3،4	التعريف بمقومات قيام الحضارة الرومانية، ومصادر تاريخ روما
5،6	نشأة روما والظروف الجغرافية واثارها فى تاريخ الرومان
7،8	مصادر دراسة التاريخ الرومانى
9،10	تحول روما من مدينه لدولة ثم الى امبراطورية
11،12	نظم الحكم فى روما.
13،14	الزراعه (انواع التربه – المناطق الزراعيه)
15،16	المحاصيل الزراعيه وتنوعها
17،18	الرعى(مناطق الرعى – انواع الحيوانات)
19،20	الجبال ودورها فى التاريخ والحضاره.
21،22	البحر واثره على التطور التاريخى والحضارى
23،24	الثروات الطبيعيه والمعدنيه واستخداماتها

جامعة قناة السويس – كلية الآداب
والعلوم الإنسانيه
قسم التاريخ والحضاره
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بيانات المحاضر

المحاضر:- د. إيمان أحمد نور الدين أبوبكر
مكان العمل:- كلية الاداب –جامعة قناة السويس

بيانات المقرر

كود المقرر:-
اسم المقرر:- حضارة وتاريخ اليونان
المكان: كلية الآداب والعلوم الانسانيه – جامعة قناة السويس

نظرة عامة/وصف المقرر

عندما تتوافر عوامل الاستقرار والامان بجانب وجود العنصر البشرى الذى يدرك تماما طبيعة بيئته، فهذا مؤشر على أنه سوف تولد حضارة فى هذا المكان، وقد تجمعت معظم هذه العوامل فى منطقة حوض البحر المتوسطفكان من الطبيعى ان تنتشر حوله المراكز الحضارية، والتى ساهم فى قيامها بشكل اساسى التكوين الطبيعى للمنطقة.

فاذا ماقمنا بدرسه تاريخ وحضارة بلاد اليونان سوف نجد ان طبيعة الارض كان لها تأثير قوى على التقدم السياسى للشعب ، فاليونان عبارة عن تكتل من الوديان الضيقه والاحواض المغلقه ، فوق كل هذا فانها مفتوحه على البحر ، والحدود المتداخلة أجبرت كل مدينه ان تصبح وحده سياسيه مستقله ، وهو ما أدى الى ظهور دولة المدينه فى اليونان، هذا فيما يخص **تأثير الطبيعه الجغرافية على نظام الحكم**

وعند دراسة **الزراعه** فنجد ايضا تاثير الطبيعه الجغرافيه عليها فالمناطق الصالحه للزراعه قليلة التساع تحيطها الجبال ، ولكن هذا لم يمنع من ان بعض هذه السهول كانت شديدة الخصوبةولكن الانتاج الزراعى لم يكن يكفى حاجات البلاد ولم يستطيعوا ان يعتمدوا عليها اقتصاديا ، وقد ادى ذلك الى ازدياد **التجاره الخارجيه** وان اصيحت بلاد اليونان تهتم **بالملاحه البحريه** .

وقد انتجت ارض اليونان بعض مقومات **الصناعه** ، فقد كانت غنية بالرخام للبناء والطمى لصناعة الاوانى الخزفية، والنحاس والفضة للمشغولات المعدنية .

الى جانب ماسبق فقد تأثرت ايضا **الديانه والاساطير الدينية** اليونانيه بقوى الطبيعة المحيطة بالانسان وتغض الالهه اذا ماحاول الانسان العبث بها.

بمحاولة تغيير الطبيعه.

الهدف الاساسى من هذا المقرر :-

1- تعريف الطالب بتاريخ وحضارة بلاد اليونان.

2- معرفة الدور الكبير الذى لعبته كل من للبيئه والمناخ فى قيام الحضارة فى اليونان.

3- اهتمام الانسان بالطبيعه وتعايشه وحرصه على ان يستخدم مايحيط به من مواد طبيعية .

4- ضروره حرص الانسان فى وقتنا الحاضر على المحافظه على البئيه واهتمامه **بها**.

عند نهاية االمقرر يكون الطالب قادرا على :-

أ- المعرفة و الفهم

knowledge and Understanding

ان يكون الخريج قادرا على فهم:-

أ-1 معني ومفهوم تاريخ وحضارة الاغريق والغرض من دراسته.

أ-2 مراحل تطور تاريخ حضارة الاغريق.

أ-3 اسباب قيام وانهيار الحضارة الاغريقية والنتائج المترتبه على ذلك

ب- المهارات الذهنية

Intellectual skills
ان يكون الخريج قادرا على:-
ب-1 تشخيص القضايا التاريخية والحضارية التى مرت ببلاد اليونان بالدروس المستفادة منها.
ب-2 تحليل اسباب الصراعات التاريخية والحضارية
جـ- المهارات المهنية
Professional Skills
ج-1 جمع وتحليل المعلومات والبيانات التاريخية والحضارية الخاصة بتاريخ الاغريق واعداد تقارير عنها وذلك بالاستعانه بتكنولوجيا المعلومات.
ج-2 القدرة على تحليل ونقد مصادر تاريخ وحضارة الاغريق.
ج-3 القدرة على استخدام الخرائط التى تخدم المقرر الدراسى.
د- المهارات العامة
General Skills
د-1 استخدام إمكانيات الحاسوب والوسائط التكنولوجية الحديثة في التواصل والإطلاع والبحث تاريخ وحضارة الاغريق.
د- 2 الالمام بلغة اجنبية واحده على الاقل للاستفاده منها فى الاطلاع على الوثائق والمراجع التى كتبت عن تاريخ وحضاره الاغريق.
د-3 القدرة على جمع الماده العلمية الخاصة بتاريخ وحضارة الاغريق من مصادرها المتنوعة.

المراجع التى يمكن الاستفاده منها :-

- حسين الشيخ: اليونان، دار المعرفة الجامعية، الاسكندرية، 2005
- فوزى مكاوى: تاريخ العالم الاغريقى وحضارته، الدار البيضاء، 1980
- كيتو: الاغريق، مترجم، القاهره 1961
- محمد فهمى عبد الباقى- التاريخ اليونانى- جامعة القاهرة- 2014.
- هـ.ج. ويلز- موجز تاريخ العالم- مترجم- القاهرة-2003.
- هـ. روز- الديانه اليونانيه القديمة- مترجم- القاهرة- 1965.
- عبد المعطى شعراوى- اساطير الاعريق- 3 اجزاء
- فوزى مكاوى- تاريخ العالم الاغريقى وحضارته- الدار البيضاء-1980.

تقسيم الدرجات

اعمال السنه : لايوجد

الامتحان :- 100 درجه
الاجمالى :- 100 درجه

نظام عرض المقرر:-

يتضمن العام الدراسى 28 اسبوع كل اسبوع ساعتين(الماده ممتده عام دراسى كامل) ، وسوف يتم دراسة الموضوعات من خلال اعطاء تمهيد عن الموضوع ثم يقوم مجموعه من الطلاب بعرض ماقاموا به من ابحاث عن الموضوع المقرر مناقشته فى الاسبوع كما يقومون بعرض مايخص الموضوع من لوحات او افلام تسجيليه، وفى النهاية تتم مناقشه ماقام الطلاب بعرضه ومعرفة كيفية الاستفاده من البيئة المحيطة بنا والحفاظ عليها.

محتويات المقرر

الاسبوع	الموضوع
1،2	عرض الموضوعات التى سيتم تدريسها فى الفصل الدراسى، تعريف بتاريخ وحضاره بلاد اليونان
3،4	التعريف بمقومات قيام الحضارة اليونانية، ومصادر تاريخ بلاد اليونان.
5،6	جغرافية بلاد اليونان وتأثيرها على الحضاره.
7،8	نظام الحكم ودور طبيعة الارض فى تشكيل هذا النظام
9،10	الزراعه (طرق الرى)
11،12	الزراعه(انواع الاراضى والمحاصيل الزراعيه)
13،14	التجارة الخارجيه

الملاحة البحرية	15،16
الصناعه	17،18
انواع المواد الخام الموجوده واستخداماتها	19،20
الديانه فى بلاد اليونان (نشأتها وتطورها)	21
الاساطير الدينية	22،23
الآلهه والألهات	24

Course Syllabus

Urban Renewal of Residential Areas

UPL 403- Elective Course

Suez Canal University, Faculty of Engineering,
Department of Architecture and Urban Planning,
First Semester, 2014-2015

Instructor Information

Instructor: Dr. Mervat Abdel Aziz M. Nasr
Office Location: SCU Campus
Telephone: -
Office Hours: Monday 12:00 pm- 01.00 pm
Wednesday 09:00 am- 12.00 pm
E-mail: Mervat_Nasr@eng.suez.edu.eg
Website:

Course Identification

Course Number: ARCH 42X- Elective 9
Course Name: Urban Renewal of Residential Areas
Course Location: University Campus
Class Times: Wednesday 12:30 pm – 3:45 pm
Prerequisites: UPL 302
Faculty Web Page: http://www.scuegypt.edu.eg/

Course Description/Overview

The course covers the study and definition of urban renewal in general and especially the problems facing the residential areas. The overpopulation is considered one of the great problems facing cities and the consequences of severe problems such as lack of housing, the spread of deteriorating neighborhoods, the informal extensions, slums and pollution as well. The course discusses:

- The regional planning and city planning as means of controlling the migration from rural areas to urban.
- The urban renewal concepts: slum clearance, up-grading and conservation.
- The impact of climate change on the cities and how to apply the sustainable policy.

Course Learning Objectives

The overarching goals of this course are:

- Identify the urbanization and its problems
- Identify the different types of the residential areas.
- Identify the manifestations of climate change on the cities.
- Clarify the interrelationship between housing and social, economic factors and the impact of climate change.
- Acquire the skill of analyzing the renewal projects for residential areas.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

44. Knowledge of the different types of the residential areas
45. Proficiency analysis of the different and programs of the urban renewal
46. Mastering the skill of analyzing the renewal projects for residential areas.
47. Apply principles of sustainability on the urban renewal projects.

Course Resources

Required Course Texts and Materials

- Ahmed Kh. Allam, Yhya Shedid, Maged El Mahdi, "Urban Renewal," - Cairo 1997
- Payne, G,"Low Income Housing in the Developing World", Liverpool University Press, 1986.
- Forbes Davisdson and Geoff Payne, Urban Projects Manual, Liverpool University Press, 1996.
- Turner, J. F. C, "Housing by People, Towards Autonomy in Building Environments", Marian Boyars, London, 1979.

- Haughton, G and Hunter, "Sustainable Cities. Jessica Kingsley, London. 1994

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Class attendance /Assignments & presentation	20%
Half Exam	20%
Final research and poster	30%
Final Exam	30%
Total Points	**100**

Course Policies

Classroom Protocol

- Students must attend all lectures on time.
- Students must be active class participation, which counts for 20% of the grade.
- Students must adhere to submit duties and assignments in time according the schedule to avoid deduction grades of delay.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Half Exam	Week 8
Final research and poster	Week 15
Final Exam	Week 16

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Urbanization and its problems
3-5		Types of the residential areas
6-8		The Urban Renewal Programs
9-10		Sustainable urbanization and development
11-12		The Urban Renewal Experiences
13		Urban Renewal Legislations
14-15		Final presentation of the researches and posters
16		Final Exam

APENDIX II: The CLIMASP Course Modules Template Example

Course	**Curriculum and Hypermedia**
Module 1	مجالات الخدمة الاجتماعية

Key Concepts	البيئة–مدمنى المخدرات– الكوارث–التسول– الأسرة
Overview	لابد أن يعرف الطالب من خلال هذا المقرر أن الأفراد الذين يمارسون العمل الأخصائيون الاجتماعيون" بالإضافة إلى المتطوعين "الاجتماعي والذين يحملون لقب والباحثين الاجتماعين يهتمون بتحديد المشكلات الاجتماعية والبحث عن أسبابها وإيجاد حلول لها ودراسة مدى تأثير هذه المشكلات على أفراد المجتمع ككل، وعلى المعنيين فيها بشكل خاص، لذلك من الضرورى الإجابة على بعض التساؤلات فى إطار ذلك المقرر وهى: ما دور الأخصائى الاجتماعى فى معالجة بعض الظواهر والمشكلات الاجتماعية التى يعانى منها المجتمع؟ما الظواهر والمشكلات التى قد تشكل معوقا أمام تقدم المجتمع ؟
Aim	الهدف من المقرر يتمثل فى مساعدة الطلاب على فهم مجالات العمل الاجتماعى سواء فى مجال رعاية مدمنى المخدرات والمسكرات أو رعاية المتسولين أو فى مواجهة الأزمات والكوارث أو فى مجال حماية البيئة.
Learning Outcomes	فى نهاية هذا المقرر ينبغى أن يكون الطالب قادرا على : – تحديد العوامل الكامنة وراء تلوث البيئة والتغيرات المناخية، تعاطى المخدرات، المشكلات الأسرية، الكوارث، التسول. – يمارس الأدوار الفعلية المهنية للأخصائى الاجتماعى فى مجال البيئة، ورعاية مدمنى المخدرات، والأسرة، ورعاية المتسولين .

Units	- الخدمة الاجتماعية فى مجال حماية البيئة – الخدمة الاجتماعية فى مجال مدمنى المخدرات – الخدمة الاجتماعية فى مجال الأسرة -- الخدمة الاجتماعية فى مجال الكوارث والأزمات – الخدمة الاجتماعية فى مجال التسول
Readings	1– عبد الله تركماني، «التنمية المستدامة والأمن الإنساني في العالم العربي»، تونس، بحث مقدم للدورة السنوية لمعهد العلاقات الدولية، جمعية الدراسات الدولية، 2006. 2– محمد بنهان سويلم : التلوث البيئي وسبل مواجهته ، الهيئة المصرية العامة للكتاب ، القاهرة 1999 3–حسن شحاته احمد : البيئة والمشكلة السكانية ، الدار العربية للكتاب ، القاهرة ، 200 4–محمد السيد، الإنسان وتلوث البيئة،الدار المصرية اللبنانية، 2006. ماهر أبو المعاطى على، الخدمة الاجتماعية ومجالات الممارسة المهنية، القاهرة:مطبعة نور الإيمان، 1999.
Activity	– التدريب بإحدى المؤسسات أو المنظمات العاملة فى مجال رعاية المتسولين أو مدمنى المخدرات أو رعاية الأسرة

	– القيام بإعداد بحث حول أحد الظواهر الاجتماعية أو المشكلات الاجتماعية. – توضيح دور الأخصائى الاجتماعى فى حل تلك الظواهر أو المشكلات – القيام بدراسة تقييميه للسياسات الاجتماعية الموضوعة من قبل الدولة لحل تلك المشكلات
Module 2	علم اجتماع البيئة
Key Concepts	البيئة- تغير المناخ- التلوث- المشكلات البيئية
Overview	لم تعد قضية البيئة فى العقد الأخير من القرن العشرين قضية ثانوية فقد اتسع مفهوم الإنسان للبيئة ليشمل جميع جوانب حياته، فالبيئة هى الهواء الذى يتنفسه وهى السلوكيات التى ينتهجها البيئة هى المجتمع وأخلاقياته باختصار البيئة هى وجوده، فالبيئة اذن ليست ترف ولكنها وجود وفكر ومنهج وعلم ، فإما نكون أو لا نكون ، فإما أن نحافظ على ما تبقى لنا على هذا الكوكب أو أن نتمادى فى قتلنا البيئة فنفنى معها وعلى ضوء هذه الاعتبارات يطرح المقرر عدة تساؤلات:ما هو مفهوم البيئة، التلوث البيئى، تغير المناخ؟ ماهى المشكلات البيئية التى يعانى منها المجتمع؟ ما دور أفراد المجتمع والدولة فى مواجهة تلك المشكلات؟ ما علاقة البيئة بالتنمية المستدامة؟
Aim	يهدف علم الاجتماع البيئى إلى ترشيد الطالب بماهية النظام البيئى وما به .

	من شتى المكونات والطاقات، وإبراز العلاقة بين البيئة والإنسان وما استحدثه بوسائله التنموية نتيجة لثورته الزراعية والصناعية من تغيرات قد تلحق بالنظام البيئى بعض الأضرار أو تؤدى به إلى الانهيار. لذلك فإن الهدف الرئيسى من دراسة علم اجتماع البيئة هو ترشيد وتثقيف الطالب الجامعى بالبيئة كى يشعر الشباب الجامعى بمسئوليته فى المجتمع بعد تخرجه كصانع قرار ومخطط ومنفذ .
Learning Outcomes	– يتعرف على البيئة ومكوناتها. - يحدد العوامل الكامنة وراء تلوث البيئة والتغيرات المناخية. - يصمم برنامج لرفع الوعى البيئى لدى المواطنين. – يمارس الأدوار الفعلية المهنية للأخصائي الاجتماعى .
Units	الفصل الأول : مفهومات البيئة وتعريفاتها الفصل الثانى: مشكلات البيئة فى مصر والحلول المقترحة لها. الفصل الثالث: ملامح الأزمة البيئية فى مصر.

	الفصل الرابع: التشريعات الخاصة بحماية البيئة.
Readings	– أحمد رشيد ، علم البيئة ، بيروت: معهد الإنماء العربى. 2– أحمد مدحت، التلوث مشكلة العصر، الكويت، سلسلة عالم المعرفة، 1990. 3– السيد عبد العاطى ، الإنسان والبيئة، بيروت: لبنان، 1994 4– حسين طه وآخرون، البيئة والإنسان، الكويت،1984 5– سوزان أحمد، الإنسان والبيئة والمجتمع، الإسكندرية: دار المعرفة الجامعية، 1999 6– محمد الجوهرى، علياء شكرى، البيئة والمجتمع، الإسكندرية: دار المعرفة الجامعية، 1995
Activity	**Overview**
	- تقييم التشريعات الخاصة بحماية البيئة. - تحديد مظاهر التدهور البيئى فى بعض المجتمعات العشوائية. - تكليف الطلاب بالمشاركة فى احد برامج التنمية الاجتماعية للمواطنين
Module 3	علم اجتماع التنمية
Key Concepts	التنمية المستدامة، التغير- التقدم- التخلف-البيئة-
Overview	تعد قضية التنمية والتحديث من القضايا التى جذبت اهتمام التنظير العالمى المتعلق بالتحديث والسعى باتجاه بناء نظام عالمى حديث يستند الى مواجهة التخلف والنهوض بالمجتمعات التى سيطرت عليها القوى الاستعمارية، وسلبت كثيرا من مواردها الأساسية،

	اضافة الى تشوية بنيتها الثقافية والاجتماعية، لذلك يحاول هذا المقرر الإجابة على عدة تساؤلات:ما أسباب تخلف مجتمعات الجنوب؟ وما هى الجهود التى بذلتها من أجل التغلب على أسباب التخلف بتنمية هذه المجتمعات؟
Aim	**الهدف من المقرر** يتمثل فى مساعدة الطلاب على فهم عملية التنمية والتحديث فى مجتمعات العالم الثالث وذلك من خلال التعرف على عوامل واليات التنمية الاجتماعية ، التعرف على مراحل العملية التنموية، والتأكيد على أهمية المشاركة الشعبية فى مشروعات التنموية ، كذلك التعرف على أسباب تخلف مجتمعات العالم الثالث ، وكيفية تحقيق النجاح فى مجتمعاتنا وذلك من خلال التعرف على التجارب التنموية الناجحة فى بعض المجتمعات مثل تركيا وماليزيا . أيضا يهدف المقرر الى تعريف الطالب كيفية التحول من التنمية إلى التنمية المستدامة وذلك من خلال التعرف على طبيعة التنمية المستدامة ومكوناتها وأبعادها وشروطها ، وأفاق التنمية المستدامة فى المجتمعات العربية والإسلامية.
Learning Outcomes	فى نهاية المقرر نتوقع من الطالب: يتذكر مبادئ التنمية المستدامة وشروطها. يناقش المشكلات التى تواجه العملية التنموية فى المجتمع . يمارس الأدوار الفعلية المهنية للأخصائي التنموى . يشارك في أحد برامج تنمية المجتمع .

Units	1–مفاهيم التنمية والتخلف 2– خصائص مجتمعات الجنوب الثقافية والاجتماعية 3– العوامل المسئولة عن تخلف مجتمعات الجنوب 4– نظريتى التحديث والتبعية 5– مبادئ التنمية المستدامة ومكوناتها وشروطها 6– دور المنظمات غير الحكومية فى التنمية المستدامة 7– التجارب التنموية الناجحة فى العالم
Readings	– على ليلة، العالم الثالث، قضايا ومشكلات، دار الثقافة للطبع والنشر والتوزيع، 1985. – روبرت دال، التحليل السياسى للتحديث، ترجمة علا أبو زيد، مركز الأهرام للترجمة والنشر، الطبعة الخامسة 1993. – صلاح هاشم، التنمية والجريمة المعولمة، وزارة الثقافة، الهيئة العامة لقصور الثقافة، 2010. – على ليلة:العالم الثالث، مشكلات وقضايا، دار الثقافة للنشر والتوزيع، 1987. – أندرية جوندر فرانك، البرجوازية الرثة والتطور الرث، ترجمة هيثم الأبوبى، أكرم ديرى، دار العودة، بيروت، 1973.

– محبوب الحق: ستار الفقر، خيارات أمام العالم الثالث، ترجمة أحمد فؤاد بلبع، الهيئة المصرية العامة للكتاب 1977. – على ليلة: تأثيرات العولمة على الخصوصية الثقافية والهوية الوطنية، مركز الدراسات الإسترتيجية والمستقبلية، جامعة الكويت، أكتوبر 2009. – عادل حماد أبو عزة، التنمية «المستدامة وأهدافها ودور تقنية المعلومات والاتصالات فيها»، قطر، مجلة العالم الرقمي، 2006، العدد 156. – عبد الله تركماني، «التنمية المستدامة والأمن الإنساني في العالم العربي»، تونس، بحث دم للدورة السنوية لمعهد العلاقات الدولية، جمعية الدراسات الدولية، 2006. – علي ليلة، «دور المنظمات الأهلية في مكافحة الفقر»، الشبكة العربية للمنظمات أهلية، 2002. – محمد عوض عبد السلام، «الأبعاد الاجتماعية والاقتصادية والثقافية للتنمية المستدامة رية الريفية الصحراوية»، القاهرة، مؤتمر المشروعات الصغيرة وآفاق التنمية المستدامة في طن العربي، 2000، جامعة الدول العربية. Sleg Fried Brenk & Dannis Church & William Hamsell & Edwar Vine & Richarel Zelinsk, «Building Sustainable Communities», Th Histanic Imperative For Change. http://www.Ecoip.com/de	

	products/prod_new.htr
Activity	**Overview**
	– التقييم الذاتي للمشروعات التنموية التي تقوم بها الدولة – تقييم الممارسات على البيئة والتنمية المستدامة في الحياة اليومية - تكليف الطلاب بالمشاركة فى احد برامج تنمية المجتمع المحلى وتقييم الرنامج

جامعة قناة السويس – كلية الآداب والعلوم الإنسانيه
قسم التاريخ والحضاره
العام الدراسى 2014–2015م.

بيانات المحاضر
المحاضر:– د. إيمان أحمد نور الدين أبوبكر
مكان العمل:– كلية الاداب –جامعة قناة السويس
مواعيد المحاضرات:–
بيانات المقرر
كود الكورس:–
اسم الكورس:– الحضارة المصرية القديمة
مكان الكورس: كلية التربية– جامعة قناة السويس
نظرة عامة/وصف المقرر

لا شك أن الانسان فى كل زمان ومكان ادرك أنه جزء من البيئة التى يعيش فيها واستطاع ان يكيف نفسه مع المناخ المحيط به، وكان هذا هو الحال بالنسبة للمصريين الذين ادركوا بوضوح معنى البيئة واهميتها بالنسبه لهم، وعرفوا باسلوبهم كيف يتعاملون معها.

وترتبط الأحداث التاريخية ووضع أسس الحضارة المحلية فى أرض مصر ارتباطا وثيقا بعوامل البيئة الجغرافية، فقد ساهمت مقومات البيئة الطبيعية فى تقدم هذه الحضارة.

وسوف نقوم فى هذا الكورس بشرح ومناقشه مجموعه من الموضوعات التى توضح تأثر الحضارة المصريه بالبيئه المصرية وكذلك محاولات الانسان المصرى بالتكيف مع البيئة ومع المناخ المحيط به وهذه الموضوعات هى:-

- **تاثير جغرافية مصر وطبيعة الارض فى ترابط الدولة ونظام الحكم** حيث تتميز مصر بالأرض المنبسطه التى سهلت ارتباط اقاليم مصر المختلفه وادى ذلك الى سهوله حكمها فقد استطاع اى ملك يحكم مصر ان يحكم مصر كلها وذلك لعدم وجود اى معوقات تعوق الاتصال، كما أن **موقعها الجغراقى المتميز** فى وسط العالم القديم سهل اتتصالها مع حضارات العالم القديم. كما توفرت لمصر **حدود طبيعية أمنه** حمتها من الغزوات الخارجية فى معظم فتراتها التاريخية.

- **نهر النيل:**- فقد اخترق البلاد من اقصى الجنوب الى اقصى الشمال وكان هذا النيل سبب قويا فى ربط شمال مصر بجنوبها، وتعايش المصرى مع النهر وقام ببناء السدود لحماية البلاد من الفيضان ثم الاستفاده من المياه المخزنه فى الزراعه فى الاوقات قلة المياه.

كما حرصوا على عدم تلويث ماء النيل وفروعه وقد اكدت النصوص المصرية دائما " أن من يلوث ماء النيل سوف يصيبه غضب الالهه"

- **الزراعه** وقد كان النيل عامل اساسى لقيام الزراعه فى مصر، لذا نجد الانسان المصرى يهتم بالحفاظ على مياه هذا النهر بان نظم رى الاراضى وشق الترع، كما قام بزراعه المحاصيل الزراعيه طبقا للمناخ المناسب لها فكانت هناك محاصيل صيقيه ومحاصيل شتوبة.

- **المنازل:**- بنيت المساكن فى مصر القديمه من المواد الموجوده فى البيئه المحيطه به، وكانت عادة تتبنى من الطمى والاخشاب وكان السبب فى اختياره بناء المنازل من الطوب اللبن وليس من الحجاره حتى تكون ملائمه للمناخ المحيط به فجدرانها تقيه من حرارة الشمس الى جانب انها تسمح للهواء بان ينفذ من كل مكان ، كما حرص على حماية المنازل من الحشرات وذلك من خلال مايحيط به من مواد طبيعية.

- **الدين والاساطير**:- ارتبطت الديانه المصريه ايضا بالبيئه المحيطه بالمصرى حيث نجده يجعل اله للنيل (حاعبى) وذلك لاهمية النهر بالنسبه له، ولاهمية الشمس قانم بحعل اله للشمس (رع)، كما انا معظم الهتته مرتيطه بالحيوانات وذلك لدور الحياون الرئيسى فى الزراعه والتى قام على اساسها الاقتصاد المصرد ويظهر فى اسطوره (هلاك البشريه) غضب الاله "رع" على البشر عندما قاموا بمحاولة تغيير الطبيعه.

الهدف الاساسي من هذا المقرر:-

1- تعريف الطالب بالحضاره المصرية القديمه ومقومات قيام هذه الحضاره
2- معرفة الدور الكبيرالذى لعبته كل من للبيئه والمناخ فى مصر فى قيام الحضارة المصريه .
3- اهتمام المصرى القديم وتعايشه وحرصه على ان يستخدم مايحيط به من مواد طبيعية .
4- ضروره حرص المصرى فى وقتنا الحاضر على المحافظه على البئيه واهتمامه بها.

عند نهاية المقرر يكون الطالب قادرا على :-

أ- المعرفة و الفهم
knowledge and Understanding
ان يكون الخريج قادرا على معرفة وفهم:-
أ-1 معنى ومفهوم الحضارة المصرية القديمة.
أ-2 مراحل تطور التاريخ والحضارة المصرية القديمة.
أ-3 الدور الذى لعبته البيئة والجغرافيا فى الحضارة المصرية القديمة.
ب- المهارات الذهنية
Intellectual skills
ان يكون الخريج قادرا على:-
ب- 1 تحليل الظواهر البيئة التى مرت فى التاريخ المصرى القديم، وكيفية استفاده المصرى القديم منها فى حياته اليومية.
جـ- المهارات المهنية
Professional Skills
ان يكون الخريج قادرا على:-
ج-1 جمع وتحليل المعلومات والبيانات التاريخية والحضارية الخاصة بتاريخ مصر القديمة وحضارتها واعداد تقارير عنها وذلك بالاستعانه بتكنولوجيا المعلومات.
ج-2القدرة على استخدام الخرائط التى تخدم المقرر الدراسى.
ج-3 القدرة على عرض المادة التاريخية والحضارية التى تخص التاريخ المصرى القديم والاستفاده منها .
د- المهارات العامة

General Skills
ان يكون الخريج قادرا على:-
د-1 استخدام امكانيات الحاسوب والوسائط التكنولوجية الحديثة فى الاطلاع والبحث فى مجال التاريخ والحضارة المصرية القديمة.
د-2 1عرض الأفكار والنظريات التاريخية الخاصة بتاريخ وحضارة المصريين القدماء بصورة مكتوبة وشفهية.

المراجع التى يمكن الاستفاده منها :-

- عبد الحليم نور الدين- تاريخ وحضاره مصر القديمه- جزئين- القاهره- 2004
- عبد الحليم نور الدين- اثار وحضاره مصر القديمه- القاهره 2004
- أحمد فخرى- مصر الفرعونيه- مكتبة الانجلو- القاهره-1957.
- بير مونتيه- الحياة اليومية فى مصر فى عصر الرعامسه- مترجم- مكتبة الاسره- 1997.
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- نيقولا جريمال- تاريخ مصر القديمه- مترجم- دار الفكر- القاهره 1993.
- سليم حسن- مصر القديمه الاجزاء من 1 الى 17.
- رشدى السعيد- نهر النيل نشأته واستخدام مياهه فى الماضى والمستقبل- دار الهلال-2001

تقسيم الدرجات

اعمال السنه 30 درجه

الامتحان 120 درجه

الاجمالى 150 درجه

نظام عرض المقرر:-

يتضمن الفصل الدراسى 14 اسبوع كل اسبوع 4 ساعات ، وسوف يتم دراسة الموضوعات من خلال اعطاء تمهيد عن الموضوع ثم يقوم مجموعه من الطلاب بعرض ماقاموا به من ابحاث عن الموضوع المقرر مناقشته فى الاسبوع كما يفومون بعرض مايخص الموضوع من لوحات او افلام تسجيليه، ثم ينتهى السبوع بمناقشه ماقام الطلاب بعرضه ومعرفة كيفية الاستفاده من البيئة المحيطة بنا والحفاظ عليها

محتويات المقرر

الاسبوع	الموضوع

1	عرض الموضوعات التى سيتم تدريسها فى الفصل الدراسى، تعريف بالتاريخ والحضارة المصريه
2	التعريف بمقومات قيام الحضارة المصرية القديمه
3	جغرافية مصر ودورها فى جعل مصر وحده واحده
4	نظام الحكم فى مصر ودور طبيعة الارض فى مركزية الحكم
5	نهر النيل واهميته بالنسبه للحضارة المصريه
6	الزراعه (طرق الرى)
7	الزراعه(المحاصيل الزراعيه)
8	المنازل (تخطيط المنازل فى عصر ماقبل الاسرات)
9	المنازل(تخطيط المنازل فى عصر الدولة الوسطى)
10	المنازل فى عصر الدولة الحديثة
11	الديانه المصريه القديمة (نشأتها وتطورها)
12	الاساطير الدينية
13	الآلهه والألهات
14	الانسان المصرى القديم ودوره فى اقامة الحضارة

اسم المقرر: علم اجتماع البيئة

كلية الآداب –قسم الاجتماع

الفصل الدراسي الثانى 2015

Instructor Information

Instructor: Dr. sahar hassany
Office Location: Faculty of Arts
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Office Hours:
Website: saharhassany1@yahoo.com

Course Description/Overview

يتكون الكتاب من ربع أقسام: يتناول القسم الأول مفهومات البيئة وتعريفاتها وعناصرها وأنواع البيئات مع عرض لمشاكل التلوث البيئى والتشريعات الخاصة بحماية البيئة مع دراسة البيئة الاجتماعية وعلاقتها بالإنسان ، ثم نظرة إلى المستقبل .

ويستعرض القسم الثانى مشكلات البيئة فى مصر والحلول المقترحة لها.

ونعرض فى القسم الثالث لملامح الأزمة البيئية ونتناول فيه للنشاطات الإنسانية المتسببة فى هدم المكونات البيئية ، والتغيرات التى طرأت على البيئة وكان لها تأثيرا سلبى عليها فى الوقت الحاضر وفى المستقبل.

ويركز القسم الرابع على التشريعات الخاصة بحماية البيئة.

Course Learning Objectives

يهدف علم الاجتماع البيئى إلى ترشيد الطالب بماهية النظام البيئى وما به من شتى المكونات والطاقات، وإبراز العلاقة بين البيئة والإنسان وما استحدثه بوسائله التنموية نتيجة لثورته الزراعية والصناعية من تغيرات قد تلحق بالنظام البيئى بعض الأضرار أو تؤدى به إلى الانهيار. لذلك فإن الهدف الرئيسى من دراسة علم اجتماع البيئة هو ترشيد وتثقيف الطالب الجامعى بالبيئة كى يشعر الشباب الجامعى بمسئوليته فى المجتمع بعد تخرجه كصانع قرار ومخطط ومنفذ .

Course Content Learning Outcomes

Upon successful completion of this course, students/teachers will be able to:

أ–1 يتعرف على البيئة ومكوناتها.

أ–2 يتعرف على ملامح أزمة البيئة .

أ–3– يتذكر أنواع البيئات

ب–1– يحدد العوامل الكامنة وراء تلوث البيئة والتغيرات المناخية.

ب–2يناقش المشكلات التى تواجه البيئة .

ب–3– يتفهم خطورة المشاكل البيئية على الاقتصاد المصري .

ج.1. يصمم برنامج لرفع الوعى البيئى لدى المواطنين.

ج.2. يمارس الأدوار الفعلية المهنية للأخصائي الاجتماعى .

د.1. يشارك في أحد برامج تنمية المجتمعات العشوائية .

د.2. يبحث عن حلول للمشاكل البيئية فى مصر.

Assignments and Grading Scheme

تقييم التشريعات الخاصة بحماية البيئة ومدى فاعليتها.

تحديد مظاهر التدهور البيئى فى بعض المجتمعات العشوائية.

تكليف الطلاب بالمشاركة فى احد برامج التنمية الاجتماعية للمواطنين (نشر الوعى بقضايا البيئة والتنمية)

Course Resources

1- أحمد رشيد ، علم البيئة ، بيروت: معهد الإنماء العربى.

2- أحمد مدحت، التلوث مشكلة العصر، الكويت، سلسلة عالم المعرفة، 1990.

3- السيد عبد العاطى ، الإنسان والبيئة، بيروت: لبنان، 1994

4- حسين طه وآخرون، البيئة والإنسان، الكويت،1984

5- سوزان أحمد، الإنسان والبيئة والمجتمع، الإسكندرية: دار المعرفة الجامعية، 1999

6- محمد الجوهرى، علياء شكرى، البيئة والمجتمع، الإسكندرية: دار المعرفة الجامعية، 1995

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		**البيئة : المفهوم وتعريفه**
3		**البيئة ومكوناتها**
4		**عناصر التوازن البيئى**
5		**ملامح أزمة البيئة**
6-7		**المشاكل البيئية**
8-9		**أبعاد مشكلة التلوث البيئى**
10-11		**مشكلات البيئة فى مصر**
12		**خطورة المشاكل البيئية على الاقتصاد المصري**

13		**الحلول والمقترحات**
14-16		**امتحان شفوى وتحريرى**

اسم المقرر: علم اجتماع التنمية
كلية الآداب –قسم الاجتماع
الفصل الدراسي الثانى 2015

Instructor Information

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Website: saharhassany1@yahoo.com

Course Description/Overview

يتناول المقرر المفاهيم الخاصة بالتنمية والتنمية المستدامة والتخلف والتقدم والتغير، كما يتناول خصائص التخلف الثقافية والاجتماعية المسئولة عن تخلف مجتمعات الجنوب، كذلك يتناول المقرر نظريات التنمية والتى من بينها نظرية التحديث والتبعية ، كذلك يركز المقرر على مبادئ التنمية المستدامة ومكوناتها ، بالإضافة إلى شروط التنمية وتحدياتها المستدامة ، أيضا أبعاد التنمية المستدامة ، ودور المنظمات غير الحكومية ودور أفراد المجتمع فى التنمية والتحديث.

ويحتوى المقرر على عرض لبعض النماذج والتجارب التنموية الناجحة فى العالم ، كما يتم تكليف الطلاب بجمع معلومات عن التجارب التنموية التى تم تطبيقها داخل أو خارج المجتمع المصرى وذلك للوقوف على أسباب نجاح أو فشل هذه التجارب التنموية

Course Learning Objectives

الهدف من المقرر يتمثل فى مساعدة الطلاب على فهم عملية التنمية والتحديث فى مجتمعات العالم الثالث وذلك من خلال التعرف على عوامل واليات التنمية الاجتماعية ، والتعرف على مراحل العملية التنموية، والتأكيد على أهمية المشاركة الشعبية فى المشروعات التنموية ، كذلك التعرف على أسباب تخلف مجتمعات العالم الثالث ، وكيفية تحقيق النجاح فى مجتمعاتنا وذلك من خلال التعرف على التجارب التنموية الناجحة فى بعض المجتمعات مثل تركيا وماليزيا . أيضا يهدف المقرر الى تعريف الطالب كيفية التحول من التنمية إلى التنمية المستدامة وذلك من خلال التعرف على طبيعة التنمية المستدامة ومكوناتها وأبعادها وشروطها ، وأفاق التنمية المستدامة فى المجتمعات العربية والإسلامية.

Course Content Learning Outcomes

Upon successful completion of this course, students/teachers will be able to:

أ-1 يتعرف على مداخل ومراحل عملية التنمية.

أ-2 يتعرف على برامج ومشروعات عملية التنمية .

أ-3- يتذكر مبادئ التنمية المستدامة وشروطها.

ب-1- يحدد العوامل الكامنة وراء نجاح أو فشل بعض المشروعات التنموية.

ب-2يناقش المشكلات التى تواجه العملية التنموية فى المجتمع .

ب-3- يتفهم أهمية الشمول والتكامل فى برامج التنمية .

ج.1. يصمم برنامج لتنمية أحدى المجتمعات المحلية.

ج.2. يمارس الأدوار الفعلية المهنية للأخصائي التنموى .

ج.3. يربط ما بين مراحل عملية التنمية المختلفة

د.1. يشارك في أحد برامج تنمية المجتمع .

د.2. يبحث عن عوامل نجاح أو فشل المشروع التنموى

Assignments and Grading Scheme

التقييم الذاتي للمشروعات التنموية التي تقوم بها الدولة.

. تقييم الممارسات على البيئة والتنمية المستدامة في الحياة اليومية

تكليف الطلاب بالمشاركة فى احد برامج تنمية المجتمع المحلى وتقييم الرنامج

Course Resources

8. على ليلة، العالم الثالث، قضايا ومشكلات، دار الثقافة للطبع والنشر والتوزيع، 1985.

9. روبرت دال، التحليل السياسى للتحديث، ترجمة علا أبو زيد، مركز الأهرام للترجمة والنشر، الطبعة الخامسة 1993.

10.صلاح هاشم، التنمية والجريمة المعولمة، وزارة الثقافة، الهيئة العامة لقصور الثقافة، 2010.

11. على ليلة:العالم الثالث، مشكلات وقضايا، دار الثقافة للنشر والتوزيع، 1987.
12. أندرية جوندر فرانك، البرجوازية الرثة والتطور الرث، ترجمة هيثم الأبوبى، أكرم ديرى، دار العودة، بيروت، 1973.
13. محبوب الحق: ستار الفقر، خيارات أمام العالم الثالث، ترجمة أحمد فؤاد بلبع، الهيئة المصرية العامة للكتاب 1977.
14. على ليلة: تأثيرات العولمة على الخصوصية الثقافية والهوية الوطنية، مركز الدراسات الإسترتيجية والمستقبلية، جامعة الكويت، أكتوبر 2009.
9- عادل حماد أبو عزة، التنمية «المستدامة وأهدافها ودور تقنية المعلومات والاتصالات فيها»، قطر، مجلة العالم الرقمي، 2006، العدد 156.

9- عبد الله تركماني، «التنمية المستدامة والأمن الإنساني في العالم العربي»، تونس، بحث مقدم للدورة السنوية لمعهد العلاقات الدولية، جمعية الدراسات الدولية، 2006.

10- علي ليلة، «دور المنظمات الأهلية في مكافحة الفقر»، الشبكة العربية للمنظمات الأهلية، 2002.

11- محمد عوض عبد السلام، «الأبعاد الاجتماعية والاقتصادية والثقافية للتنمية المستدامة للقرية الريفية الصحراوية»، القاهرة، مؤتمر المشروعات الصغيرة وآفاق التنمية المستدامة في الوطن العربي، 2000، جامعة الدول العربية.

Sleg Fried Brenk & Dannis Church & William Hamsell & Edward Vine & Richarel Zelinsk, «Building Sustainable Communities», The Histanic Imperative For Change. http://www.Ecoip.com/de-products/prod_new.html

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student

		selection
2		مفاهيم التنمية والتخلف
3-4		خصائص مجتمعات الجنوب الثقافية والاجتماعية
5-6		العوامل المسئولة عن تخلف مجتمعات الجنوب
7-8		نظريتى التحديث والتبعية
8-9		مبادئ التنمية المستدامة ومكوناتها وشوطها
10-11		دور المنظمات غير الحكومية فى التنمية المستدامة
12-13		التجارب التنموية الناجحة فى العالم
14-16		امتحان شفوى وتحريرى

Course Name: fields of Social Work
Faculty of Arts, Department of Sociology
First semester 2014/2015

Instructor Information

Instructor: Dr. sahar hassany

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Course Description/Overview

ينقسم المقرر إلى خمس مجالات ، يتناول القسم الأول دور الخدمة الاجتماعية فى المجال البيئى ونعرض فيه لمفهوم البيئة ، مفهوم المشكلة البيئية ، تغير المناخ، نماذج من المشكلات التى تواجهها البيئة مثل: التلوث البيئى ، التصحر ، الانقراض.كما يحتوى القسم على أسباب المشاكل البيئية ، والسياسة البيئية وعلاقتها بفلسفة التنمية المستدامة ، كذلك يتناول القسم موضوع التغيرات المناخية ، وتأثير تلك التغيرات على القطاعات الإنتاجية فى مصر ، ومخاطر التغيرات المناخية على مصر والعالم، والجهود المبذولة من أجل مواجهة تلك المخاطر. ودور الخدمة الاجتماعية فى مجال حماية البيئة.

ويتناول القسم الثانى دور الخدمة الاجتماعية فى مجال رعاية مدمنى المخدرات الاهتمام العالمى والمحلى بتلك المشكلة ، وأنواع المخدرات ، وأسباب انتشار المخدرات والدوافع وراء تعاطيها، والآثار المترتبة على التعاطى والإدمان، والمؤسسات التى تخدم مدمنى المخدرات والمسكرات،وجهود الدولة لمواجهة هذه المشكلة.

أما القسم الثالث فيهتم بالخدمة الاجتماعية والكوارث، ونعرض فيه لأشكال الكوارث ، ودور الخدمة الاجتماعية فى مواجهتها.

أما القسم الرابع فنعرض فيه لدور الخدمة الاجتماعية فى المجال الأسري، ونتناول فى ذلك القسم المشكلات الأسرية التى يواجهها الأفراد، ودور الخدمة الاجتماعية فى علاج تلك المشكلات سواء كان ذلك من خلال خدمة الفرد أو الجماعة أو تنظيم المجتمع.

أما القسم الخامس فنعرض فيه لدور الخدمة الاجتماعية فى مجال رعاية المتسولين، ونتناول فى ذلك القسم لظاهرة التسول، والأسباب التى تدفع الأشخاص للتسول، ودور الخدمة الاجتماعية فى مواجهة تلك الظاهرة.

Course Learning Objectives

الهدف من المقرر : يتمثل فى مساعدة الطلاب على فهم مجالات العمل الاجتماعى سواء فى مجال رعاية مدمنى المخدرات والمسكرات أو رعاية المتسولين أو فى مواجهة الأزمات والكوارث أو فى مجال حماية البيئة.

Course Content Learning Outcomes

Upon successful completion of this course, students/teachers will be able to:

أ-2 يتعرف على البرامج التى تقوم بها الدولة من أجل حماية البيئة .

أ-3- يتذكر مبادئ العمل الاجتماعى .

ب-1- يحدد العوامل الكامنة وراء تلوث البيئة والتغيرات المناخية، تعاطى المخدرات، المشكلات الأسرية، الكوارث، التسول

ب-2يناقش المشكلات التى تواجه البيئة ، والأسرة ، والمدمنين، والمتسولين .

ب-3- يتفهم أهمية مواجهة المخاطر التى تهدد البيئة .

ج.1. يطرح مجموعة من الأفكار والحلول لمجابهة المخاطر التى تهدد البيئة، الأسرة .

ج.2. يمارس الأدوار الفعلية المهنية للأخصائى الاجتماعى فى مجال البيئة، ورعاية مدمنى المخدرات، والأسرة، ورعاية المتسولين .

ج.3. يربط ما بين السياسة البيئية وفلسفة التنمية المستدامة.

د.1. يشارك في أحد البرامج العلاجية المقدمة لأفراد الأسرة أو المدمنين أو المتسولين .

د.2. يبحث عن دور ورؤية الدولة للتغيرات المناخية وتأثيرها على القطاعات الإنتاجية.

Assignments and Grading Scheme

– تقييم شدة تأثير المخاطر المناخية على موارد الرزق.

– تقييم فعالية آليات المواجهة الحالية التي تمارسها المجتمعات لتأمين وتحسين الأحوال المعيشية للمتسولين.

.– تحديد تأثير الممارسات الخاطئة على البيئة والتنمية المستدامة في الحياة اليومية

– تكليف الطلاب بالبحث عن استراتيجيات الدولة فى التصدي للمخاطر المناخية والبيئية

– وضع خطة وقائية وعلاجية لبعض المشاكل الأسرية.

– تكليف الطلاب بالبحث عن استراتيجيات الدولة فى التصدي لمشكلة الإدمان.

Course Resources

1– عبد الله تركماني، «التنمية المستدامة والأمن الإنساني في العالم العربي»، تونس، بحث مقدم للدورة السنوية لمعهد العلاقات الدولية، جمعية الدراسات الدولية، 2006.

2– محمد بنهان سويلم : التلوث البيئي وسبل مواجهته ، الهيئة المصرية العامة للكتاب ، القاهرة 1999

3–حسن شحاته احمد : البيئة والمشكلة السكانية ، الدار العربية للكتاب ، القاهرة ، 2000

4–محمد السيد، الإنسان وتلوث البيئة،الدار المصرية اللبنانية، 2006.

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5-محمد سيد فهمى ، الخدمة الاجتماعية:التطور –الطرق-المجالات، الإسكندرية: دار الوفاء لدنيا الطباعة والنشر،2007.

6-زكنية عبد القادر خليل، الخدمة الاجتماعية فى مجال رعاية المتسولين والمسجونين والمفرج عنهم، القاهرة: مكتبة الأنجلو المصرية .

7-محمد سلامة محمد غبارى، الخدمة الاجتماعية ورعاية الأسرة والطفولة والشباب، الإسكندرية: المكتب الجامعى الحديث،2005.

8-عبد المحى محمود حسن، الخدمة الاجتماعية ومجالات الممارسة المهنية، الإسكندرية: دار المعرفة الجامعية، 1996.

9-أحمد مصطفى خاطر، الخدمة الاجتماعية: مناهج الممارسة-المجالات، الآسكنرية: المكتب الجامعى الحديث، 1998.

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		**دور الخدمة الاجتماعية فى مجال البيئة**
3		**مشكلات البيئة الإجتماعية والطبيعية**
4		**تأثير التغيرات المناخية على القطاعات الإنتاجية في مصر(الزراعة – الصحة– السياحة)**
5		**الجهود المبذولة لمواجهة تأثير التغيرات المناخية .**
6-7		**دور الخدمة الاجتماعية فى رعاية مدمنى المخدرات والمسكرات**
8-9		**دور الخدمة الاجتماعية فى الكوارث**
10-11		**دور الخدمة الاجتماعية فى المجال الأسري**
12-13		**دور الخدمة الاجتماعية فى مجال رعاية المتسولين**
14-16		**امتحان شفوى وتحريرى**

Suez Canal University
Faculty of Veterinary Medicine
Wildlife Management and Zoo Medicine Department

Courses Name:

1. Environmental Conservation Policies & Practices
2. Species Extinction crisis & Environmental problems
3. Biodiversity and Nature Resources Sustainability
4. Protected Areas, Biosphere Reserves Management and Climate Change

2013-2014

Suggested Courses Syllabus Modules

Course Coordinator: Prof. Dr. Atef Mohamed Kamel Ahmed, Head of Wildlife Conservation Department, Faculty of Veterinary Medicine, Suez Canal University.

Module.1. Environmental Conservation Policies & Practices (2hs Theoretical and 2 hs Practical)

Module 1	**Environmental Conservation Policies & Practices**
Key Concepts	Environmental conservation, laws, resources sustainability, Environmental changes
Overview	As environmental concerns become ever more pressing, there is an increasing need to understand how we can effectively conserve wildlife and manage our countryside. This Environmental Conservation course gives a theoretical grounding in how populations and ecosystems work and a practical understanding of the issues surrounding environmental conservation. We teach the skills needed by conservation professionals for monitoring habitats and species and we demonstrate the importance of social and economic factors in achieving successful conservation. • Concept of sustainability and sustainable development. • Water conservation & watershed management. • Climate change, global warming, acid rain, ozone layer depletion (Kyoto protocol/2005). • Disaster management : floods, earthquake, cyclones and

	landslides. • Environment Protection Law (4/1994). • Protected areas Law (102/1983) • Issues involved in enforcement of environmental legislation. • Environment Conservation: rights and duties.
Aim	This module aims to give you an understanding of the ways in which governments have attempted to address environmental issues such as climate change, conservation, and pollution control. It discusses the role of government and other interest groups in formulating environmental policy, outlining and applying key principles used to do so.
Learning Outcomes	At the end of this module learners will be able to: • You will gain an understanding of the problems and dilemmas involved in the formation and implementation of public policies on environmental issues • the strengths and weaknesses of policies on climate change, waste, transport, agriculture and pollution • general policy principles and practices such as ecological modernization, sustainable development and Local Agenda 21, and • the role of citizen action in making and changing environmental policies

Units	Unit 1.1: Wildlife and climate change Unit 1.2: Biodiversity losses Unit 1.3: Climate change Mitigation and adaptation
Readings	• Carter N (2007) The Politics of the Environment (2nd edition) • Connolly J & Smith G (2012) Politics and the Environment: From Theory to Practice (3rd edition) • Gray S (ed) (1995) UK Environmental Policy in the 1990s • Lowe P & Ward S (eds) (1988) British Environmental Policy and Europe: Politics and Policy in Transition • Vogel D (1986) National Styles of Regulation: Environmental Policy in Great Britain and the United States • Wallace D (1995) Environmental Policies and Industrial Innovation: Strategies in Europe, USA and Japan
Activity	Overview
	Implementing the environmental conservation policies towards global climate change

CLIMASP COURSE SYLLABUS TEMPLATE 1

Course Name:

1. Environmental Conservation Policies & Practices

Suez Canal University, Faculty of Veterinary Medicine, 4th Year Undergraduate Students, 2013-2014

Instructor and Information

Instructor and Course Description: Prof.Dr. Atef Mohamed Kamel Ahmed
Office Location: Department of Wildlife Management & Zoo Medicine,
Faculty of Veterinary Medicine, Suez Canal University
Telephone: Office – +64 320701631
Office Hours: Sunday 09.30- 12.30 Tuesday 09.30- 12.30, and
Thursday 09.30 – 12.30
E-mail: atefkamel1955@hotmail.com
Website: http:// vet.scuegypt.edu.eg

Course Identification

Course Type: Undergraduate
Course Name: Environmental Conservation Policies & Practices
Course Location: Faculty of Veterinary Medicine- Suez Canal University Campus
Class Times: Thursday 9:30pm – 12:30am
Sustainability Scope: focused
Prerequisites: -

Faculty Web Page: http:// vet.scuegypt.edu.eg

Course Description/Overview

In this course we study environmental conservation from a geographical perspective reviewing the biophysical, institutional, and socioeconomic dimensions of environmental problems in order to develop more effective conservation solutions. Environmental conservation is itself a social process. Thus we pay careful to how changes in values, scientific understandings of nature, economy and politics affect conservation practice. Not only will we trace the major debates in environmental conservation but will also explore how differences in people's biophysical, economic and political surroundings have led to different perceptions of environmental problems and their solutions.

Through this class, you will develop an understanding of the major approaches to environmental conservation, their relative strengths and weaknesses, and how they developed historically. While case material will come from around the world, we begin by gaining a sense of the history of environmental conservation thought and action in the United States. While different, there are many analogous transitions in the environmental histories of other countries and regions around the world. While we cannot go into detail – key themes that many world regions share will be brought up in lecture and discussion. A range of environmental issues will be touched upon in this course including: toxic waste, soil erosion, air/water pollution, mining impacts, grazing impacts , wilderness protection, and wetland mitigation.

Course Learning Objectives

The overarching goals of this course are:

This Environmental Conservation course

1. Understand a theoretical grounding in how populations and ecosystems work and a practical understanding of the issues surrounding environmental conservation.
2. gain the skills needed by conservation professionals for monitoring habitats and species and
3. Know the importance of social and economic factors in achieving successful conservation.
4. understanding of the ways in which governments have attempted to address environmental issues such as climate change, conservation, and pollution control.

Learning outcomes Knowledge:

At the end of this module learners will be able to:

- You will gain an understanding of the problems and dilemmas involved in the formation and implementation of public policies on environmental issues
- the strengths and weaknesses of policies on climate change, waste, transport, agriculture and pollution
- general policy principles and practices such as ecological modernization, sustainable development and Local Agenda 21, and
- the role of citizen action in making and changing environmental policies

Course Resources
Course Website(s)
Required Course Texts and Materials

- Carter N (2007) The Politics of the Environment (2nd edition)
- Connolly J & Smith G (2012) Politics and the Environment: From Theory to Practice (3rd edition)
- Gray S (ed) (1995) UK Environmental Policy in the 1990s
- Lowe P & Ward S (eds) (1988) British Environmental Policy and Europe: Politics and Policy in Transition
- Vogel D (1986) National Styles of Regulation: Environmental Policy in Great Britain and the United States

Optional Course Texts and Materials : Wallace D (1995) Environmental Policies and Industrial Innovation: Strategies in Europe, USA and Japan
Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	20%
Exams	60%
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Course Schedule

Week	Date	Subject
1		Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course

		modules)
2		Environmental Conservation Policies & Practices
3		Wildlife and climate change
4		Resources Conservation on sustainable basis and Environmental changes
5		Environmental Problems and Solutions
6		Biodiversity overview. Global distribution and major threats
7		Climate change Mitigation and adaptation
8		Concept of sustainability and sustainable development.

Module.2. Species Extinction crisis & Environmental problems (2hs Theoretical and 2 hs Practical)

Module 2	2. Species Extinction crisis & Environmental problems
Key Concepts	Protected areas, Biodiversity, Endangered species, biosphere reserve, climate change
Overview	Protected areas have been used as a tool to manage natural resources for biodiversity conservation and for the well-being of people dependent on these resources. They are widely regarded as one of the most successful measures implemented for the conservation of biodiversity, drawing upon traditional and community-based approaches, governance regimes, scientific and traditional knowledge and contemporary practices of governments and conservation agencies (IUCN). The protected area has historically been the main tool for conservation action. Contemporary conservation recognizes that the properties of landscapes beyond reserves also determine the success of conservation action. This module serves to integrate these two approaches through the concept of conservation prioritization: what (and where) do we consider to be important conservation actions

	and areas, and why? The role that protected areas can play in climate mitigation and adaptation, The module covers cutting-edge quantitative and qualitative techniques in strategic conservation planning, the range of concepts and target measures of biodiversity, the inherent conflict between conservation inside and outside protected areas, and how both play out in the wider context of shared and spared land use.
Aim	The participants get a clear understanding on the concept of protected areas and Biosphere Reserves, and also learn about some good practices in marine and terrestrial protected area management. Participants also get an overview of the protected area management in Egypt.
Learning Outcomes	At the end of this module learners will be able to: 1. A closer look at the definition of a Protected Area 2. Designation and Role of protected areas in climate change 3. Types of protected areas (According to IUCN) 4. UNESCO MAB reserves have a Core Area, Buffer and Transition Zone 5. Validation, Verification and Expert 6. Review improves WDPA qualityImportance of protected area conservation standards 7. Protected areas management plan

	8. Climate change mitigation and adaptation
Units	Unit 2.1: Protected Areas Resilient to Climate Change, Unit 2.2: protected areas conserve the endangered wildlife species (In Situ Conservation)
Readings	Secretariat of the Convention on Biological Diversity (2008). Synthesis and Review of the Best Available Scientific Studies on Priority Areas for Biodiversity Conservation in Marine Areas beyond the Limits of National Jurisdiction. Montreal, Technical Series No. 37, 63 pages available from http://www.cbd.int/doc/publications/cbd-ts-37-en.pdf
Activity	Overview
	• What is the percentage of terrestrial, coastal and marine areas of biodiversity importance under protection in your country/ state? • Do you know of good practices in marine and terrestrial protected areas management your country state/ site? Share good practice from your country/ site in the discussion forum.

CLIMASP COURSE SYLLABUS TEMPLATE 2

Course Name:

2. **Species Extinction crisis & Environmental problems**

Suez Canal University, Faculty of Veterinary Medicine, 4th Year Undergraduate Students, 2013-2014

Instructor and Information

Instructor and Course Description: Prof.Dr. Atef Mohamed Kamel Ahmed
Office Location: Department of Wildlife Management & Zoo Medicine,
Faculty of Veterinary Medicine, Suez Canal University
Telephone: Office – +64 320701631
Office Hours: Sunday 09.30- 12.30 Tuesday 09.30- 12.30, and
Thursday 09.30 – 12.30
E-mail: atefkamel1955@hotmail.com
Website: http:// vet.scuegypt.edu.eg

Course Identification

Course Type: Undergraduate
Course Name: Environmental Conservation Policies & Practices
Course Location: Faculty of Veterinary Medicine- Suez Canal University Campus
Class Times: Thursday 9:30pm – 12:30am

Sustainability Scope: focused
Prerequisites: -
Faculty Web Page: http:// vet.scuegypt.edu.eg

Course Description/Overview

It is estimated that the current rate of species extinction is between 1,000 and 100,000 times more rapid than the average rate during the last several billion years. The growth of human populations, consumption levels, and mobility is the root of most of the serious threats to biodiversity today.

While learning about the negative impacts of humans on biodiversity, please keep a few things in mind. First, it is rare that humans intend to make a species go extinct, or to threaten biodiversity in some other way. Usually those impacts are the unfortunate by-products of people trying to provide a decent living for themselves or to serve some other purpose. Second, in the last 30 years or so, efforts to protect and preserve biodiversity have expanded exponentially. We will explore those efforts later in the module. As you learn about the current threats to biodiversity, resist the temptation to conclude that humans are simply foolish or short-sighted or greedy, and instead consider the larger pressures and systems that lead toward biodiversity loss. Global warming, acid rain and the depletion of the ozone layer are devastating events that humans have created in the post-industrial age. All levels of biodiversity will be impacted by these changes in the climate and atmosphere. In this module, you examine these relationships and look at how climate has influenced the diversity of life from the formation of the biosphere to the present day. You go on to discuss the actions which can be taken to mitigate the effects of climate change and the political and economic consequences of implementing such actions.

Course Learning Objectives

The overarching goals of this course are:

There are many threats to biodiversity today. The biggest ones can be remembered by using the acronym H.I.P.P.O.: **H**abitat Loss, **I**nvasive Species, **P**ollution, Human **P**opulation, and **O**verharvesting.

Habitat Loss: This occurs when a particular area is converted from usable to unusable habitat. Industrial activities, agriculture, aquaculture, mining, deforestation, and water extraction are all central causes of habitat loss.

Invasive Species: When an animal, plant, or microbe moves into a new area, it can affect the resident species in several different ways. New species can parasitize or predate upon residents, hybridize with them, compete with them for food, bring unfamiliar diseases, modify habitats, or disrupt important interactions.

Pollution: The discharge of toxic synthetic chemicals and heavy metals into the environment has a huge impact on species abundance, and can lead to extinctions. It's important to remember that substances that are "natural" can become pollution when they are too abundant in a certain area. For example, nitrogen and phosphorous are important nutrients for plant growth, but when they concentrate in water systems after being applied as agricultural fertilizers, they can cause "dead zones" that are uninhabitable for fish and other wildlife. Also, carbon dioxide is a "natural" component of the atmosphere, but is considered a pollutant when emitted by human industrial activities.

Bioaccumulation is an important concept connected with pollution. This is the process of chemicals becoming increasingly concentrated in animal tissues as they move up the food chain.

Human Population: In the year 1800, there were fewer than 1 billion people on earth, and today there are about 6.8 billion. Even without the vast increases in per capita resource use that have occurred during this period, the pressures on biodiversity would have increased during this time period simply based on population growth.

Overharvesting: This includes targeted hunting, gathering or fishing for a particular species as well as incidental harvesting such as by-catch in ocean fisheries. The megafauna extinction example earlier was an example of overharvesting causing biodiversity loss.

Climate Change

We saw that climate change is impacting ecosystems in several ways, including via temperature shifts. These shifts are making it difficult or even impossible for many species to survive. As the climate changes more and more, biodiversity will face ever greater threats. Likewise, efforts to conserve biodiversity will face ever greater challenges. Indeed, some are starting to speak about *conservation triage* as a situation in which not all species can be saved, forcing conservationists to decide which species to protect. This use of the term *triage* is adapted from its use in medical crises, such as in emergency response to natural disasters.

Learning outcomes Knowledge:

At the end of this module learners will be able to:

Students go on to discuss the actions which can be taken to mitigate the effects of climate change and the political and economic consequences of implementing such actions. The aim is to equip students with concepts and ideas necessary to understand and discuss environmental issues at the fundamental level.

The main objectives are

(1) Familiarity with the Global change about the environment (Climate change, Global warming and Ozone depletion,
(2) Understanding the key concepts of species extinction crisis and
(3) Developing a critical attitude toward environmental issues. In this module, Students examine these relationships and look at how climate has influenced the diversity of life from the formation of the biosphere to the present day.

Course Resources

Course Website(s)

Louis P. Jojman, *Environmental Ethics* (Wadsworth, 2005)

Optional Course Texts and Materials : Wallace D (1995) Environmental Policies and Industrial Innovation: Strategies in Europe, USA and Japan

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	20%
Exams	60%
Class attendance/participation	20%
Total Points	100

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Course Schedule

Week	Date	Subject
1		Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
2		Species extinction crisis, mass extinction
3		Threat of Biodiversity (H.I.P.P.O)
4		Climate change and conservation efforts
5		Environmental attitudes and concept
6		Conservation and Communities

7		Climate change and Conservation
8		Endangered species management

Module.3. Biodiversity and Nature Resources Sustainability (2hs Theoretical and 2 hs Practical)

Module 3	Biodiversity and Nature Resources Sustainability
Key Concepts	biogeography, biodiversity hotspots, Nature Resources sustainability
Overview	Introduction to Biodiversity. Elements of Biodiversity and their inter-relationships. Measuring biodiversity through time. Sources of information. Brief history of biodiversity. Mapping biodiversity hotspots. Issues of scale. Extremes of high and low biodiversity. Gradients in Biodiversity. Congruence. Value of biodiversity. Direct use value and indirect use value. Non- use value. Human impact. Species extinction. Populations, individual and genetic diversity. Threat to biodiversity. The scale of human enterprise. Management of biodiversity. General measures for conservation and sustainable use. Identification and monitoring. In-situ and ex-situ conservation. Sustainable use of components of biodiversity.
Aim	The course provides an overview on "biodiversity", mainly from a natural scientific point of view, to qualify students to critically follow the scientific and public debates on the subject and give them background knowledge for careers in research, education and consultancy. Basic biological facts relevant in the context of biodiversity will be discussed as well as methods, all in the context of

	value of organisms for ecosystem functioning and sustainable use by humans. A main goal is creation of understanding of complexity of organisms' roles and interactions. Working out of case examples provides training for literature searches and presentations. Changes of biodiversity due to human impacts, including alien species and global change, will be considered at various levels.
Learning Outcomes	At the end of this module learners will be able to: • Describe how isolation, environmental disturbance and environmental gradients contribute to global patterns of biodiversity. • Review how human activities impact on biodiversity and the environment • Evaluate the value of ecosystem services and describe methods for their valuation • Describe major climatic cycles and their impacts upon global biodiversity • Describe, critique and use social science concepts and research methods and their application in biodiversity conservation • Evaluate future projections of environmental degradation and biodiversity loss

	• Describe and evaluate strategies to mitigate for human impacts on biodiversity loss
Units	Unit 3.1: Biodiversity levels and hotspots Unit 3.2: Biodiversity components Unit 3.3: Threats to biodiversity Unit 3.4: cause of biodiversity losses Unit 3.5: Models of biodiversity and sustainability
Readings	Rice SA (2012) Encyclopedia of Biodiversity. New York: Facts On File Inc. Further reading will be provided on Campus library Online and during the module.
Activity	Overview
	Assignment 1: Generating Themes and Incentive measures. 15. Levels of biological diversity : genetic, species and ecosystem diversity. 16. Biogeographic zones of Egypt

	17. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational values 18. Biodiversity patterns and global biodiversity hot spots 19. Endangered and endemic species of Egypt. 20. Threats to biodiversity : Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions. 21. Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.

CLIMASP COURSE SYLLABUS TEMPLATE 3

Course Name:

3. **Biodiversity and Nature Resources Sustainability**

Suez Canal University, Faculty of Veterinary Medicine, 4th Year Undergraduate Students, 2013-2014

Instructor and Information

Instructor and Course Description: Prof.Dr. Atef Mohamed Kamel Ahmed

Office Location: Department of Wildlife Management & Zoo Medicine,
Faculty of Veterinary Medicine, Suez Canal University

Telephone: Office – +64 320701631

Office Hours: Sunday 09.30- 12.30 Tuesday 09.30- 12.30, and
Thursday 09.30 – 12.30

E-mail: atefkamel1955@hotmail.com

Website: http:// vet.scuegypt.edu.eg

Course Identification

Course Type: Undergraduate

Course Name: Wildlife Management & Zoo Medicine
Course Location: Faculty of Veterinary Medicine- Suez Canal University Campus
Class Times: Thursday 9:30pm – 12:30am
Sustainability Scope: focused
Prerequisites: -
Faculty Web Page: http:// vet.scuegypt.edu.eg

Course Description/Overview

Introduction to Biodiversity. Elements of Biodiversity and their inter-relationships. Measuring biodiversity through time. Sources of information. Brief history of biodiversity. Mapping biodiversity hotspots. Issues of scale. Extremes of high and low biodiversity. Gradients in Biodiversity. Congruence. Value of biodiversity. Direct use value and indirect use value. Non- use value. Human impact. Species extinction. Populations, individual and genetic diversity. Threat to biodiversity. The scale of human enterprise. Management of biodiversity. General measures for conservation and sustainable use. Identification and monitoring. In-situ and ex-situ conservation. Sustainable use of components of biodiversity.

The course provides an overview on "biodiversity", mainly from a natural scientific point of view, to qualify students to critically follow the scientific and public debates on the subject and give them background knowledge for careers in research, education and consultancy. Basic biological facts relevant in the context of biodiversity will be discussed as well as methods, all in the context of value of organisms for ecosystem functioning and sustainable use by humans. A main goal is creation of understanding of complexity of organisms' roles and interactions. Working out of case examples provides training for literature searches and presentations. Changes of biodiversity due to human impacts, including alien species and global change, will be considered at various levels.

Course Learning Objectives

The overarching goals of this course are:

- Describe how isolation, environmental disturbance and environmental gradients contribute to global patterns of biodiversity.
- Review how human activities impact on biodiversity and the environment
- Evaluate the value of ecosystem services and describe methods for their valuation

- Describe major climatic cycles and their impacts upon global biodiversity
- Describe, critique and use social science concepts and research methods and their application in biodiversity conservation
- Evaluate future projections of environmental degradation and biodiversity loss
- Describe and evaluate strategies to mitigate for human impacts on biodiversity loss

Graduate students are equipped with:

- Key techniques that are used to mitigate threats to biodiversity, including selecting nature reserves, connectivity and wildlife corridors, ecosystem restoration, sustainable yield, translocation and control of pest plants and animals.
- Key threats to biodiversity, including habitat modification and loss, unsustainable resource use, introduced species and climate change.
- a critical awareness of current problems in wildlife conservation and diseases with implications for wildlife conservation and welfare, and a new insight into veterinary interventions for the management of captive and free-living wild animals, through gaining a systematic understanding of the biological principles underpinning wild animal conservation and management, and the epidemiology, diagnosis and treatment of wildlife disease;
- basic competence in veterinary techniques and preventative medicine for wild animals;
- a conceptual and practical understanding of how established techniques of research and enquiry are used to create knowledge in the field of wild animal health, and a comprehensive understanding of scientific skills, including critical review of the scientific literature, and design and analysis of laboratory or field studies; and
- identify risks and develop climate change adaptation strategies and role of

  protected areas and Biosphere Reserves to mitigate the effect.

Course Content Learning Outcomes
Upon successful completion of this course, students will be able to:
Acquire and analyze data describing the biological and social aspects of the environment. Make management decisions about land and water that integrate relevant ecological, physical, and social information. Appreciate the natural complexity of ecosystems, and the interdisciplinary nature of their conservation. Understand the multiple values of ecosystems and the environment across the spectrum of circumstances, from urban to rural and from developed to wild. Communicate to the public that natural resource conservation is essential to long-term sustainability. Behave professionally and ethically in the management of the environment for the benefit of society.
Learning outcomes Knowledge:
Discuss and define zoo, wildlife and conservation medicine and ecosystem health in relation to human, animal and environmental health Identify diseases in Egyptian wildlife and zoo animal species (mammals and birds), Understand how a conservation medical approach can be applied in a range of practical situations, including handling of environmental problems with toxics and antibiotics/ anthelmintics and climate change.
Skills
Perform simple field necropsy techniques and sampling regimes for wildlife diagnostics and surveillance Write protocols and prepare for working with wildlife, including human safety and laws and regulations Plan / organize basic trapping / immobilization of selected wildlife species, including animal handling, anaesthesia, and method of drug delivery and subsequent monitoring.
Role of protected areas and biosphere reserves in Nature resources conservation in sustainable basis, mitigate climate change effects to prevent biodiversity losses.
Competences
Apply theory and basic methods in relation to conservation medicine and surveillance of wildlife diseases, and discuss interdisciplinary solutions Work independently and in international and interdisciplinary groups on topics regarding wildlife conservation on sustainable basis and climate change and biodiversity.
Course Resources

Course Website(s)
Required Course Texts and Materials
Rice SA (2012) Encyclopedia of Biodiversity. New York: Facts On File Inc.
Further reading will be provided on Campus library Online and during the module.
Optional Course Texts and Materials : Endangered Wildlife Species in Arab Environment, UNESCO, MAB Bulletin, Prof. Dr. Atef M. Kamel, Scientific Editor, Egypt, 2013
Assignments and Grading Scheme
Grading System
0 to 10 (where 5 is the least pass mark)
Grading Policy
Grades can be based on the following: (Example)

Assignments	20%
Exams	60%
Class attendance/participation	20%
Total Points	100

Course Policies
Late Assignments
It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.
Classroom Protocol
This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent.

You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules in the library and online
1		Levels of biological diversity : genetic, species and ecosystem diversity, values, threats and losses.
2		Biogeographic zones of Egypt
3		Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational values
4		Biodiversity patterns and global biodiversity hot spots
5		Endangered and endemic species of Egypt. Threats to biodiversity : Habitat loss, poaching of wildlife, man-wildlife conflicts, Alien invasive species.
6		Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.

Module.4 . Protected Areas, Biosphere Reserves Management and Climate Change (2 hs Theoretical and 2 hs Practical)

Module 4	Protected Areas, Biosphere Reserves Management and Climate Change
Key Concepts	Protected areas, Biodiversity, Endangered species, biosphere reserve, climate change
Overview	Protected areas have been used as a tool to manage natural resources for biodiversity conservation and for the well-being of people dependent on these resources. They are widely regarded as one of the most successful measures implemented for the conservation of biodiversity, drawing upon traditional and community-based approaches, governance regimes, scientific and traditional knowledge and contemporary practices of governments and conservation agencies (IUCN). The protected area has historically been the main tool for conservation action. Contemporary conservation recognizes that the properties of landscapes beyond reserves also determine the success of conservation action. This module serves to integrate these two approaches through the concept of conservation prioritization: what (and where) do we consider to be important conservation actions and areas, and why? The role that protected areas can play in climate mitigation and adaptation, The module covers cutting-edge

	quantitative and qualitative techniques in strategic conservation planning, the range of concepts and target measures of biodiversity, the inherent conflict between conservation inside and outside protected areas, and how both play out in the wider context of shared and spared land use.
Aim	The participants get a clear understanding on the concept of protected areas and Biosphere Reserves, and also learn about some good practices in marine and terrestrial protected area management. Participants also get an overview of the protected area management in Egypt.
Learning Outcomes	At the end of this module learners will be able to: 1. A closer look at the definition of a Protected Area 2. Designation and Role of protected areas 3. Types of protected areas (According to IUCN) 4. UNESCO MAB reserves have a Core Area, Buffer and Transition Zone 5. Validation, Verification and Expert 6. Review improves WDPA qualityImportance of protected area conservation standards 7. Protected areas management plan
Units	Unit 4.1: Protected Areas Resilient to Climate Change,

	Unit 4.2: protected areas conserve the endangered wildlife species (In Situ Conservation)
Readings	Secretariat of the Convention on Biological Diversity (2008). Synthesis and Review of the Best Available Scientific Studies on Priority Areas for Biodiversity Conservation in Marine Areas beyond the Limits of National Jurisdiction. Montreal, Technical Series No. 37, 63 pages available from http://www.cbd.int/doc/publications/cbd-ts-37-en.pdf
Activity	Overview
	What is the percentage of terrestrial, coastal and marine areas of biodiversity importance under protection in your country/ state? Do you know of good practices in marine and terrestrial protected areas management your country state/ site? Share good practice from your country/ site in the discussion forum.

Course Name:

4. Protected Areas, Biosphere Reserves Management and Climate Change

Suez Canal University, Faculty of Veterinary Medicine, 4th Year Undergraduate Students, 2013-2014

Instructor and Information

Instructor and Course Description: Prof.Dr. Atef Mohamed Kamel Ahmed
Office Location: Department of Wildlife Management & Zoo Medicine,
Faculty of Veterinary Medicine, Suez Canal University
Telephone: Office – +64 320701631
Office Hours: Sunday 09.30- 12.30 Tuesday 09.30- 12.30, and
Thursday 09.30 – 12.30
E-mail: atefkamel1955@hotmail.com
Website: http:// vet.scuegypt.edu.eg

Course Identification

Course Type: Undergraduate
Course Name: Wildlife Management & Zoo Medicine
Course Location: Faculty of Veterinary Medicine- Suez Canal University Campus
Class Times: Thursday 9:30pm – 12:30am
Sustainability Scope: focused
Prerequisites: -
Faculty Web Page: http:// vet.scuegypt.edu.eg

Course Description/Overview

Protected areas have been used as a tool to manage natural resources for biodiversity conservation and for the well-being of people dependent on these resources. They are widely regarded as one of the most successful measures implemented for the conservation of biodiversity, drawing upon traditional and community-based approaches, governance regimes, scientific and traditional knowledge and contemporary practices of governments and conservation agencies (IUCN). The protected area has

historically been the main tool for conservation action. Contemporary conservation recognizes that the properties of landscapes beyond reserves also determine the success of conservation action. This module serves to integrate these two approaches through the concept of conservation prioritization: what (and where) do we consider to be important conservation actions and areas, and why? The role that protected areas can play in climate mitigation and adaptation, The module covers cutting-edge quantitative and qualitative techniques in strategic conservation planning in side protected areas, the range of concepts and target measures of biodiversity, the inherent conflict between conservation inside and outside protected areas, and how both play out in the wider context of shared and spared land use.

Course Learning Objectives

The overarching goals of this course are:

The participants get a clear understanding on the concept of protected areas and Biosphere Reserves and World Heritage Sites, and also learn about some good practices in marine and terrestrial protected area management. Participants also get an overview of the protected area management in Egypt.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. A closer look at the definition of a Protected Area
2. Choose and Designation of new protected areas and its Role in conservation
3. Types of protected areas (According to IUCN)
4. UNESCO MAB Biosphere reserves have a Core Area, Buffer and Transition Zone Validation, Verification and Expert
5. Review improves WDPA qualityImportance of protected area conservation standards
6. Protected areas management: Assessment and plan
7. Protected Areas and Ecotourism

Learning outcomes Knowledge:
Graduate students are equipped with:

- identify risks, and develop climate change adaptation strategies and important role of protected areas and Biosphere Reserves to mitigate the hazard effect.

Skills
Perform simple field necropsy techniques and sampling regimes for role of protected areas and its values. Write protocols and prepare for working with Endangered wildlife species, including environmental safety and laws and regulations (102/1983 protected areas law). Management Plan / Assessment of protected areas. Role of protected areas and biosphere reserves in Nature resources conservation in sustainable basis, mitigate climate change effects to prevent biodiversity losses.
Competences
Apply IUCN Criteria for establishment of protected areas and UNESCO MAB basic procedures for designation of new biosphere reserve. Work independently and in international and interdisciplinary groups on topics regarding wildlife conservation in protected areas on sustainable basis and climate change mitigation and biodiversity.
Course Resources
Course Website(s)
Required Course Texts and Materials
Secretariat of the Convention on Biological Diversity (2008). Synthesis and Review of the Best Available Scientific Studies on Priority Areas for Biodiversity Conservation in Marine Areas beyond the Limits of National Jurisdiction. Montreal, Technical Series No. 37, 63 pages available from http://www.cbd.int/doc/publications/cbd-ts-37-en.pdf
Optional Course Texts and Materials : Endangered Wildlife Species in Arab Environment, UNESCO, MAB Bulletin, Prof. Dr. Atef M. Kamel, Scientific Editor, Egypt, 2013
Assignments and Grading Scheme
Grading System
0 to 10 (where 5 is the least pass mark)
Grading Policy

Grades can be based on the following: (Example)

Assignments	20%
Exams	60%
Class attendance/participation	20%
Total Points	100

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules in the library and online
1		Protected areas definition, types, role and compare between Biosphere Reserve, Bird sanctuary, world Heritage site
2		Classification of protected areas according to INCN

		Criteria
3		Protected areas management: Assessment and plan
4		Protected Areas and Ecotourism
5		Choose and Designation of new protected areas and its Role in conservation
6		Conducted Research in protected areas

JORDAN AUM

1. Course Specifics

Course Title	**Disaster and Emergency Management**
Course Number:	0505332
Course Prerequisite(s)	0505231
Course Co-requisite(s)	None
Credit Hours	Lecture: 3 CH - Lab: 0 CH
Lecture Days & Time	
Class Location	

Course Instructor/s	Dr. Ihab H. Sawalha
Syllabus Approved by:	
b. Academic Committee	
a. Department Chair	Dr. Ihab H. Sawalha

2. Academic Staff Specifics

		Office No., Location & Tel. Ext.	Office Hours	E-mail:
Dr. Ihab H. Sawalha	**Assistant Prof.**	**(05) 3294444 Ext. 5403**	**11:30-1:00 Mon-Thu**	**i.sawalha@aum.edu.jo**

3. Course Components

Resources:

Text books:

- **Moore, T. and Lakha, R. (2006).** "Tolley's Handbook of Disaster and Emergency Management: Principles and Practice", 3rd Edition. (**A softcopy is available from the instructor**).

- **Recht, E. (2004). "**Living Through a Natural Disaster". Pearson Education Limited, Essex.
(**A softcopy is available from the instructor**).

Major References:

- **Coppola, D. (2011).** Introduction to International Disaster Management. 2nd Edition. Elsevier, BH. London. (**Selected chapters are available with the course instructor**).

- **Wisner, B., Blaikie, P., Cannon, T. and Davis, I. (2003**), "At Risk: natural hazards, people's vulnerability and disasters". (**A softcopy is available from the instructor**).

Major on-line Resources:

- The United Nations Office for Disaster Risk Reduction: http://www.unisdr.org/
- UNISDR: http://www.preventionweb.net/posthfa/
- http://ipcc-wg2.gov/SREX/
- Center of Research on Disasters: http://www.cred.be/
- Asian Disaster Reduction Centre: http://www.adrc.asia/publication/index.php
- University of Washington Emergency Management: http://www.washington.edu/emergency/
- Resilient Organizations: http://www.resorgs.org.nz/Publications/
- http://eird.org/esp/educacion2/we/inform/publications/25129.html

Course Description:

This course gives students the theoretical and legislative framework for understanding natural and man-made disasters. This module brings together emergency planning, business continuity, crisis management and disaster recovery and introduces the skills and knowledge required for effective management in emergencies and disasters. This course looks at the entire spectrum of risks in the business environment together with a strong analysis of the consequences when things go wrong.

Course Objectives:

To provide students with a sound and comprehensive understanding of the following topics:

- Disaster management models;
- Vulnerability and resilience;
- Major incident management;
- Disaster Risk Reduction (DRR) strategies;
- Natural (i.e. environmental and climate change) and man-made disasters;
- International regulations and guidelines of DRR;
- Terrorism management.

Course Outcomes:

After completion of this course, student will:

1. Be able to analyze the different phases of natural and man-made disasters.
2. Be able to perform a Vulnerability and Capacity Assessment.
3. Be able to create a basic Disaster Risk Reduction plan and to communicate and discuss the structure of this plan amongst other students.
4. Be able to provide advice for real organizations on how to improve their DRR practice.
5. Apply disaster and emergency management frameworks in real case scenarios.
6. Apply the basic principles of disaster and emergency management in decision making.

Assessment Instruments

	Mark
Midterm Exam	30%
Project	20%

Participation	10%
Final Exam	40%
Total	100%

Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates
Week 1:	**Unit 1: Introduction:** Disaster sequence and Escalation of Incidents.	**Ch.1 Tolley's Handbook.**
Week 2:	**Unit 2:** The Disaster Life-Cycle Model.	**Ch.1 Tolley's Handbook.**
Week 3:	**Unit 3: Applications:** Case studies: Cyclone Tracy, El-Nino Drought, and Huang He Flood.	**Classroom Exercises and case studies**
Week 4:	**Unit 4:** Disaster types. **Unit 4:** Classification of events according to impact **and** Basic definitions **Unit 4:** Characteristics of crises.	**Ch.1 Tolley's Handbook.**
Week 5:	**Unit 5:** Classification of disasters in terms of probability **Unit 5:** Major incident management.	**Classroom discussions**
Week 6:	**Unit 6:** Causes of Disasters: The three models of disaster causes.	**Classroom discussions**
Week 7:	**Unit 7:** Sources of disasters: analysis of the business environment; environmental hazards; STEEPLED and SWOT analysis, **Exercise:** Internal & External analysis for the AUM.	**Ch.1 Tolley's Handbook.**
Week 8:	**Midterm Exam**	
Week 9:	**Unit 8:** The Hyogo Framework for Action (HFA) - UNISDR: 2005-2015. **Unit 8:** Collaboration in Disaster and Emergency Management.	

Week 10:	**Unit 9:** Disaster and emergency management systems. **Unit 9:** Monitoring of disaster and emergency management plans.	**Ch.5 Tolley's Handbook.**
Week 11:	**Unit 10:** Vulnerability and Capacity Assessment (VCA).	**Ch.5 Tolley's Handbook.**
Week 12:	**Unit 11: Exercises:** VCA for the AUM. **Unit 11: Quiz:** VCA quiz.	**Classroom Exercises and case studies**
Week 13:	**Unit 12:** How to improve the practice of DEM.	**Class discussions.**
Week 14:	**Unit 13:** Terrorism management.	**Ch.19 Tolley's Handbook.**
Week 15:	Revision and project discussions.	**Classroom discussions**
Week 16:	**Final Exam**	

Course Policies
University regulations apply to this course regarding class attendance, punctuality, exams, late submissions, absence with permission, penalties for cheating, and policies for assignments and projects, if any. Students should be aware of all those in addition to other rules and regulations stated and descried in the student handbook.

Course modules

Course	**Disaster and Emergency Management**
Module 1	**Basic Frameworks for Managing Disasters and Emergencies**
Key Concepts	Escalation of Incidents Framework. Disaster Lifecycle Framework. Disaster Phases: Before, During, and After.

Overview	This Module provides a comprehensive coverage of the concepts and definitions related to the Disaster and Emergency Management field. It is considered the basis for the next modules of this course.
Aim	Students will learn about the basic principles of managing disasters, crises, and emergencies. This includes man-made and natural disasters (i.e. those disasters related/resulting mainly from the environment degradation and climate change)
Learning Outcomes	At the end of this module, students will be able to show comprehensive understanding of: • The disaster lifecycle; • The basics of disaster and emergency management; • Various strategies required for managing disasters and emergencies before, during, and after their occurrences.
Units	**Unit 1: Introduction:** Disaster sequence and Escalation of Incidents. **Unit 2:** The Disaster Life-Cycle Model. **Unit 3: Applications:** coping with natural disasters: Cyclone Tracy, El-Nino Drought, and Huang He Flood. (Particular focus on the environmental and climate change causes).
Readings	**Coppola, D. (2011).** Introduction to International Disaster Management. 2nd Edition. Elsevier, BH. London. **Recht, E. (2004). "**Living Through a Natural Disaster". Pearson Education Limited, Essex.
Activity	**Case studies:** Cyclone Tracy, El-Nino Drought, and Huang He Flood.

Module 2	Sources and causes of natural and man-made disasters
Key Concepts	Disaster types, causes, and sources; including Man-induced, Hybrid, and Natural (environmental and climate change causes).
Overview	Every disaster occurrence has its own and unique characteristics; including the type of the occurrence, cause, and the source(s). Therefore, students should be able to determine and distinguish these factors in order to develop the necessary response techniques for the succeeding stages.
Aim	Students will be introduced to the different types, causes and sources of disasters and emergencies.
Learning Outcomes	At the end of this module, students will be able to: • Distinguish between the various types of disasters. • Identify the various causes of disaster occurrences. • Identify the various sources of disaster occurrences.
Units	**Unit 4:** Disaster types. **Unit 4:** Classification of events according to impact **and** Basic definitions **Unit 4:** Characteristics of crises. **Unit 5:** Classification of disasters in terms of probability **Unit 5:** Major incident management. **Unit 6:** Causes of Disasters: The three models of disaster causes. **Unit 7:** Sources of disasters: analysis of the business environment; environmental hazards; STEEPLED and SWOT analysis,

Readings	**Moore, T. and Lakha, R. (2006).** "Tolley's Handbook of Disaster and Emergency Management: Principles and Practice", 3rd Edition
Activity	**Exercise:** Internal & External analysis for any company (e.g. the AUM).

Module 3	**International applied frameworks of Disaster Risk Reduction (DRR)**
Key Concepts	The Hyogo Framework of Action 2005-2015 **HFA**
Overview	The **Hyogo Framework of Action 2005-2015**: is the most recognised international framework for Disaster Risk Reduction. It aims at building resilience of nations and communities world-wide to disasters, crises, and emergencies including natural (i.e. environmental) and man-made.
Aim	Students will be introduced to the HFA framework and will learn how to use it as a guideline for managing a wide range of disasters and emergencies including the Arab World and the middle East stressing on the cultural factors of different nations and communities.
Learning Outcomes	At the end of this module, students will be able to: • Interpret the significance of the HFA. • Use and apply the HFA. • Apply the knowledge gained from the HFA in particular contexts including the Middle East and Arab World. • Apply best practice of Disaster and Emergency Management in real

	organizations. • Understand how the United Nations (**UN)** sets plans and strategies for collaboration.
Units	**Unit 8:** The Hyogo Framework for Action (HFA) - UNISDR: 2005-2015. **Unit 8:** Collaboration in Disaster and Emergency Management.
Readings	http://www.unisdr.org/ http://www.unisdr.org/we/coordinate/hfa
Activity	Comprehensive in-class exercise on how to use and apply the HFA for reducing natural and man-made disasters and emergencies.

Module 4	**Disaster and Emergency Management systems and Vulnerability and Capacity Assessments**
Key Concepts	Implementing **Disaster and Emergency Management Systems** Undertaking **Vulnerability and Capacity Assessments (VAC)**
Overview	This module is significant as it shows the steps required to design and implement a comprehensive Disaster and Emergency Management system, as well as the techniques required to perform a Vulnerability and Capacity Assessments.
Aim	Students will be able to design Disaster and Emergency Management Systems, and perform Vulnerability and Capacity Assessments for different organizations, communities and nations.

Learning Outcomes	At the end of this module, students will be able to: • Develop and implement a Disaster and Emergency Management System. • Perform Vulnerability and Capacity Assessments. • Benchmark the developed disaster risk reduction plan against international standards and best practices. • Provide basic advice for real organizations on how to benchmark basic practices with best practices related to Disaster Risk Reduction.
Units	**Unit 9:** Disaster and emergency management systems. **Unit 9:** Monitoring of disaster and emergency management plans. **Unit 10:** Vulnerability and Capacity Assessment (VCA). **Unit 11: Exercises:** VCA for the AUM. **Unit 11: Quiz:** VCA quiz. **Unit 12:** How to improve the practice of DEM.
Readings	**Major Ref:** **Moore, T. and Lakha, R. (2006).** "Tolley's Handbook of Disaster and Emergency Management: Principles and Practice", 3rd Edition. **Extra reading on (VAC):** **Wisner, B., Blaikie, P., Cannon, T. and Davis, I. (2003**), "At Risk: natural hazards, people's vulnerability and disasters".
Activity	**Exercise 1:** Develop a Disaster and Emergency Management System for the AUM. **Exercise 2:** Perform VCA for the AUM and/or any selected Jordanian community. **Quiz:** VCA quiz.

Module 5	Terrorism: Concepts and Management
Key Concepts	**Terrorism:** mentality, modern structures, and management.
Overview	Terrorism is a growing phenomenon in our current times. It results in substantial disasters, crises and emergencies which should be mitigated/prevented in order to reduce damage and threat imposed on targeted people and societies.
Aim	Students will be introduced to concepts of modern terrorism, as well as the various management strategies required to counteract terrorism and terrorist activity.
Learning Outcomes	At the end of this module, students will be able to: • Understand terrorist mentality. • Interpret the reasons behind terrorist activities. • Understand the impact of terrorism and terrorist activity on the natural environment. • Develop different prevention mechanisms. • Develop strategies and action plans to counteract terrorism and terrorist activity.
Units	**Unit 13:** Terrorism management.
Readings	**Moore, T. and Lakha, R. (2006).** "Tolley's Handbook of Disaster and Emergency Management: Principles and Practice", 3rd Edition
Activity	**Exercises:** Examples and real case studies on terrorism and terrorist activities.

1. Course Specifics

Course Title	**Principles of Risk Management**
Course Number:	**0505101**
Course Prerequisite(s)	**none**
Course Co-requisite(s)	
Credit Hours	**Lecture: 3 CH - Lab: 0 CH**
Lecture Days & Time	
Class Location	
Course Instructor/s	**Mr. Abedalhay Elmughrabi**
Syllabus Approved by:	
b. Academic Committee	
a. Department Chair	**Dr. Ihab H. Sawalha**

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	Office Hours	E-mail Address

Mr. Abedalhay Elmughrabi	Lecturer	BA-F11	Mon-Thu 1:00-2:00 pm	a.elmughrabi@aum.edu.jo

3. Course Components

Resources:

- **Text book:**

  Rejda, G. (2014). Principles of Risk Management and Insurance (12th Ed.).Prentice.

- **References:**

1. Hopkin, P. (2010). "Fundamentals of Risk Management" Kogan Page.
2. ISO (2009). "ISO 31000: 2009 Risk management — Principles and guidelines". International standard. International standardization organization.
3. ISO (2009). "ISO 31010: 2009 Risk management — Risk assessment techniques". International standard. International standardization organization.

- **On line Resources:**

1. Institute of Risk Management : http://www.theirm.org/
2. Risk Management Library: http://www.praxiom.com/31000.htm

Course Description:

This course introduces the concepts of risk, risk identification, assessment and evaluation, the need for risk management, risk management practice, and Insurance as one tool of risk management. Both business and personal risk are addressed with emphasis on risk management treatment tools associated with controlling such risks. Students will be given opportunities to analyze and report business situations and to be competent in managing various risk cases. In addition, the course will provide opportunities to practice essential group skills', such as academic discussions, teamwork and debates. The course covers all types of risks; including natural (environmental); climate change risks; business risks; and operational risks.

Course Objectives:

After completion of this course, the student will be able to:

1- Explain theories and views related to risk.
2- Define the fundamental characteristics of risks; types, sources and classifications.
3- Identify the scope for enterprise risk management.
4- Describe the processes, techniques and methods associated with risk management.
5- Critically analyze the ISO-31000 model for risk management.
6- Explore the benefits of the risk management process.

Course Intended Learning Outcomes (ILOs)/Competencies:

A) **Knowledge and understanding:**

1- Demonstrate an understanding of the multidimensional nature and views of risk.
2- Appreciate and describe the in-depth variations between different contextual settings, causes, and sources in which risks may arise.
3- Understand the concepts and principles of Risk management.
4- Explain the basic concepts, elements and techniques associated with the risk management process and ISO 31000.
5- Understand the basics of crisis and disaster management.

B) **Cognitive and intellectual skills (thinking and analysis):**

1- Comprehend the application of risk management techniques in treating organizational risks
2- Explain the roots and theories of risk management.
3- Explain how risk management enhances the process of decision making.
4- Discuss how effective risk management helps in developing business strategies, operations, and compliance status.
5- Demonstrate ability to analyze the organizational environments and identify potential sources and causes of risk.

C) **Communication skills (personal and academic):**

1. Develop discussion and debating skills in issues related to risk and risk management.
2. Demonstrate innovative elaboration on topics that address issues of concern in the enterprise risk environments.
3. Exercise risk management considerations in the development and presentation of basic risk reduction ideas.

D) **Professional Skills:**

1. Articulate and explain technical and conceptual issues in relation to solving real-life practical problems taken from a diverse set of risk management applications
2. Apply the principles of effective risk management in decisions making.
3. Select, organize and analyze business basic records of which potential risks may be identified.

E) **Practical and subject specific skills (Transferable Skills):**

1. Apply the basics of ISO 31000, as well as principles of Enterprise Risk Management in real organizational contexts.
2. Understand the disaster formula and what actions that should be made to reduce potential crisis and disaster risks.

Teaching Methods:

The structure of this course is elaborated throughout lectures, classroom debates/discussions, assignments and home works.

Assessment Instruments

	Mark
First Exam	30%
Second Exam	20%
Quizzes, Homework and Participation	10%
Final Exam	40%
Total	100%

Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates

Week 1:	**Unit 1:** Introduction.	
Week 2:	**Unit 2:** Definitions of Risk; Loss exposures; Objective Risk; Subjective Risk; Chance of Loss.	
Week 3:	**Unit 3:** Definitions of Peril and Hazard (including man-made and natural). Classification of Risk: Pure and Speculative. Diversifiable and non-diversifiable Risk. Enterprise Risk.	
Week 4:	**Unit 4:** Major Personal Risks and Commercial Risks. Burdens of Risks on Society.	
Week 5:	**Unit 5:** Case Studies. Meaning and Objectives of Risk Management.	
Week 6:	**First Exam**	
Week 7:	**Unit 6:** Steps of the Risk Management process. Identifying Loss Exposures.	
Week 8:	**Unit 7:** Measuring and Analyzing Loss Exposures.	
Week 9:	**Unit 8:** Risk Treatment	
Week 10:	**Unit 9:** Implementing and monitoring the risk management program.	
Week 11:	**Unit 10:** Benefits of Risk Management. Personal Risk Management.	
Week 12:	**Second Exam**	
Week 13:	**Unit 11:** Financial Risk Management. Commodity price risk. Interest rate risk. Currency Exchange Rate risk. Managing Financial Risks.	
Week 14:	**Unit 12:** Enterprise Risk Management.	

	Emerging Risks. Terrorism Risk. Environmental and Climate Change risks. Risk Management Information Systems.	
Week 15:	**Unit 13:** Insurance and Course Overview.	
Week 16:	**Final Exam**	

Course Policies

University regulations are applied to this course, regarding class attendance; punctuality, exams, late submissions; absence with permission; penalties for cheating; and policies for assignments and projects – if any. Students should be aware of all these regulations in addition to other regulations stated and described in the student's handbook.

Course	**Principles of Risk Management**
Module 1	**Risk and Its Treatment**
Key Concepts	Risk, Loss Exposures, objective Risk, Subjective Risk, Chance of loss, Objective Probability, Subjective probability, Peril, Hazard, Pure Risk, Speculative Risk, Diversifiable Risk, Non diversifiable Risk, Enterprise Risk, Financial Risk, Market Risk, Interest rate Risk, Price Risk, Currency Risk, Strategic Risk, Operational Risk, Reputation Risk, Personal Risk, Commercial Risk, Environmental and Climate change risks.
Overview	This module is intended to introduce the students to the concept of Risk and the associated terms to it. The various types and classifications of Risk will also be explained and the burden of Risk on society will be illustrated. This will allow the students to identify the Risks embedded in personal and commercial contexts.
Aim	Students will learn about the concepts, types, and classifications of Risk.
Learning	At the end of this module, students will be able to

Outcomes	- Explain the various definitions of Risk. - Explain the meaning of Loss Exposure. - Understand the following concepts: Pure Risk, Speculative Risk, Diversifiable Risk, and Enterprise Risk. - Identify the major pure Risks that are associated with financial insecurity. - Show how risk is a burden to society.
Units	1: Definitions of Risk 2: Chance of Loss 3: Peril and Hazard 4: Classification of Risk 5: Major Personal Risks and Commercial Risks. 6: Burden of Risk on Society.
Readings	**Rejda, G. (2014).** Principles of Risk Management and Insurance (12th Ed.).Prentice.
Activity	Case study and review
Module 2	**Introduction to Risk Management**
Key Concepts	The risk Management Process. Risk Control, Risk Financing, Avoidance, Loss Prevention, Loss Reduction, Retention, Non Insurance Transfer, Insurance.
Overview	This module is intended to introduce the students to the Risk Management Process with all of its steps: Risk Identification, Risk Analysis, Risk treatment, and Risk Implementation and Monitoring.
Aim	Students will be able to apply the steps in the Risk Management Process to manage personal and commercial Risks.
Learning Outcomes	At the end of this module, students will be able to - Define Risk Management and explain the objectives of risk management. - Describe the steps in the Risk Management process. - Explain risk- control techniques: Avoidance, Loss Prevention, and Loss Reduction. - Explain the major risk-financing techniques, including: retention, Non

	insurance transfer, and Insurance. - Apply the principles of risk management to personal risk management.
Units	5: Meaning of Risk Management 6: Objectives of Risk Management. 7: Steps if the Risk Management Process. 8: Benefits of Risk Management 9: Personal Risk Management
Readings	**Rejda, G. (2014).**Principles of Risk Management and Insurance (12th Ed.).Prentice. **ISO (2009).** "ISO 31000: 2009 Risk management — Principles and guidelines".
Activity	Case study and review
Module 3	**Financial Risk Management**
Key Concepts	Commodity Price Risk, Interest Rate Risk, Currency Exchange Risk, Hedging, Enterprise Risk Management, Terrorism Risk, Climate Change Risk, RMIS, Risk Maps.
Overview	This module will enable the students understand financial and Enterprise Risk Management.
Aim	Students will be familiarized with speculative financial risks and enterprise risks with examples on the ways these two Risks can be managed.
Learning Outcomes	At the end of this module, students are expected to - Explain the meaning of Financial Risk Management and Enterprise Risk Management - Describe how the Risks of terrorism and climate change impact risk management. - Explain Risk Maps
Units	11& 12: Enterprise Risk Management, Financial Risk Management

Readings	**Rejda, G. (2014).** Principles of Risk Management and Insurance (12th Ed.).Prentice.
Activity	Review and discussion session initiating project work.
Module 4	**Insurance and Risk**
Key Concepts	Insurance, Pooling, Law of Large Numbers, Fortuitous Loss, Indemnification.
Overview	This module is intended to explain to students the Role of Insurance in Mitigating Pure Risks.
Aim	Students will be familiarized with the characteristics of Insurance, and the requirements for a Risk to be ideally insurable
Learning Outcomes	At the end of this module, students will be able to - Explain the Characteristics of Insurance. - Explain the Law of Large Numbers. - Describe the characteristics of insurable risks from the viewpoint of a private insurer.
Units	13-Definition of Insurance, Basic Characteristics of Insurance, and characteristics of ideally insurable risks.
Readings	**Rejda, G. (2014).** Principles of Risk Management and Insurance (12th Ed.).
Activity	Case study and review.

1. Course Specifics

Course Title	Food Systems Management
Course Number:	303441
Course Prerequisite(s)	303344

Course Co-requisite(s)	None
Credit Hours	Lecture: 3 CH
Lecture Days & Time	
Class Location	
Course Instructor/s	Dr. Ghada Albandak
Syllabus Approved by:	
b. Academic Committee	
a. Department Chair	

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	Office Hours	E-mail Address
Dr. Ghada Albandak	Assistant Professor	Office No. :SB-F- 42, Tel Ext. : 5604	**Mon** **Tue** **Wed** **Thu**	g.bandak@aum.edu.jo

1. Resources:

A) Text book:

1- Title: Food Service Organizations
Author: Mary B. Gregoire
Publisher: Prentice Hall
Edition: 2nd , 2013

B) References:

1- Title Agroecology, the Ecology of Sustainable Food Systems
Author Stephen R Ghessman
Publisher CRC
Edition 2nd , 2007

2- Title Managing Food and Nutrition Services
Author Sari Edelstein
Publisher Jones and Bartlett
Edition

C) Articles

1- Assuring Food Safety and Quality/Guidelines for Strengthening National Food Control Systems (joint paper by FAO and WHO).
2- Annual Reviews of Environmental Resources, Climate Change and Food Systems Sonja J. Vermeulen et. al., 2013.

D) Online resources
http://www.joe.org/joe/2006august/a2.php

2. Course Description:

This course deals with basic principles of institutional food service systems, methods of food purchasing, quality assurance, management of feeding establishment, financial planning of food services staff and application of food quality systems to institutions. It also describes agri-food systems and impact of climate change on food systems.

3. Course objectives/Learning Outcomes:

After completion of this course students will be able to:

1- Define food systems and the effect of climate change on them.
2- Explain different food quality standards used in food services.
3- Understand the principles of food service management.
4- Understand the food supply cycle chain and its role in food sustainability.
5- Describe Quality Management as GMP, GAP, ISO 22000 and their role in developing and managing Food systems.

4. Teaching Methods:

The structure of this course is elaborated throughout lectures, classroom debates, assignments, exercises, homework and projects.

5. Assessment Instruments:

	Mark
Midterm Exam	30%
Quizzes, Homework and Participation	10%
Project	20%
Final Exam	40%
Total	**100%**

6. Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates
Week 1:	Agri-food systems (Food Supply Cycle Chain, Sustainability)	
Week 2:	Impact of Climate Change on Food Systems	
Week 3:	Food, Law and Environment	
Week 4:	Assuring Food Safety and Quality: (Important Food Issues)	
Week 5:	Elements of the National Food Control System.	
Week 6:	Understanding the Joint FAO/WHO Codex Alimentarius	
Week 7:	Food Specific Issues of Developing Countries	
Week 8:	**Midterm Exam**	
Week 9:	Considerations of Food Safety and Consumer Protection	
Week 10:	Food Risk Assessment	
Week 11:	Case Studies	
Week 12:	National Food Control Agencies	
Week 13:	Food and Nutrition Services Organizational Management (Health Care Systems, School,…)	

Week 14:	Diet-based Managerial System	
Week 15:	Food Total Quality Management	
Week 16:	**Final Exam**	

7. Course Policies

University regulations are applied to this course, regarding class attendance; punctuality, exams, late submissions; absence with permission; penalties for cheating; and policies for assignments and projects. Students should be aware of all these regulations in addition to other rules and regulations stated and described in the student's handbook.

8. Module Description

Module 1	**Food Systems and climate change**
Key Concepts	Sustainable Agri-food Systems, Climate Change, Food Standards, Environment, Food Services.
Overview	• Students will be introduced during the course to the principles of agri-food systems and food supply chain cycle in order to familiarize them with environmentally sustainable food systems. • This part of the course will focus on the effect of agricultural practices on climate and environmental changes in the context of soil and underground

	water. • Followed by intensive discussion of quality standards used internationally to reinforce the traceability of food quality and systems, students will also be introduced to the environmental concerns encountered in international food laws to obtain sustainability through the cycle chain. • On the other hand, the impacts of climate change on food systems will be discussed, as global climate change is expected to be widespread, complex and temporarily variable. • Historical statistical studies and integrated assessment models provide evidence that climate change will affect agricultural yields and earnings, food prices, reliability of delivery, food quality and notably food safety. Low-income producers and consumers of food will be more vulnerable to climate change, owing to their comparatively limited ability to invest in adaptive institutions and technologies under increasing climatic risks. • Some synergies among food security, adaptation, and mitigation are feasible. However, promising interventions, such as agricultural intensification and reductions in waste will require careful management to distribute costs and benefits effectively. • Food and nutrition services are also discussed at the end of this module in order to apply the previous discussed rules at institutional level.
Aim	The aim of this module is to: • Introduce students to agri-food systems and concept of sustainability. • Outline the impact of global climate change on food systems. • Address the effect of agricultural practices on environmental issues. • Understand international food quality standards and importance of quality assurance. • Apply these standards and relevant laws to food services.

Learning Outcomes	At the end of this module the students will be able to: • Describe the food systems, food supply cycle chain and food sustainability concept. • Appreciate international concern about food security and sustainability. • Understand the international quality systems such as GMP, GAP, ISO 22000 and their role in developing the food quality management Systems. • Apply the food laws and standards concepts during the training course (Internship in Food Services.)
Units	• See above.
Readings	Some of the recommenced readings are: • Sonja J. Vermeulen, Bruce M. Campbell: "Climate Change and Food Systems" • John S.I. Ingram: "Sustainably Feeding the World".
Activities	Relevant activities: • Conducting field analysis on the local agricultural systems through visiting the Ministry of Agriculture and discussing the sustainability, food systems management, issues of concern, policies and measures used. • Running a campaign to detect the level of awareness of the community and their engagement toward local food systems in order to detect weakness and problems, and find solutions.

1. Course Specifics

Course Title	**Project Risk Management**
Course Number:	0505322

Course Prerequisite(s)	0505101
Course Co-requisite(s)	
Credit Hours	Lecture: 3 CH - Lab: 0 CH
Lecture Days & Time	
Class Location	
Course Instructor/s	Dr. Jamal Shamieh
Syllabus Approved by:	
b. Academic Committee	
a. Department Chair	Dr. Ihab Sawalha

2. Academic Staff Specifics

Dr. Jamal Shamieh	**Assistant Professor**	**Office No., Location &Tel. Ext.** BA – F5	**Office Hours** Mon. & Wed. 10:00 – 11:00	**E-mail Address** j.shamieh@aum.edu.jo

3. Course Components

Resources:

- **Text book:**

  Ward, S. and Chapman C. (2011). " How to Manage Project Opportunity and Risk: Why Uncertainty Management can be a Much Better Approach than Risk Management", 3rd Edition, Wiley.

- **Project Management Institute (2013**): "A Guide to the Project Management Body of Knowledge (PMBOK Guide)", 5th Edition

- **References:**

  Kendrick, T. (2009). "Identifying and Managing Project Risk: Essential Tools for Failure-Proofing Your Project", 2nd Edition, AMACOM, American Management Association.

- **On line Resources:**

  Jutte, B. “10 Golden Rules of Project Risk Management”, available @ http://www.projectsmart.co.uk/10-golden-rules-of-project-risk-management.html

  Social Science Research Network eLibrary, available @ http://papers.ssrn.com/sol3/DisplayAbstractSearch.cfm

Course Description:

This course introduces students to the principles of project management with focus on Project Risk Management (**PRM**) as well as performance uncertainty management processes (**PUMPs**) and how effective they can be in minimizing the impact of project threats and seize the opportunities that occur. The direct result is to deliver projects on time, on budget and with the quality results the project sponsor demands. Environmental risks encountered during various project phases will be addressed whether these risks are threatening the environment or the project execution and delivery.

Course General Objectives:

The course aims at developing students’ awareness and understanding of:

1. Main principles of project management.
2. Project lifecycle
3. PRM/PUMP principles and various definitions.
4. Seven Ws framework: who, why, what, which, wherewithal, when and where.
5. Systemic relationships and ambiguity.
6. Uncertainty quantification techniques.
7. Project related environmental risks.

Intended Learning Outcomes (ILOs)/Competencies:

F) Knowledge and understanding:

1. Demonstrate an understanding of the multidimensional nature and views of project lifecycle and project risk management (PRM).
2. Appreciate and describe the in-depth variations between different contextual settings, causes, and sources of project risk.
3. Understand the concepts and principles of PRM.
4. Understand the different PRM prevention and reduction techniques, including enterprise, financial, and insurance risk.
5. Demonstrate an understanding of PRM best practice and some International Standards.

G) Cognitive and intellectual skills (thinking and analysis):

1. Understand the rationale behind the use and application of various PRM techniques in treating organizational project risk.
2. Explain the various theories of PRM.
3. Utilize the skills gained from studying PRM to enhance decision making.
4. Discuss the impact of effective PRM in improving strategic planning, operations, and compliance status.
5. Demonstrate ability to analyze the organizational environments and identify potential sources and causes of project risk.

H) Communication skills (personal and academic):

4. Demonstrate debating skills in aspects related to project risk and PRM.
5. Exercise PRM considerations in the development and presentation of basic PRM reduction techniques.
6. Demonstrate ability to communicate effectively in project risk situations.

7. Demonstrate ability to communicate with media and other local authorities about major PRM situations.

I) Professional Skills: upon completion of this course:

4. Articulate and explain technical and conceptual issues in relation to solving real-life project risk using a range of PRM applications.
5. Apply principles of PRM in decisions making.
6. Select, organize, and analyze business basic records of which potential project risks may be identified.
7. Address Environmental risks encountered during various project phases whether these risks are threatening the environment or the project execution and delivery

J) Practical and subject specific skills (Transferable Skills):

3. Demonstrate ability to deploy International Standards and best practice, as well as principles of PRM in real organizations.
4. Understand the PRM life-cycle and what actions and alternatives need to be considered in order to reduce potential project risk occurrences.

Teaching Methods:

The course is delivered via lectures, classroom discussions, exercises, and a main project which will be submitted at the end of the course duration, i.e. every student will be asked to submit a basic Corporate Governance model developed by him/herself in order to demonstrate comprehensive understanding of the content of the course.

Assessment Instruments

	Mark
Mid-term Exam	30%
Quizzes, Homework and Participation	10%
Project	20%

Final Exam	40%
Total	100%

Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates
Week 1:	Part I Setting the scene: 1. Project lifecycle	
Week 2:	Part I Setting the scene: 2. Critical thinking versus PRM 3. Project lifecycle continued 4. The 7 Ws framework 5. PRM objectives.	
Week 3:	Part I Setting the scene: 6. Uncertainty in and around projects. 7. Uncertainty, risk and opportunity 8. Key motives for uncertainty project management	
Week 4:	Part I Setting the scene: 9. An overview of generic process frameworks	**Classroom Exercises**
Week 5:	Part II The general process in one key lifecycle stage 10. Define the process 11. Focus the process	**Classroom Exercises**
Week 6:	12. Part II The general process in one key lifecycle stage Identify all relevant sources of uncertainty, response options and conditions	
Week 7:	13. Part II The general process in one key lifecycle stage Structure all uncertainty and Clarify ownership	
Week 8:	14. Part II The general process in one key lifecycle	**Speech Delivery in**

	stage Quantify some uncertainty	**the Classroom**
Week 9:	**Mid-term exam**	
Week 10:	15. Project Management Body of Knowledge (PMBOK Guide) processes	
Week 11:	16. Risk Management Planning and Identification	
Week 12:	**17.** Qualitative Risk Analysis	
Week 13:	18. Quantitative Risk Analysis	
Week 14:	19. Risk response planning	
Week 15:	20. Risk Monitoring and Control	
Week 16:	**Final Exam**	

Course Policies

University regulations are applied to this course, regarding class attendance; punctuality, exams, late submissions; absence with permission; penalties for cheating; and policies for assignments and projects – if any. Students should be aware of all these regulations in addition to other regulations stated and described in the student's handbook.

General Policies for the Course: students must comply with:

A) Lecture Management

1- Students should behave appropriately during lectures, in order to reflect the good reputation of the university.
2- Students should grasp the course objectives from the first day of attendance in order to work on achieving these objectives through the course duration.

3- Faculty members encourage students constantly to get involved in class discussions. Therefore, students should make use of these discussions in order to enhance their educational experience.
4- Students should not leave classrooms during lectures except for compelling reasons.

B) Scientific Honesty

The university prohibits students from any actions inconsistent with scientific honesty, including cheating in exams whether by giving or receiving information, or submitting assignments done by others. In case of breach of this sort, the student will be subject to an effective university punishment, which he/she should be well aware of.

C) Late Attendance or Absence for Lectures

1- Students attending a lecture more than 10 minutes late will be marked as "late attendant", and every four late attendances will be count for one day absence.
2- Students attending the lecture more than 20 minutes late will be allowed to enter the classroom but will be marked as "absent".
3- If absences exceed 15% of the lectures, then the student will be disqualified from the course, and will get the university zero mark for the course.

D) Absence from exams

1- Absentees from a short test (quiz) will not be allowed for a make-up test.
2- Official excuses for missing any exam must be provided to the lecturer for the appropriate actions to be taken.
3- Special forms designed for absence from final exams are available at the Admission and Registration Department. The Dean of the related course must be provided with these forms by the student within seven days from the date of the missed exam in order to take the appropriate action.
4- Medical excuses must be signed officially and stamped by the Medical Centre.
5- All make up exams will be given only once during the same semester.
6- Make up for the final exam must be held during the first two weeks of the following semester.
7- No excuse will be accepted in case of failing to attend the makeup exam. There will be no other chance for another make up exam.

E) Additional Instructions

1- Cell phones must be turned off during lectures and exams.
2- Students should refer to additional references and do extra reading for the course.
3- Students should submit their assignments within the due time.
4- In case of absence or late registration for the course, the student is fully responsible for the follow up of the missed lecture.
5- Students are advised to keep copies of their assignments as a reference and record.
6- Objection on final exam result is limited to the specific procedures developed by the university. Students have to refer to the Department of Admission and Registration to view relevant details.

Course	Project Risk Management
Module 1	Project management
Key Concepts	Project life cycle (PLC), 7Ws framework, critical thinking, uncertainty, risk, opportunity
Overview	During this module, the student will be introduced to the main concepts of project management, namely speaking, the project life cycle consisting of: conceptualization, planning, execution and delivery.
Aim	To introduce students to project management various phases
Learning Outcomes	At the end of this module, students will be able to - develop the various phases of the project lifecycle, - develop the plans necessary in the planning phase, - understand the main activities in each phase.
Readings	**Ward, S. and Chapman C. (2011).** " How to Manage Project Opportunity and Risk: Why Uncertainty Management can be a Much Better Approach than Risk Management", 3rd Edition, Wiley.
Activity	Case study and review
Module 2	**Project uncertainty**
Key Concepts	Project uncertainty management process (PUMP), generic process frameworks, process definition, process focusing.
Overview	Uncertainty (risk and opportunity) in each phase of the project lifecycle is a crucial issue to be thoroughly addressed for the success of any project. Uncertainty in each phase in the project lifecycle needs to be considered separately. Uncertainties will be structured based on the uncertainty nature.
Aim	Students will be able to understand and structure the various uncertainties in each phase of the project lifecycle.
Learning	At the end of this module, students will be able to

Outcomes	- Articulate and explain technical and conceptual issues in relation to solving real-life project risk using a range of PRM applications. - Apply principles of PRM in decisions making. - Select, organize, and analyze business basic records of which potential project risks may be identified. - Address Environmental risks encountered during various project phases whether these risks are threatening the environment or the project execution and delivery
Readings	Lynn R. Kahle, Eda Gurel-Atay, Eds (2014). Communicating Sustainability for the Green Economy. New York: M.E. Sharpe. ISBN 978-0-7656-3680-5.
Activity	Case study and classroom exercises.
Module 3	**Project Management Body of Knowledge (PMBOK Guide) processes**
Key Concepts	Risk planning, identification, qualitative analysis, quantitative analysis, response planning, monitoring and control.
Overview	PMBOK addresses project management and project uncertainty management in a sequential logical manner: risk planning, identification, qualitative analysis, quantitative analysis, response planning, monitoring and control.
Aim	To familiarize the students with a worldwide acceptable project risk management approach.
Learning Outcomes	At the end of this module, students are expected to conduct project uncertainty: - planning, - identification, - qualitative analysis, - quantitative analysis, - response planning, - monitoring and control.
Readings	**Project Management Institute (2013**): "A Guide to the Project Management Body of Knowledge (PMBOK Guide)", 5th Edition
Activity	Review, classroom exercises, project presentations by students.

1. Course Specifics

Course Title	Introduction to Economics
Course Number:	900150
Course Prerequisite(s)	
Course Co-requisite(s)	None
Credit Hours	Lecture: 3 CH - Lab: 0 CH
Lecture Days & Time	Mon-Thu.
Class Location	
Course Instructor/s	Mahmoud Karasneh
Syllabus Approved by:	
b. Academic Committee	
a. Department Chair	Dr. Aziz Yousif

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	Office Hours	E-mail Address
Mahmoud Karasneh	Lecturer		Daily AM	m,karasneh@aum.edu.jo

3. Course Components

Resources:

- **Text book:**

1.Macconnell,.C, Brue, Flynn. Sean and Grant. Randy(2012) “Macrocosmic”,19th edition. MaGraw Hall

2.Robert N. Stavins. "Economics of the Environment: Selected Readings", fifth edition.

- **References:**

1.Parkin, Michael (2010)" Economics" 10th edition Prentice Hall

2.Barry C. Field & Martha K. Field "Environmental Economics: An Introduction", 5th edition

- **On line Resources:**

1.The International Monetary Fund (IMF): http://www.imf.org
2. world bank: http://www.worldbank.org
3. Food and agriculture organization of the United Nation http://www.fao.org

Course Description:

In Introduction to Economics, we take an overall view of the study of how scarce resources are allocated. Our goal is to understand the behavior of economic aspects like: supply, demand, consumer behavior, and producer behavior. We will also discuss issues such as government intervention. Among other things, in this course we will examine the basic understanding of many facts of modern economic activity. This course focus on the one of the most important concept in the modern economics theory which is the" Scarcity" and the impact of the human activities on the natural resources, This holds true for environmental economics as well. However, environmental resources differ from other goods that economists study in that there is usually no market for them. Thus, government policies are needed to maintain and improve environmental quality.

The course also will pay attention to the Climate Change and its impact on humane preferences, tacking in consideration the costs and benefits of dealing with Climate Change.

Course Objectives:

By the end of the course, students are expected to

1.Be able to evaluate Demand and Supply opportunity
2.Be able to determine the consumer Preferences and Choices.
3.Be able to Identify and organize and the market structure .
4. Be able to provide clear Idea about The Economic Problem.
5.Be able to provide the right conclusions about the Economic Growth.
6. Be able to think critically about issues relating to natural recourses.
7. Be able to discuss the impact of using Green energy on the production efficiency.
8. Be able to determine the optimal allocation for the production factors that will maximize the benefits for both individual and society.

Course Outcomes:

After completion of this course, the student will be able to:
1. the language of Economics.
2. the basic methodology and models used in this area and their application to real-world situations by using these models, the ability to analyze hypothetical and/or real-world situations that occur in our economy.
3. Explain key concepts related to the human behavior and its impact on the economics recourses.
4. discuses the impact of government intervention on the free market system.
5. discuses the impact of Market failure on the market system and humane choices.
6. Explain how the government can use Externality to reduce the pollution and support Green firms.
7. Understand the concepts and notions of economics.
8. Understand the concept of Demand and Supply..
9. Understand the concept of The balance of payments
10. Understand the concept of Exchange Rate,
11. Understand the concept of Deficits
12. Understand the concept of Business cycles, Unemployment, and inflation
13. Evaluate various economic alternatives.
14. Explain the role of the government intervention in minimizing the climate change effect.
15. Understand the impact of the economic growth on the environment and Standards of Living
16. Understand What is the relationship between economic growth and the environment.
17. Understand How can economic development become environmentally sustainable.18. Explain how positive and negative externalities cause under- and over allocations of resources.

Teaching Methods:

The structure of this course is elaborated throughout lectures, classroom debates, assignments, exercises, homework and projects. Add text here

Assessment Instruments

	Mark
First Exam	15%
Second Exam	15%
Project	10%
Quizzes, Homework, Assignment and Participation	10%
Final Exam	50%
Total	100%

Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates
Week 1:	Limits, Alternatives, and Choices	
Week 2:	The Market system and circular flow	
Week 3:	Demand , Supply and Market Equilibrium	
Week 4+5:	Market Failures: Public Goods and Externalities	
Week 5:	First Exam	
Week 6+7	Resources, Environment, and Economic Development	
Week 8+9	An introduction to Macroeconomics	
Week 10	Measuring Domestic output and national Income	
Week 11:	Second Exam	
Week 12:	Economic Growth	
Week 13+14:	Business cycles, Unemployment, and inflation	

Week 15	**Overall Course Review, and Assignment discussion**	
Week 16	**Final Exam**	

Course Policies

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4- In case of absence or late registration for the course, the student is fully responsible for the follow up of the missed lecture.
5- Students are advised to keep copies of their assignments as a reference and record.
6- Objection on final exam result is limited to the specific procedures developed by the university. Students have to refer to the Department of Admission and Registration to view relevant details.

Course modules

Course	Introduction to Economics
Module 1	**INTRODUCTION TO ECONOMICS AND THE ECONOMY**
Key Concepts	Economics, scarcity microeconomics, macroeconomics, natural resources Economics prospective
Overview	Economics is the social science concerned with how individuals, institutions, and society make optimal (best) choices under conditions of scarcity. like other sciences Economists view things from a unique perspective that envisions individuals and institutions making rational decisions by comparing the marginal benefits and marginal costs associated with their actions. all economics choices must build based on cost benefits analysis. Scarcity considered one of the most important concepts in the Economics where the institutions must deal with the fact that we have Scarce" limited" economic resources.

Aim	Students will learn how to distinguish between microeconomics and macroeconomics and explain how economists go about their work as social Scientists.
Learning Outcomes	At the end of this module, students will be able to - Define economics and the features of the economic perspective - List the categories of scarce resources and delineate the nature of the economizing problem . - Apply production possibilities analysis, increasing opportunity costs, and economic growth - learn how to bullied their own cost benefits analysis.
Units	- Limits, Alternatives, and Choices
Readings	Macconnell,.C, Brue, Flynn. Sean and Grant. Randy(2012) "Macrocosmic",19th edition. MaGraw Hall. http://www.economist.com/
Activity	- review
Module 2	The Capitalism and the Market system
Key Concepts	Capitalism, Socialism
Overview	Every society needs to develop an Economics Systems which is a particular set of institutional arrangements and a coordinating mechanism to respond to the economizing problem. The economic system has to determine what goods are produced, how they are produced, who gets them, how to accommodate change, and how to promote technological progress, from the Capitalism to Socialism in this model we will compare between different market systems and its impact on human choices and natural resources. and how the leads to what know as the market deficit and market surplus.

Aim	Students will be able to improve their knowledge about different types of market systems, and decide which system is the best.
Learning Outcomes	At the end of this module, students will be able to - Differentiate between a command system and a market system - List the main characteristics of the market system. - Explain how the market system decides what to produce, how to produce it, and who obtains it. - Discuss how the market system adjusts to change and promotes progress - Explain the relationship between the Climate change and the capitalism
Units	1- The Market System and the Circular Flow
Readings	Macconnell,.C, Brue, Flynn. Sean and Grant. Randy(2012) "Macrocosmic",19th edition. MaGraw Hall. - Hayes, Knox" Constructing Carbon Market Spacetime: Climate change and the onset of neo-modernity" School of Public Policy. - D. Z. Sui and D. W. Rejeski" Environmental Impacts of the Emerging Digital Economy: The E-for-Environment E-Commerce?" Journal of Environmental Management Vol. 29, No. 2, pp. 155–163.
Activity	Review
Module 3	**Market Mechanism**
Key Concepts	Demand, Supply, Market Equilibrium, Efficient Allocation, Uncertainty, government intervention, climate change, productive efficiency, price ceiling and price floor.
Overview	Market mechanism refer to the use of money exchanged by buyers and sellers with an open and understood system of value and time trade-offs to produce the best distribution of goods and services. The use of the market mechanism imply in a free market; there can be captive or controlled markets that seek to use supply and demand, or some other form of

	charging for scarcity, both in social situations and engineering.
Aim	Students' knowledge about the Market Mechanism and different concepts related to the demand supply and the role of the government in redistribute the production factors.
Learning Outcomes	At the end of this module, students are expected to - Describe demand and explain how it can change. - Describe supply and explain how it can change. - Relate how supply and demand interact to determine market equilibrium. - Explain how changes in supply and demand affect equilibrium prices and quantities. - Identify what government-set prices are and how they can cause product surpluses and shortages - Explain the role of the government intervention in minimizing the climate change effect
Units	- Demand , Supply and Market Equilibrium
Readings	- Macconnell,.C, Brue, Flynn. Sean and Grant. Randy(2012) "Macrocosmic",19th edition. MaGraw Hall. - "Uncertainty and Climate Change Intervention: An Introduction to the Economics of Climate Change" by Jisung Park The Journal of Sustainable Development. http://www.consiliencejournal.org/index.php/consilience/article/view/8
Activity	Review
Module 4	**Market Failures: Public Goods and Externalities**
Key Concepts	Market failures, excludability, public goods, free-rider problem, cost-benefit analysis, Externalities, The Invisible Hand, Marginal social cost, Environmental Economics, social welfare , optimal reduction of an externality

	and Carbon Taxes.
Overview	A market failure happens in a particular market when the market produces an equilibrium level of output that either over allocates or under allocates resources to the product being traded in the market. In competitive markets that feature many buyers and many sellers, market failures can be divided into two types: Demand-side market failures occur when demand curves do not reflect consumers' full willingness to pay; supply-side market failures occur when supply curves do not reflect all production costs, including those that may be borne by third parties. Market failures present government with opportunities to improve the allocation of society's resources and thereby enhance society's total well-being. But even when government correctly identifies the existence and cause of a market failure, political pressures may make it difficult or impossible for government officials to implement a proper solution.
Aim	Students will be able to understand the general aspect of market failure and the role of externalities.
Learning Outcomes	At the end of this module, students will be able to - Differentiate between demand-side market failures and supply-side market failures. - Explain the origin of both consumer surplus and producer surplus, and explain how properly functioning markets maximize their sum, total surplus, while optimally allocating resources. - Describe free riding and public goods, and illustrate why private firms cannot normally produce public goods. - Explain how positive and negative externalities cause under- and over allocations of resources. - Show why we normally won't want to pay what it would cost to eliminate every last bit of a negative externality such as air pollution
Units	- Market Failures: Public Goods and Externalities
Readings	- Macconnell,.C, Brue, Flynn. Sean and Grant. Randy(2012) "Macrocosmic",19th edition. MaGraw Hall.

	- J Norregaard, V Reppelin-Hill "Taxes and tradable permits as instruments for controlling pollution: theory and practice" IMF working paper series -
Activity	**Review**
Module 5	**GDP, Growth, and Instability**
Key Concepts	business cycle, unemployment, inflation, national income accounting, nondurable goods, taxes on production and imports, economic growth, Infrastructure. leader countries, natural capital, population momentum, Sustainable Development, and learning by doing
Overview	The determinants of economic growth to which we can attribute changes in growth rates include four supply factors (changes in the quantity and quality of natural resources, changes in the quantity and quality of human resources, changes in the stock of capital goods, and improvements in technology); one demand factor (changes in total spending); and one efficiency factor (changes in how well an economy achieves allocative and productive efficiency).The concept of sustainable development attempts to combine economic and environmental goals. Sustainable techniques for agricultural production, energy use, natural resource management, and industrial production have significant potential, but have yet to be widely adopted. A sustainable global economy also implies limits on population and material consumption.
Aim	Students will be able to understand the economic growth and its impact on

	production factors and the living standard for human
Learning Outcomes	At the end of this module, students will be able to - Interpret how macroeconomics studies both long-run economic growth and short-run fluctuations in output and unemployment. - Explain why economists focus on GDP, inflation, and unemployment when assessing the health of an entire economy. - Discuss why sustained increases in living standards are a historically recent phenomenon. - Identify why saving and investment are key factors in promoting rising living standards. - Describe why economists believe that "shocks" and "sticky prices" are responsible for short-run fluctuations in output and employment. - List and explain some limitations of the GDP measure - Discuss differing perspectives as to whether growth is desirable and sustainable - Discuss the impact of the economic growth on the environment and Standards of Living - Understand What is the relationship between economic growth and the environment. - Understand How can economic development become environmentally sustainable.
Units	1. AN INTRODUCTION TO MACROECONOMICS 2. MEASURING DOMESTIC OUTPUT AND NATIONAL INCOME 3. ECONOMIC GROWTH 4. Resources, Environment, and Economic Development
Readings	1. Barry C. Field & Martha K. Field "Environmental Economics: An Introduction", 5th edition. 2. **Macconnell,.C, Brue, Flynn. Sean and Grant. Randy(2012)**

	“Macrocosmic”,19th edition. MaGraw Hall.
Activity	- review - group discussions and presentations

1. Course Specifics

Course Title	**Business Law**
Course Number:	**0502314**
Course Prerequisite(s)	**Non**
Course Co-requisite(s)	**Non**
Credit Hours	**Lecture: 3 CH - Lab: 0 CH**
Lecture Days & Time	**Mon. & Wed. 2:30-4:00 PM**
Class Location	**BA-G09**
Course Instructor/s	
Syllabus Approved by:	
b. Academic Committee	
a. Department Chair	**Dr. Jamil Samawi**

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	Office Hours	E-mail Address
Dr. Jamil Samawi	Assistant Professor	B-S 41		j.samawi@aum.edu.jo
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3. Course Components

Resources:

Text book:

- 1. Mallor J. (2013) 'Business Law: The Ethical, Global, and E-Commerce Environment' 15th ed McGraw-Hill.

- **References:**

4. The Jordanian Constitution.
5. The Jordanian Commercial Law.
6. The Jordanian environment protection law.

- **On line Resources:**

1. Students are required to log on to the online learning center at: http://www.mhhe.com/mallor15e, to explore chapter by chapter test questions , links and further online study tools for business law.

Course Description:

The aim of this course is to review basic legal principles and sources of contract law, background of law and legal theory. The following topics are covered in detail: formation of contracts, modifications, terminations, remedies, pricing, patent, business organizations, company law, sales of goods, and transfer of ownership rights, employment law.

Course General Objectives:

Essentially, the course seeks to attain the following objectives:

1. Identify the importance and scope of law in general and business law in particular and develop an understanding of the legal aspects in business.
2. Introduce key legal terms and present fundamental legal concepts and procedures.
3. Provide and explore court cases from the United States and Jordan.

Course Intended Learning Outcomes (ILOs)/Competencies:

K) **Knowledge and understanding:**

1. Understand the nature of law and different types of laws.
2. Explain the concepts of jurisdiction.
3. Describe law supremacy.
4. Explain the functions of law.
5. Explore legal court cases and decisions.
6. Identify property rights and ownership transfer and property contracts.
7. Describe different commercial papers and their legal power.
8. Identify the ethical and legal issues in environmental protection and climate change.

L) **Cognitive and intellectual skills (thinking and analysis):**

1. Apply key legal and business law terms in future work.
2. Explain the theories of business law.
3. Analyze how business law can govern future dealings and protect rights.

M) **Communication skills (personal and academic):**

8. Develop and apply business law knowledge.
9. Exercise contracting in the development and presentation of ideas.
10. Develop effective speech introductions, relevant content and conclusions.
11. Participate actively in classroom debate, assignments and speech deliveries.
12. Evaluate classroom speeches, other student presentations, and own input in a structured professional manner away from judgment of legal cases.
13. Use legal knowledge, group presentation to improve better way of communication and team work.

N) **Professional Skills:**

8. Collaborate with small group team members to assess and argue for or against certain communication issues based on interpersonal and intercultural differences.
9. Apply conflict management strategies for sensitive issues that have a lot of passion statements.
10. Demonstrate leadership skills by mastering effective interpersonal and intercultural tolerance and inclusiveness in communication.
11. Apply the principles of effective supervision and delegation in addressing communication issues.

O) **Practical and subject specific skills (Transferable Skills):**

5. Communication skills, covering both written and oral communications.
6. Problem-solving skills, relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information.
7. Study skills needed for continuing professional development.
8. Apply creative and critical thinking skills in carrying out studies.
9. Interpersonal skills, relating to the ability to interact with other people and to engage in team-working.
10. Time-management and organizational skills, as evidenced by the ability to plan and implement efficient and effective modes of working.

Course Intended Learning Outcomes and its Relation with Program Outcomes (PO's*):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
A1, A2, B1, C1,D4		**x**	**x**		**x**				
A3, A6,A7, C2,C3, D1, E2			**x**		**x**				

B3, C6 D4, C4, C5, D3, E3	**x**				**x**				**X**
A3, A6, A7, C2, C6, D2, E4						**x**			**X**
A4, B2, C3, D1, E2	**x**					**x**			
A3, A6 ,C3		**x**			**x**				
A7, E5, E6				**x**			**x**	**x**	

*Programs Outcomes (PO's) are available at the academic department.

Teaching Methods:

The structure of this course is elaborated throughout lectures, classroom debates, assignments, exercises, homework and projects.

Assessment Instruments

	Mark
First Exam	**15%**
Second Exam	**15%**
Quizzes, Homework and Participation	**10%**
Project	**10%**
Final Exam	**50%**
Total	100%

Course Academic Calendar

Week	Basic and support material to be covered	Resources	Homework/reports and their due dates
Week 1	▪ **Introduction to The Course** ▪ **Nature of law**	Syllabus Chapter 1 (Mallor)	• Class Reading & Discussion • Class exercise
2	▪ **The resolution of private disputes and court jurisdiction**	Chapter 2 (Mallor)	• Reading & Discussion • class exercise
3	▪ **Business and the Constitution** ▪ **Unconstitutional laws** **First Exam**	Chapter 3 (Mallor)	• Reading & Discussion in Class. • Class exercise
4	▪ **Criminal Law and Procedure**	Chapter 5 (Mallor)	▪ Reading & Discussion in Class
5 6	▪ **Intellectual Property and Unfair Competition** **Second Exam**	Chapter 8 (Mallor)	▪ Reading & Discussion in Class ▪ Court cases
7 8	▪ **Contracts, business offers and acceptance**	Chapters 9 & 10 & 11 (Mallor)	▪ Reading & Discussion in Class ▪ Court cases
9	▪ **Property ownership** ▪ **Landlord and tenant**	Chapter 23 & 25 (Mallor)	▪ Reading & Discussion in Class ▪ Court cases
10	▪ **Drafting Commercial papers**	Handouts Jordan commercial law	▪ Reading & Discussion in Class ▪ Court cases
11	▪ **Ethical and legal issues in environmental protection and climate change**		

	(Handouts will be provided during course time)
10	▪ **The last two weeks will be dedicated for student group presentation of topics, cases, and revision. Final Exam**

Course Policies

University regulations are applied to this course, regarding class attendance; punctuality, exams, late submissions; absence with permission; penalties for cheating; and policies for assignments and projects – if any. Students should be aware of all those in addition to other rules and regulations stated and described in the student's handbook.

1. Course Specifics

Course Title	**Disaster and Emergency Management (DEM)**
Course Number:	0505332
Course Prerequisite(s)	0505231
Course Co-requisite(s)	None
Credit Hours	Lecture: 3 CH - Lab: 0 CH
Lecture Days & Time	
Class Location	
Course Instructor/s	Dr. Ihab H. Sawalha , Nancy Refai
Syllabus Approved by:	
b. Academic Committee	Nancy Refai
a. Department Chair	Dr. Ihab H. Sawalha

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel.	Office Hours

Dr. Ihab Sawalha	Assistant Professor	05 3294444 Ext. 5403		i.sawalha@aum.edu.jo
Nancy Refai	Lecturer	BA-F 31 05 3294444 Ext. 5410	Daily 11:30 - 1:00 AM	n.refai@aum.edu.jo

3. Course Components

Resources:

Text book:

- **Moore, T. and Lakha, R. (2006).** "Tolley's Handbook of Disaster and Emergency Management: Principles and Practice", 3rd Edition: Taylor & Francis.
- **Recht, E. (2004). "**Living Through a Natural Disaster". Pearson Education Limited. Essex.
- **Bimal Kanti Paul (2011).**" Environmental Hazards and Disasters: Contexts, Perspectives and Management". Wiely

References:

- **Bennett, S. (2012).** Innovative Thinking in Risk, Crisis, and Disaster Management. Gower, Surrey.
- **Coppola, D. (2011).** Introduction to International Disaster Management. 2nd Edition. Elsevier, BH. London.

On line Resources:

- The United Nations Office for Disaster Risk Reduction: http://www.unisdr.org/
- UNISDR: http://www.preventionweb.net/posthfa/
- Asian Disaster Reduction Centre: http://www.adrc.asia/publication/index.php

Course Description:

The course introduces the students to the field of Disaster and Emergency Management. The course is designed in a way that helps students to develop an understanding of the different phases of a disaster and subsequently be able to develop governmental and corporate policies and strategies required to ensure survival of individuals, societies and organizations.

Course General Objectives:

This course is designed to provide students with a comprehensive understanding of:

— Disaster anatomy and life cycle;
— Escalation of events and vulnerability assessment;
— Principles of crisis and disaster management;
— Disaster management and reduction frameworks, strategies, and actions;
— Differences between natural and man-made disasters;
— Management of man-made and natural disasters;

— International regulations and standards concerning disaster risk reduction;
— Terrorism management.

Intended Learning Outcomes (ILOs)/Competencies:

P) **Knowledge and understanding:**

1. Understand disaster and emergency concepts;
2. Understand the disaster lifecycle;
3. Understand basics of disaster and emergency management;
4. Recognize the various strategies required for managing disasters and emergencies before, during, and after their occurrences.

Q) **Cognitive and intellectual skills (thinking and analysis):**

7. Be able to analyze the different phases of natural and man-made disasters in order to select the most appropriate strategies and actions for reduction and treatment.
8. Be able to perform vulnerability and risk assessment process.

R) **Communication skills (personal and academic):**

1. Be able to create a basic disaster risk reduction plan and to communicate and discuss the structure of this plan amongst other students and colleagues.
2. Be able to create a basic disaster risk reduction plan and to communicate this plan hypothetically between various business units and departments within an organization.

3. Be able to benchmark the disaster risk reduction plan against international standards and best practices of other organizations.

S) **Professional Skills: upon completion of this course:**

1. Students should be able to provide basic advice for real organizations on how to improve their disaster risk reduction practice.
2. Students should be able to provide basic advice for real organizations on how to improve their disaster risk reduction plans.
3. Students should be able to provide basic advice for real organizations on how to benchmark basic practice with best practice of disaster risk reduction according to international standards.

T) **Practical and subject specific skills (Transferable Skills):**

1. Students should be able to apply their knowledge of the DEM process and the different DEM approaches in real organizations from various industry sectors.
2. Students should be able to apply best practice in real organizations.
3. Apply the basic principles of disaster and emergency management in decision making.
4. Apply disaster and emergency management frameworks in real case scenarios.

Intended Learning Outcomes vs Program Outcomes (PO's*):

	PO1	PO2	PO3	PO4	PO5	PO6
A1, B1, C1, D1	**x**					**x**
A2, B2, C2, D1,E1		**x**			**x**	
A3, B2, C2, D1,E1			**x**	**x**		
A3, B2, C2, D1,E2		**x**			**x**	
A3, C3, D2,E3	**x**					**x**

A4, C2, D3,E4	**x**					**x**

*Programs Outcomes (PO's) are available at the academic department.

Teaching Methods:

The course is delivered via **lectures**, classroom **discussions**, **exercises**, and **case studies**. Case studies are aimed at improving students' understanding of the concepts of disasters and emergencies and in order to improve their way of thinking regarding the reduction of impacts of disaster and emergency situations. Students will be divided into groups in order to discuss a specific case study in order to demonstrate their understanding of the content of the course. Course work marks will then be distributed according to their performance in the case studies.

Assessment Instruments

	Mark
Midterm Exam	30%
Quizzes and Participation	10%
Project	20%
Final Exam	40%
Total	100%

Course Policies

University regulations are applied to this course, regarding class attendance; punctuality, exams, late submissions; absence with permission; penalties for cheating; and policies for assignments and projects – if any. Students should be aware of all these regulations in addition to other regulations stated and described in the student's handbook.

Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates
Week 1:	**Unit 1:** Introduction: Basics of Disaster and Emergency Management.	
Week 2:	**Unit 2:** disaster anatomy and life cycle; Escalation of events framework.	
Week 3:	**Unit 3:** Major incident management.	
Week 4:	**Unit 4:** Introduction to Disaster and Emergency planning. Part1	**Classroom discussions**
Week 5:	**Unit 5:** Introduction to Disaster and Emergency planning. Part2: International standards and regulations.	**Classroom Exercises and case studies**
Week 6:	**Unit 6:** Disaster and Emergency Management cycle.	
Week 7:	Midterm exam	
Week 8:	**Unit 7:** Types of disasters, i.e. natural and man-made. Adapting and mitigating Climate change-Disasters	
Week 9:	**Unit 8:** Monitoring disaster and emergency plans.	
Week 10:	**Unit 9:**.Vulnerability assessment and resilience frameworks.	**Classroom Exercises and case studies**
Week 11:	**Unit 10:** Case studies: Analysis of actual disaster scenarios, locally and globally.	
Week 12:	**Second Exam**	

Week 13:	**Unit 11:** Terrorism management. **Part1**	
Week 14:	**Unit 12:** Terrorism management. **Part2**	
Week 15:	**Unit 13:** Revision and class discussions.	**Classroom discussions**
Week 16:	**Final Exam**	

1. Course Specifics

Course Title	Corporate Environmental Management
Course Number:	505321
Course Prerequisite(s)	502101 - 505101
Course Co-requisite(s)	none
Credit Hours	Lecture: 3 CH - Lab: 0 CH
Lecture Days & Time	Tue. & Thu. 10:11:30 AM
Class Location	
Course Instructor/s	Nancy Refai
Syllabus Approved by:	
b. Academic Committee	
a. Department Chair	Dr. Ihab Swalha

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	Office Hours	E-mail Address

Nancy Refai	Lecturer	BA-F 31 05 3294444 Ext. 5410 0788834519	Daily 11:30 -1:00 AM	n.refai@aum.edu.jo

3. Course Components

Resources:

- **Text book:**

1. Jacobsen, J (2011). Sustainable Business and Industry: Designing and Operating for Social and Environmental Responsibility. ASQ Quality Press. Available on knovel application: http://app.knovel.com/web/toc.v/cid:kpSBIDOSE2/viewerType:toc/?

2. SGS (2012). The Route to 14001:2004: Avoiding the Pitfalls. Available online: http://www.sgs.co.uk/~/media/Local/UK/Documents/Brochures/SGS-SSC-ISO%2014001%20Pitfalls%20Booklet-DL-EN-12-V3.pdf

3. Kevin Wilhelm (2013) Return on Sustainability: How Business Can Increase Profitability and Address Climate Change in an Uncertain Economy. Pearson higher education.

- **Additional References:**

1. Andreas, F (2011). A simple path to sustainability: green business strategies for small and medium-sized businesses. ABC-CLIO, LLC. Santa Barbra, California. Available on Google books: http://books.google.jo/books?id=Di45wRgUUJYC&lpg=PP1&pg=PP1#v=onepage&q&f=false

2. Goetsch & Davis (2000) ISO 14000: Environmental Management, 1/E. Prentice hall

3. Barrow, C (2006). Environmental Management for Sustainable Development. 2nd ed. Routledge, New York, USA

4. Beecroft, G. Dennis Duffy, Grace L. Moran, John W. (2003). Executive Guide to Improvement and Change. American Society for Quality (ASQ). Online version available at: http://app.knovel.com/hotlink/toc/id:kpEGIC0006/executive-guide-improvement

5. Beloff, Beth Lines, Marianne Tanzil, Dicksen (2005). Transforming Sustainability Strategy into Action - The Chemical Industry. John Wiley & Sons. Online version available at: http://app.knovel.com/hotlink/toc/id:kpTSSATCI1/transforming-sustainability

6. Christopher J Barrow (1999). Environmental Management: Principles and Practice. London: Routledge. Available on Google books: http://books.google.jo/books?id=Sea4e_Z4vekC&printsec=frontcover#v=onepage&q&f=false

7. Kausek, Joe (2007). Environmental Management Quick and Easy - Creating an Effective ISO 14001 EMS in Half the Time. American Society for Quality (ASQ). Online version available at: http://app.knovel.com/hotlink/toc/id:kpEMQECEI2/environmental-management

8. Schaltegger, S; Burritt, R; Petersen, H (2003). An Introduction to corporate environmental management: striving for sustainability. Sheffield: Greenleaf Publication. Available on Google books: http://books.google.jo/books?id=Sea4e_Z4vekC&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

- **On line Resources:**

1. http://www.epa.gov

2. The issue of population growth and environmental degradation: How Many People Can Live on Planet Earth.
3. http://www.youtube.com/watch?v=dN06tLRE4WE

4. Climate change and environmental responsibility:
5. http://www.epa.gov/climatechange/impacts-adaptation/energy.html

6. Sustainability and sustainable development: Green Economy and Sustainable Development: Bringing Back the Social.
7. http://www.youtube.com/watch?v=O5lBwrJcUOk
8. http://sustainabledevelopment.un.org/resources.html

Course Description:

This foundation course for corporate environmental management, examines the key concepts, theories and principles of environmental management with an aim to equip students with a set of tools and techniques for managing environmental performance in both the context of government and international policies, as well as, corporate strategy.

The course focus on the integration of environmental management systems; ISO 14001, as a tool to enhance efficient environmental management, more to polish the ethical, economic, and scientific principles needed to manage the business sustainability “triple bottom line”: entities that businesses should be both profitable and responsible (socially and environmentally). It is hoped that that this course will enhance the practice of environmental and social responsibility in ways that achieve long term sustainability.

Course General Objectives:

After completion of this course, the student will be able to:

- Explore different definitions of social environmental responsibility, corporate environmental management and sustainability
- Identify key tasks for environmental managers and the difficulties they present
- Increase the awareness of human impact on the environment with main focus on climate change
- Generate principles for environmental management
- Develop and implement a successful business strategy and policy in the domain of environmental and social responsibility, specifically with regards to implementing ISO 14001

Course Intended Learning Outcomes (ILOs)/Competencies:

U) **Knowledge and understanding:**

6- Explain the basic concepts, principles and theories associated with corporate environmental management notion
7- Appreciate and Describe the in-depth variations between different contextual settings, causes, and sources in which environmental risks and impacts may arise.
8- Reflect a basic understanding of ISO14001 elements
9- Explain the elements of ethical and sustainable business; The triple bottom line notion

V) **Cognitive and intellectual skills (thinking and analysis):**

1- Critically analyze the ISO-14001 model for corporate environmental management.
2- Comprehend the implementation of an Environmental Management System in accordance with ISO14001
3- To understand the relationship between an Environmental Management System with the requirements of different stakeholders of the organization
4- Explain how environmental management enhances business success and sustainability.
5- Discuss the impact of effective environmental management in developing business strategies, operations, and compliance status.
6- Demonstrate ability to analyze the organizational activities in a way to identify potential sources and causes of influencing the environment.

W) **Communication skills (personal and academic):**

1- Demonstrate innovative elaboration and debating skills on topics that address issues of concern in corporate environmental management environmental responsibility and sustainability.

2- Exercise corporate environmental management considerations in the development and presentation of basic environmental risk reduction ideas

X) **Professional Skills:**

1- Articulate and explain practical and conceptual issues in relation to solving real-life practical environmental problems taken from a diverse set of case studies
2- Apply the principles of Environmental management in decisions making.
3- Contribute to the achievement of sustainable development, through developing and implementing sustainable strategies and policies
4- Acquire the necessary expertise to contribute in implementing an Environmental Management System (EMS) as specified in ISO14001

Y) **Practical and subject specific skills (Transferable Skills):**

1- Apply the basics of ISO 14001, as well as principles of corporate environmental management in real organizational contexts.
2- Identify the dimensions of corporates environmental impact and develop actions to reduce potential Environmental crisis and disaster risks.

Teaching Methods:

The structure of this course is elaborated throughout sessions of lectures, discussions based on real cases, exercises, reports, homework and projects.

Assessment Instruments

	Mark
Midterm Exam	**30%**
Quizzes and Participation	**10%**
Project	**20%**
Final Exam	**40%**
Total	100%

Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates
Week 1:	• Introduction to environmental management and sustainability • Impact formula	
Week 2:	• Definitions of Sustainability • The Local-Global Three Bottom Lines: ISO 9000, 14000, and 26000	
Week 3:	• Climate Science Primer • population • Changing Conditions	**Classroom Exercises**
Week 4:	• Driving change • Collaboration Formal and Informal • Ethics, rights and Principles of environmental management	**The small islands case study**
Week 5:	• Resilience and Capacity to Prepare and Respond	**Jordan's water crisis**
Week 6:	• Conveying and Reporting on business Mission and Vision of Environmental and Social Responsibility	**Classroom Exercises**
Week 7:	• Social and Environmental responsibility measures	
Week 8:	• Midterm exam	
Week 9:	• Environmental Economics and Policy	**Academic poster presentation and defense**

Week 10:	• The Environmental Management System (EMS) • Background of ISO 14000 and Why It Exists • Decoding ISO 14000	
Week 11:	• Requirements of ISO 14000 • Understanding the business environmental context and defining the environmental aspect • Environmental impact assessment and setting environmental measurements	
Week 12:	• The plan, Do, check, Review circle in ISO implementation	**Case study**
Week 13:	• EMS Documentation	
Week 14:	• Registration and the Audit Process	
Week 15:	• EMS Performance Improvement	
Week 16:	• Final Exam	

Course Policies

University regulations are applied to this course, regarding class attendance; punctuality, exams, late submissions; absence with permission; penalties for cheating; and policies for assignments and projects – if any. Students should be aware of all these regulations in addition to other regulations stated and described in the student's handbook.

General Policies for the Course: students must comply with:

A) Lecture Management

1- Students should behave appropriately during lectures, in order to reflect the good reputation of the university.

2- Students should grasp the course objectives from the first day of attendance in order to work on achieving these objectives through the course duration.

3- Faculty members encourage students constantly to get involved in class discussions. Therefore, students should make use of these discussions in order to enhance their educational experience.
4- Students should not leave classrooms during lectures except for compelling reasons.

B) Scientific Honesty

The university prohibits students from any actions inconsistent with scientific honesty, including cheating in exams whether by giving or receiving information, or submitting assignments done by others. In case of breach of this sort, the student will be subject to an effective university punishment, which he/she should be well aware of.

C) Late Attendance or Absence for Lectures

1- Students attending a lecture more than 10 minutes late will be marked as "late attendant", and every four late attendances will be count for one day absence.
2- Students attending the lecture more than 20 minutes late will be allowed to enter the classroom but will be marked as "absent".
3- If absences exceed 15% of the lectures, then the student will be disqualified from the course, and will get the university zero mark for the course.

D) Absence from exams

1- Absentees from a short test (quiz) will not be allowed for a make-up test.
2- Official excuses for missing any exam must be provided to the lecturer for the appropriate actions to be taken.
3- Special forms designed for absence from final exams are available at the Admission and Registration Department. The Dean of the related course must be provided with these forms by the student within seven days from the date of the missed exam in order to take the appropriate action.
4- Medical excuses must be signed officially and stamped by the Medical Centre.
5- All make up exams will be given only once during the same semester.
6- Make up for the final exam must be held during the first two weeks of the following semester.
7- No excuse will be accepted in case of failing to attend the makeup exam. There will be no other chance for another make up exam.

E) Additional Instructions

1- Cell phones must be turned off during lectures and exams.
2- Students should refer to additional references and do extra reading for the course.
3- Students should submit their assignments within the due time.
4- In case of absence or late registration for the course, the student is fully responsible for the follow up of the missed lecture.
5- Students are advised to keep copies of their assignments as a reference and record.
6- Objection on final exam result is limited to the specific procedures developed by the university. Students have to refer to the Department of Admission and Registration to view relevant details.

1. Course Specifics

Course Title	Principles of Risk Management
Course Number:	0505101
Course Prerequisite(s)	none
Course Co-requisite(s)	505231, 505222, 505232, 505322, 505411, 505422, 505431
Credit Hours	Lecture: 3 CH - Lab: 0 CH
Lecture Days & Time	Mon. - Thu. 8:30-10:00 AM
Class Location	BB-G07
Course Instructor/s	Nancy Refai
Syllabus Approved by:	
b. Academic Committee	
a. Department Chair	Dr. Ihab Swalha

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	Office Hours	E-mail Address
Nancy Refai	Lecturer	BB-F 31 05 3294444 Ext. 5410	Daily 10:00 AM-12 AM	n.refai@aum.edu.jo

3. Course Components

Resources:

- **Text book:**

7. Hopkin, P. (2010). “Fundamentals of Risk Management”. Kogan Page.

- **References:**

8. ISO (2009). “ISO 31000: 2009 Risk management — Principles and guidelines”. International standard. International standardization organization.
9. ISO (2009). “ISO 31010: 2009 Risk management — Risk assessment techniques”. International standard. International standardization organization.
10. Rejda, G. (2011). Principles of Risk Management and Insurance (11th ed.). Prentice Inc.
11. Garlick A (2007). Estimating Risk: A Management Approach. Gower

- **On line Resources:**

3. Institute of Risk Management : http://www.theirm.org/
4. Risk Management Library: http://www.praxiom.com/31000.htm

Course Description:

This introductory course introduce the concepts of risk, risk identification, assessment and evaluation, the need for risk management, the effects of limited risk management application, theory of disaster risk reduction, and introduction to Insurance as one main mean for risk management.

Both business and personal risk are addressed with emphasis on the risk management treatment tools associated with controlling such risks (The risk management 4 T's). Emphasis will be given on the development of basic professional skills (i.e., risk environment analysis, processing risk management, overcoming dangers and organizing investment ideas). Students will be given opportunities to analyze and report risky business situations and to be competent in managing endemic business risk cases. In addition, the course will provide opportunities to practice essential group skills', such as academic discussions, teamwork and debates.

Course General Objectives:

After completion of this course, the student will be able to:

7- Explain theories and views related to risk definitions.
8- Define the fundamental characteristics of risks; types, sources and classifications.
9- Identify the main scope for enterprise risks.
10- Describe the processes, techniques and methods associated with the risk management
11- Critically analyze the ISO-31000 model for risk management.
12- Explore the benefits of risk management processing and the importance of that on safeguarding businesses and communities.
13- Reflect the need of risk management processing on the reducing disasters risks.

Course Intended Learning Outcomes (ILOs)/Competencies:

Z) **Knowledge and understanding:**

6- Demonstrate an understanding of the multidimensional nature and views of risk, and the relevance of its cultural and environmental framework.
7- Appreciate and Describe the in-depth variations between different contextual settings, causes, and sources in which risks may arise.
8- Understand the concepts and principles of Risk management
9- Explain the basic concepts, elements and techniques associated with effective risk management processing with ISO 31000.

10- Understand the basics of crisis and disaster management.

AA) **Cognitive and intellectual skills (thinking and analysis):**

10- Comprehend the application of risk management techniques in treating organizational risks
11- Explain the roots and theories of risk management.
12- Explain how risk management enhances the process of decision making and business success assurance.
13- Discuss the impact of effective risk management in developing business strategies, operations, and compliance status.
14- Demonstrate ability to analyze the organizational environments and identify potential sources and causes of risk.

BB) **Communication skills (personal and academic):**

14. Develop discussion and debating skills in issues related to risk and risk management.
15. Demonstrate innovative elaboration on topics that address issues of concern in the enterprise risk environments.
16. Exercise risk management considerations in the development and presentation of basic risk reduction ideas

CC) **Professional Skills:**

12. Articulate and explain technical and conceptual issues in relation to solving real-life practical problems taken from a diverse set of risk management applications
13. Apply the principles of effective risk management in decisions making.
14. Select, organize and analyze business basic records of which potential risks may be identified.

DD) **Practical and subject specific skills (Transferable Skills):**

11. Apply the basics of ISO 31000, as well as principles of Enterprise Risk Management in real organizational contexts.
12. Understand the disaster formula and what actions that should be made to reduce potential crisis and disaster risks.

Teaching Methods:

The structure of this course is elaborated throughout lectures, classroom debates/discussions, assignments, homework and projects.

Assessment Instruments

	Mark
First Exam	15%
Second Exam	15%
Quizzes, Homework and Participation	10%
Project	10%
Final Exam	50%
Total	100%

Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates
Week 1:	• Basics of understanding risks • Introducing risk management and ISO 31000 • Understanding the business contextual settings in which risks may arise; risks causes and sources.	
Week 2:	• Risk identification: process and techniques •	
Week 3:	• Risk description • Risk estimation: techniques and methodologies	**Classroom Exercises**

Week 4:	• Risk evaluation in relation to organizational capacity, level of tolerance and appetite	
Week 5:	• Risk reporting, Decision making • Risk treatment	
Week 6:	**Second Exam**	**Classroom Exercises**
Week 7:	• Risk monitoring and residual risk evaluation • Fundamentals of Insurance	
Week 8:	• Benefits of risk management • Risk management in disaster reduction management.	
Week 9:	**Final Exam**	**Academic poster presentation and defense**

Course Policies

University regulations are applied to this course, regarding class attendance; punctuality, exams, late submissions; absence with permission; penalties for cheating; and policies for assignments and projects – if any. Students should be aware of all these regulations in addition to other regulations stated and described in the student's handbook.

General Policies for the Course: students must comply with:

A) Lecture Management

1- Students should behave appropriately during lectures, in order to reflect the good reputation of the university.
2- Students should grasp the course objectives from the first day of attendance in order to work on achieving these objectives through the course duration.
3- Faculty members encourage students constantly to get involved in class discussions. Therefore, students should make use of these discussions in order to enhance their educational experience.

4- Students should not leave classrooms during lectures except for compelling reasons.

B) Scientific Honesty

The university prohibits students from any actions inconsistent with scientific honesty, including cheating in exams whether by giving or receiving information, or submitting assignments done by others. In case of breach of this sort, the student will be subject to an effective university punishment, which he/she should be well aware of.

C) Late Attendance or Absence for Lectures

1- Students attending a lecture more than 10 minutes late will be marked as "late attendant", and every four late attendances will be count for one day absence.
2- Students attending the lecture more than 20 minutes late will be allowed to enter the classroom but will be marked as "absent".
3- If absences exceed 15% of the lectures, then the student will be disqualified from the course, and will get the university zero mark for the course.

D) Absence from exams

1- Absentees from a short test (quiz) will not be allowed for a make-up test.
2- Official excuses for missing any exam must be provided to the lecturer for the appropriate actions to be taken.
3- Special forms designed for absence from final exams are available at the Admission and Registration Department. The Dean of the related course must be provided with these forms by the student within seven days from the date of the missed exam in order to take the appropriate action.
4- Medical excuses must be signed officially and stamped by the Medical Centre.
5- All make up exams will be given only once during the same semester.
6- Make up for the final exam must be held during the first two weeks of the following semester.
7- No excuse will be accepted in case of failing to attend the makeup exam. There will be no other chance for another make up exam.

E) Additional Instructions

1- Cell phones must be turned off during lectures and exams.
2- Students should refer to additional references and do extra reading for the course.
3- Students should submit their assignments within the due time.
4- In case of absence or late registration for the course, the student is fully responsible for the follow up of the missed lecture.
5- Students are advised to keep copies of their assignments as a reference and record.
6- Objection on final exam result is limited to the specific procedures developed by the university. Students have to refer to the Department of Admission and Registration to view relevant details.

1. Course Specifics

Course Title	General Physics (1)
Course Number:	904101
Course Prerequisite(s)	None
Course Co-requisite(s)	None
Credit Hours	Lecture: 3 CH - Lab: 0 CH
Course Instructor/s	Dr. Hayel Shehadeh

2. Course Components

Resources:

- **Text book:**

Jewett.J.w and Serway. R. A. (2010). Physics for Scientists and Engineers with Modern Physics. **8th edition.Brooks/Cole Pub Co.**

- **References:**

12. Halliday, Resnick and Walker.(2010), Fundamental of Physics,Edition, 9th .Wiley
13. Young and Freeman, (2010). University Physics with modern physics with mastering physics.Edition.13th .Addison-Wesley.
14. Wilson. Jerry, Buffa Anthony. J. and Bo Lou.(2009). College Physics with Mastering Physics, Edition 7th . Addison-Wesley.
15. Giancoli,(2008).Physics for scientists and Engineers with modern Physics and Mastering physics, Edition 4th . PearsonEdu, Inc.
16. F. W. Taylor, Elementary Climate Physics, Oxford University Press, 2005.

- **On line Resources:**

5. www.cengage.com/physics/serway

Course Description:

This course is a first year calculus-based physics course, for scientist an engineers. This course covers the basic principles of classical mechanics; Introduction to the principles of mechanics, energy, heat, sound and properties of matter following, The emphasis in this course will be on helping you to develop an understanding of natural phenomena through your own direct observations and reasoning. Learning based only on what you can infer and reason from direct observations is not easy and can be quite frustrating at times. These moments of frustration are usually where the seeds of understanding are planted.

This course will present a short overview of the climate history of our planet as indicated by modern techniques of climate recording and focuses on the description and analysis of the underlying physical and chemical processes that define the earth climate. We will seek to lay down the fundamental scientific principles behind climate change, global warming and issues involving climate change impacts and the issue of *mitigatio*n -- that is, basic solutions to dealing with the challenges presented by climate change. The processes leading to the balance in the earth climate system are fundamental physical processes driven by the laws of thermodynamics, convective hydrodynamics, and radiative transfer which will be discussed in details in this course.

Course General Objectives:

After completion of this course, the student will be able to:

1. Explain theories related to physics principles and the Earth's climate system and its components.
2. Define the fundamental concepts of physics and communicate his ideas clearly.
3. Describe the challenges and issues related to the use of physics in technology.
4. Distinguish the factors governing natural climate variability from human-caused climate change.
5. Identify strategies to address the greenhouse effect.
6. Describe the benefits of studying physics for future career options.
7. Ability to analyze scientific data and presenting them in seminars.
8. Explore cross-cultural ethical issues and environmental issues.
9. Explore cross-cultural ethical issues and environmental issues

Course Intended Learning Outcomes (ILOs)/Competencies:

EE) **Knowledge and understanding:**

14- Ability to develop a clear understanding of basic concepts in classical mechanics and earth climate
15- To form a good background for follow up courses in physics, engineering and environment.
16- To develop the skills to deal with the physical concepts quantitatively.
17- To develop mathematical ability to manipulate formulae and derive correct numerical solutions that can be measured in real world.
18- To develop the learning skills of the student in using computers and internet resources while using them as educational tools, problem solving methods and demonstration tools.
19- To enhance the student self-learning ability.

FF) **Cognitive and intellectual skills (thinking and analysis):**

1- Ability to think about the physics concept in application
2- Appreciate physics principles and the importance of studying physics
3- Explore new ideas using existing theories.
4- Analyze and communicate ideas of physics used in devices and technology.

GG) **Communication skills (personal and academic):**

17. Develop and apply communication skills that improve competence in scientific meetings
18. Become creative by elaborating on scientific topics that address issues of concern in the workplace.
19. Exercise ethical considerations in the development and presentation of ideas.
20. Adapt ideas to listeners' attitudes, values and beliefs.
21. Conduct library research, and other information-gathering activities.
22. Participate actively in classroom debate, assignments and brain storming sessions.

HH)**Professional Skills:**

15. Collaborate with small group team members to study and solve problems in physics.
16. Participate effectively in classroom and brain storming sessions.
17. Demonstrate skills in communicating physics ideas and concepts.

II) **Practical and subject specific skills (Transferable Skills):**

13. Communication skills, covering both written and oral communications.
14. Problem-solving skills, relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information.
15. Study skills needed for continuing professional development.
16. Apply creative and critical thinking skills in carrying out studies.
17. Interpersonal skills, relating to the ability to interact with other people and to engage in team-working.
18. Time-management and organizational skills, as evidenced by the ability to plan and implement efficient and effective modes of working.

Teaching Methods:

The structure of this course is elaborated throughout lectures, classroom debates, assignments, exercises, homework and projects.Add text here

Assessment Instruments

	Mark
First Exam	15%
Second Exam	15%
Quizzes, Homework and Participation	10%
Project	10%
Final Exam	50%
Total	100%

CourseAcademic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates
Week 1:	Chapter1: Mechanics (Physics and Measurements)	7,9,11 and 15.
Week 2:	Chapter2: Motion in one dimension	1,3,6,13,17,21,33,37,38, 43 and 45.
Week 3:	Chapter3: Vectors	1, 4,11,16,20,29,31,41 and 53.
Week 4:	Chapter4: Motion in two dimensions	1,2,5,8,14,23,27 and 33
Week 5:	Chapter5: The Laws of Motion (Newton's Laws)	1,3,9,14,15,21,24,28,31, 36,37 and 52.
Week 6:	Chapter5 continued &Exam 1 (chapters 1-5)	
Week 7:	Chapter6: Circular Motion Chapter7: Energy of a system	1,5,8,11,and 17.p.158 1,4,9,11,14,15,18,25,31, 33,35 and 40.
Week 8:	Energy of a system continued	2,5,7,14,19,22,29,37 and

	Chapter8: Conservation of energy	**53.**
Week 9:	**Conservation of energy continued Chapter9: Linear Momentum and Collisions**	**1,4,11,15,19,25,35,37 and 40.**
Week 10:	**Linear Momentum and Collisions continued**	
Week 11:	**Chapter19: Temperature and Zeroth law of thermodynamics**	**2, 4, 12, 29, 61, and 68.**
Week 12:	**Ch. 20: The First Law of Thermodynamics.**	**4, 8, 18, 30, 44, and 58.**
Week 13:	**Chapter22: Heat Engines, Entropy and the Second Law of Thermodynamics.**	**1, 8, 14, 20, 28, 35, 48, 54, and 76.**
Week 14:	**Ch. 13: Universal Graviation.**	**2, 8, 12, 14, 20, 30, 38 nad 50**
Week 15:	**Revision Week**	
Week 16:	**Final Exam**	

Course Policies

University regulations are applied to this course, regarding class attendance; punctuality, exams, late submissions; absence with permission; penalties for cheating; and policies for assignments and projects – if any. Students should be aware of all those in addition to other rules and regulations stated and described in the student's handbook.

Course Modulus:
This course consists of 3 modulus units: Mechanics, Energy Conservation & Thermodynamics.

Course	**Curriculum and Hypermedia**
Module 1	Mechanics

Key Concepts	Units, One and Two Dimensional Motions, Newton's Laws of Motion and Kinematics and Dynamics.
Overview	Defining fundamental concepts in physics and related to our everyday events'. Use of physics in the new technology and its implementation. Explore new ideas related to physics application.
Aim	Apply theories to experiments and elaborate on their applications.
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss the different types of functions and units • Discuss how technology can contribute to curriculum change • To form a good background for follow up courses in physics, engineering and environment. • To develop the skills to deal with the physical concepts quantitatively. • To develop mathematical ability to manipulate formulae and derive correct numerical solutions that can be measured in real world.
Units	**Chapter1: Mechanics (Physics and Measurements)** **Chapter2: Motion in one dimension** **Chapter3: Vectors** **Chapter4: Motion in two dimensions** **Chapter5: The Laws of Motion (Newton's Laws)**
Activity	**Homework assignment for each chapter and quizzes.** **Do short research projects related to the ideas discussed in the units.**
Module 2	Conservation of Energy
Key Concepts	Work, Energy, Isolated and Non-Isolated Systems and Concept of Conservation of Energy.
Overview	Defining the difference between isolated and non-isolated system in terms of

	conservative and non-conservative forces.
Aim	Relating work and energy to the forces applied to the system. Defining mechanical energy (kinetic and potential) and analyzing physical situations in terms of the mechanical energy. Utilize bar chart to and work-energy relation to analyze physical situations. Conduct energy analysis.
Learning Outcomes	At the end of this module learners will be able to: • Defining work and energy and their corresponding units. • Distinguish between work and power. • Defining kinetic and potential energies in physical situations. • Predicting object's mechanical energy. • Applying the principles of energy conservations for variety of physical situations. • Distinction between energy conservation and non-conservation.
Units	**Chapter7: Energy of a system** **Chapter8: Conservation of energy** **Chapter9: Linear Momentum and Collisions**
Activity	**Homework assignment for each chapter and quizzes.** **Do short research projects related to the ideas discussed in the units.**
Module 3	Heat and Thermodynamics
Key Concepts	Temperature, Heat, Entropy, Zeroth, First, Second and Third Laws of Thermodynamics.
Overview	One misconception about the threat of climate change is that it has to do with the absolute warmth of the Earth. In instead, it is the *rate **of change*** that has scientists concerned about. Living things, including humans, can easily adapt to substantial changes in climate as long as the changes take place slowly, over many thousands of years or longer. However, adapting

	to changes that are taking place on timescales of *decades* is far more challenging.The laws of physics driven by the laws of thermodynamics, convective hydrodynamics, and radiative transfer describe climate change system and global warming. This course will focus on the description and analysis of the underlying physical and chemical processes that define the earth climate. The course also seeks to lay down the fundamental scientific principles behind climate change, global warming and issues involving climate change impacts and the issue of *mitigatio*n -- that is, solutions to dealing with the challenges presented by climate change.
Aim	This module aims to lay down the fundamental scientific principles behind climate change, global warming and issues involving climate change impacts and the issue of *mitigatio*n -- that is, solutions to dealing with the challenges presented by climate change in the areas of the physical and biological sciences.
Learning Outcomes	At the end of this module learners will be able to: • Analyze variety of environmental issues • Human interactions in environment. • Becoming more environmentally literate. • Identify and describe the basic scientific principles and processes important in climate change. • Describe the effect of greenhouse gases and temperature. • Describe the effect of clouds on temperature. • Expalin why greenhouse gases affect temperature.
Units	**Chapter19: Temperature and Zeroth law of thermodynamics** **Chapter. 20: The First Law of Thermodynamics.** **Chapter22: Heat Engines, Entropy and the Second Law of Thermodynamics.**
Activity	**Overview**

Homework assignment for each chapter and quizzes.
Do short research projects related to the ideas discussed in the units.

1. Course Specifics

Course Title	**Ecology**
Course Number:	**201415**
Course Prerequisite(s)	**201311**
Course Co-requisite(s)	**-**
Credit Hours	**Lecture: 3 CH - (Lab: 1 CH -see 201416)**
Lecture Days & Time	
Class Location	
Course Instructor/s	**Prof. Fares Khoury**
Syllabus Approved by:	
b. Academic Committee	
a. Department Chair	

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	Office Hours	E-mail Address
Prof Fares Khoury	Professor	SB-G37		f.khoury@aum.edu.jo

3. Course Components

Resources:

- **Text book:**

Elements of Ecology. 7th or later edition; by T. Smith and R. Smith. Pearson.

- **References:** to be provided by the instructor

Course Description:

Ecology has advanced considerably as a science in recent years due to the growth of the environmental movement and the adverse anthropogenic imapcts on the climate and environment. Ecology is a scientific discipline, although the word *ecology* is often misused in the media and confusd by some with *environment* and *environmentalism*. This course introduces ecology as an inter-disciplinary, dynamic and contemporary discipline with an actual relevance to real world problems affecting all living organisms including humans. It covers the fundamental relationships of living organisms with their environment and introduces essential ecological concepts. The structure and dynamics of populations and communities, and ecosystem function will be introduced and related to various applications and environmental issues. The course includes both lectures and active learning. The students can select case studies or special topics which they will discuss and demonstrate as presentations. The theoretical course is concurrent with the ecology lab course (201416) where the students acuire basic skills in lab and field work.

. **Course Objectives:**

This course aims to 1) introduce the various relationships between organisms and their living and non-living environment, 2) raise awareness of the importance of the science of ecology and about the influence of human activities on the environment, and 3) provide the students the opportunity to critically evaluate and discuss case studies and current debates

Course Outcomes:

After completion of this course, the student will be able to:

10. Explain key concepts and themes in ecology
11. Describe and examine the basic features and dynamics of populations, communities and ecosystems
12. Compare and contrast various terrestrial and aquatic ecosystems
13. Describe interspecific interactions including their benefits to human well-being
14. Investigate the specific interactions between humans and their environment and use an interdisciplinary approach in demonstrating these interactions

15. Demonstrate awareness about the influence of human activity on the biosphere, and the impacts of climate change on ecosystems

Teaching Methods:

The structure of this course is elaborated throughout lectures, classroom discussions and debates, small projects or assignments. The theoretical part is closely related to and harmonized with the lab course (201312).

Assessment Instruments

	Mark
First Exam	15%
Second Exam	15%
Quizzes, Homework and Participation	10%
Project	10%
Final Exam	50%
Total	100%

Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates
Week 1	Ch. 1: The Nature of Ecology	
Week 2	Ch. 2: Climate	
Week 3	Ch. 3-4: Aquatic and terrestrial environments	
Week 4	Ch. 5: Ecological Genetics, adaptations	***Discussion session***
Week 5	Ch. 6-7: Plant and animal adaptations	
Week 6		**First Exam**
Week 6	Ch. 8: Life History patterns	
Week 7	Ch. 9-10: Population properties and growth	
Week 8	Ch. 11 Intraspecific population regulation	
Week 9	Ch. 12: Metapopulations	
Week 10:	Ch. 13-15: Species interactions	
Week 11:	Ch. 16-17: Community structure; what influences community structure?	
Week 12:		**Second Exam**
Week 12	Ch. 18-19: Community dynamics; Landscape ecology	
Week 13:	Ch. 20: Ecosystem energetics	
Week 14:	Ch. 21-22 Nutrient cycling	
Week 15	Ch. 29 Global climate change	***Discussion session; Submission of projects***

		(reports/presentations)
Week 16:	**Final Exam**	

Course Policies
University regulations apply to this course regarding class attendance, punctuality, exams, late submissions, absence with permission, penalties for cheating, and policies for assignments and projects, if any. Students should be aware of all those in addition to other rules and regulations stated and descried in the student handbook.

Course modules

Course	**Ecology**
Module 1	**The Physical Environment**
Key Concepts	Climate, spatial and temporal variations, microclimates
Overview	Ecology is linked to the physical sciences by the concept of habitability, i.e. the capacity of the environment to support life. The understanding of the ecology of organisms depends much on the understanding of the physical environment. Interactions between organisms and the physical environment which span over a period of several generations are the driving force of natural selection leading to adaptations. Short-term interactions between individuals and the environment have a direct influence on physiological performance, survival, growth and reproduction.

	Many organisms also have to cope with short-term variation in their environment. This unit describes features of the physical environment which influence habitability in terrestrial and aquatic ecosystems. Spatial and temporal variation in climate, its causes and consequences will also be introduced.
Aim	Students will learn about the features of the physical environment which influence habitability.
Learning Outcomes	At the end of this module, students will be able to - describe the determinants of climate - discuss the causes for spatial and temporal variation in climate and features of the physical environment - compare the physical environment of aquatic and terrestrial ecosystems
Units	1- Climate 2- The Aquatic Environment 3- The Terrestrial Environment
Readings	- Smith, T., Smith, R (2009): Elements of Ecology. 6th (or later) edition. Benjamin Cumming/Pearson. (chapters 1-4). - www.myecologyplace.com
Activity	- review
Module 2	**The Organism and its Environment**
Key Concepts	Natural Selection, Hardy-Weinberg Equation, adaptation, species distribution, life history
Overview	Every species has a specific geographic distribution. Some species are able to survive and thrive in extreme environments, e.g. deserts. The fundamental questions are, what controls the distribution and abundance of species? what enables a species to succeed in one environment but not another ? A species which has adaptations to a set of features in one environment preclude it to survive in another. Adaptations are physiological, morphological, and behavioral and life-style characteristics. These enable the organism to acquire and assimilate energy and matter, reproduce and

	respond to external stimuli in its environment. Autotrophs (e.g. plants) and heterotrophs differ considerably in the way energy is acquired, and their adaptations are discussed in two different chapters. The module starts with the basics of evolution of adaptations by means of natural selection.
Aim	Students will be able to improve their knowledge about natural selection and how it produces adaptations. Plants and animals differ in many ways, for example how they acquire energy. The adaptations of each group will be discussed, always taking into consideration constraints / trade-offs
Learning Outcomes	At the end of this module, students will be able to - describe the hierarchical levels of ecological study: organisms, populations, communities, ecosystems - define adaptation and discuss the role of natural selection - discuss the various physiological, morphological and behavioral adaptations of plants and animals to their environments - demonstrate that various life history patterns of growth, development and reproduction are adaptations to the environment
Units	2- Ecological Genetics: Adaptations and Natural Selection 3- Plant Adaptation to the Environment 4- Animal Adaptations to the Environment 5- Life History Patterns
Readings	- Smith, T., Smith, R (2009): Elements of Ecology. 6th (or later) edition. Benjamin Cumming/Pearson. (chapters 5-8). - www.myecologyplace.com
Activity	review
Module 3	**Populations**
Key Concepts	Population structure, population growth, logistic and exponential growth, intra-specific competition, meta-populations

Overview	A population is a group of individuals of the same species which live in the same area at the same time. Reproduction and death of individuals affect population dynamics through time. These events are affected by various environmental and behavioral factors. Immigration/Emigration affects population dynamics, and is also an important interaction between local sub-populations which form large regional meta-populations.
Aim	Students' knowledge about population properties and dynamics will be enhanced.
Learning Outcomes	At the end of this module, students are expected to - define a population and its properties - describe the types of population growth using models - discuss the various factors, both intrinsic and extrinsic, which affect birth and death rates - explain the effect of competition among the individuals of the same population - describe interactions among local sub-populations and present awareness about the importance of the meta-population concept in conservation
Units	1- Properties of Population 2- Population growth 3- Intraspecific Population Regulation 4- Metapopulations
Readings	- Smith, T., Smith, R (2009): Elements of Ecology. 6th (or later) edition. Benjamin Cumming/Pearson. (chapters 9-12). - www.myecologyplace.com
Activity	review discussion session initiating project work
Module 4	**Species Interactions**

Key Concepts	Lodtka-Volterra models, inter-specific competition, Resource and non-resource factors, Ecological niche, competitive exclusion, character displacement, resource partitioning, predation, optimal foraging theory, predator defences, mimicry, parasitism, mutualism, co-evolution
Overview	The population dynamics of each species is also affected by interactions with other species. These interactions include interspecific copmpetition, predation, parasitism, and mutualism. Some of these interactions have a profound effect on human well-being (e.g. pollination). Deeper knowledge about these interactions is crucial in managing many issues, e.g. pest control, assessing the effects of and controlling invasive species, and conserving biological diversity.
Aim	Students will be able to acquire a deeper knowledge about the nature of species interactions and how these vary and affect the populations of each species.
Learning Outcomes	At the end of this module, students will be able to - describe the various species interactions and present examples for each type of interaction and related adaptations - discuss the consequences of interspecific interactions and predation on population dynamics using current models - discuss the various theories and principles associated with the species interactions - demonstrate awareness about the possible consequences of species introductions and bio-invasions
Units	1- Interspecific Competition 2- Predation 3- Parasitism and mutualism
Readings	- Smith, T., Smith, R (2009): Elements of Ecology. 6th (or later) edition. Benjamin Cumming/Pearson. (chapters 13-15). - www.myecologyplace.com - Howe, H, Westley, L (1990): Ecological Relationships of Plants and Animals. Oxford UP.
Activity	**Review**

Module 5	**Community Ecology**
Key Concepts	Community structure, biodiversity, food webs, keystone species, stress and resource availability, succession, edge effect, theory of island biogeography
Overview	The ecological community is defined as the set of plant and animal species that occupy an area. Some species in a community are abundant while others are rare, and some communities have many species while others have very few. The study of these properties and their causes including various interactions between species and their living and non-living environment are among the subjects of this module. The effect of habitat area on species diversity will also be discussed. Community structure changes with time, leading to ecological succession, and communities vary spatially due to variation in climate, geology, soils, disturbances, biotic factors etc.., leading to typical zonation patterns and mosaics of communities on the broader landscape.
Aim	Students will be able to understand the complex web of interactions within the community, and the factors that influence community structure and its temporal and spatial variation.
Learning Outcomes	At the end of this module, students will be able to - define the community and its structure - calculate various diversity indices - describe the factors which affect community structure and the change of community structure in time and space - explain the importance of habitat area and the interactions among habitat patches for species diversity - demonstrate awareness about impacts of man-made disturbances and

	habitat areas and their spatial arrangement at the landscape level on biodiversity
Units	1- Community structure 2- Factors influencing the structure of communities 3- community dynamics 4- landscape ecology
Readings	- Smith, T., Smith, R (2009): Elements of Ecology. 6th (or later) edition. Benjamin Cumming/Pearson. (chapters 16-19). - www.myecologyplace.com
Activity	**review**
Module 6	**Ecosystem Ecology**
Key Concepts	Energy flow, primary and secondary production, ecological efficiencies, energy pyramids, nutrient cycles, decomposition
Overview	The ecosystem concept combines the physical (abiotic) and biological (biotic) components into a single interactive system. It provides a framework to integrate the student's accumulated understanding of adaptation populations, communities, and the abiotic environment. Ecosystem ecology uses a functional approach in describing the role of species or species group in terms of energy and material processing. The community is generally partitioned into autotrophs, or primary producers, and heterotrophs, or secondary producers. The driving force of ecosystems is ultimately the sun and most ecosystems are open, exchanging organic matter and nutrients with other ecosystems.
Aim	The overriding aim of this module is to integrate previously acquired knowledge and enhance understanding of energy flow and nutrient cycling in ecosystems.
Learning	At the end of this module, students will be able to

Outcomes	- define ecosystems and describe the flow of energy and nutrient cycling in ecosystems - discuss the importance of key processes, such as photosynthesis and decomposition, in energy flow and nutrient cycling - Describe the biogeochemical cycles of nutrients (carbon, nitrogen, phosphorus etc.)
Units	1- Ecosystem Energetics 2- Decomposition and nutrient cycling 3- biogeochemical cycles
Readings	- Smith, T., Smith, R (2009): Elements of Ecology. 6th (or later) edition. Benjamin Cumming/Pearson. (chapters 20-22). - www.myecologyplace.com
Activity	- review - submit a summary of project
Module 7	**Human Ecology: Global Climate Change**
Key Concepts	Climate change
Overview	No other organism has affected Earth's environment as much as the human species. Our relationship with the environment is constantly re-defined, it is a relationship based largely on energy. The changes humans have brought about are mainly due to meeting the basic needs of a growing human population. We are now beginning to understand the consequences of our past and current activities. In this module the potential of human activity to significantly change Earth's climate will be discussed.
Aim	Students will be able to understand human impacts on the environment, especially the potential for human activities to significantly change global climate.
Learning Outcomes	At the end of this module, students will be able to - explain the role of greenhouse gases and the consequences of rising CO2 in the

	atmosphere - discuss the effects of climate change on ecosystems, coastal environments, agricultural production, and human health
Units	1- Global Climate change
Readings	- Smith, T., Smith, R (2009): Elements of Ecology. 6th (or later) edition. Benjamin Cumming/Pearson. (chapter 29). - www.myecologyplace.com - Atkinson, P. (ed.) (2010): Vector Biology, Ecology and Control. Springer (this and other relevant books are available at AUM library as e-books)
Activity	- review - group discussions and presentations

1. Course Specifics

Course Title	**Applied Ecology**
Course Number:	**201416**
Course Prerequisite(s)	**201415**
Course Co-requisite(s)	**201415**
Credit Hours	**Lecture**
Lecture Days & Time	
Class Location	
Course Instructor/s	**Dr Fares Khoury**
Syllabus Approved by:	

b. Academic Committee
a. Department Chair

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	Office Hours	E-mail Address
Dr Fares Khoury	Professor	SB-G37		f.khoury@aum.edu.jo

3. Course Components

Resources:

- **Text book:** Primack, R. (2012) A primer of Conservation Biology. 5th edition. Sinauer Associates

Course Description:

Sustainability has become an important concept in resource management and development. Understanding and mimicking natural processes is the best way to preserve natural resources and avoid the adverse consequences of human activities including biodiversity loss. Deep understanding of the basic ecological concepts and interactions can thus help us solve actual problems threatening human well-being. This course introduces a sample of various applications based on ecological knowledge. The concepts of sustained yield, sustainable agriculture, forestry and fishery, and the importance of species interactions, e.g. in weed and pest control. The principles of conservation biology will be introduced and discussed, including biodiversity, ecosystem functions, and population viability and means of minimizing the threats to biodiversity. Case studies in restoration ecology will be demonstrated and will include phyto- and bioremediation. The influence of climate change on the spread of infectious diseases and their arthropod vectors will be one of the issues discussed during the course. This course will include lectures to introduce the various themes and demonstrate case studies, in addition to group discussions and presentations as part of projects carried out by the students. Students will also be encouraged to engage in discussions with professionals in the environmental and agricultural sectors during sessions with invited guests.

Course Objectives:

This course aims to educate students 1) about the importance of understanding population dynamics and ecosystem function as a base for estimating sustained yield and for sustainable use of resources, 2) how to avoid or reduce adverse anthropogenic impacts in natural ecosystems and other problems arising in rural and urban ecosystems; 3) in the integration of basic ecological concepts as a base for concerving biological diversity.

Course Outcomes:

After completion of this course, the student will be able to:

16. Explain and demonstrate the impacts of human population growth and unsustainable use of resources on climate, ecosystems and biodiversity
17. Realize that ecosystem services and biodiversity are extremely valuable
18. Describe sustained yield and sustainable use of natural resources
19. Describe the different levels of biodiversity and threats to biodiversity
20. Recognize population – level considerations related to population vialbility
21. Recommend and design possible solutions to various environmental problems in urban, rural and natural environments by intergrating knowledge about ecosytem and community processes and species interactions

Teaching Methods:

The structure of this course is elaborated throughout lectures, classroom discussions and debates, small projects or assignments.

Assessment Instruments

	Mark
First Exam	15%
Second Exam	15%
Quizzes, Homework and Participation	10%
Project	10%
Final Exam	50%

Total 100%

Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates
Week 1	Introduction The sustainable use of natural resources: Human population growth	
Week 2	The sustainable use of natural resources: ecosystems, sustained yield	
Week 3	Species interactions: competition, parasitism and predation: herbivory, weeds and bio-invasion	
Week 4	Species interactions: prey-predator interactions and biological	**Discussion session**

	control; mutualism and the role of pollination	
Week 5	The ecology of disease vectors, and possible impacts of climate change on the spread of infectious diseases	**Submission of student project proposals**
Week 6	Introducing Conservation Biology	**First Exam**
Week 7-8	What is biodiversity	
Week 9	Values and ethics in conservation biology	
Week 10	Threats to biodiversity	
Week 11	Species extinctions, genetics and demographic processes	
Week 12:	Community and ecosystem – level considerations	**Second exam**
Week 13:	Conserving Populations and Species	**Discussion session**
Week 14:	Protected Areas	**Discussion session**
Week 15	Ecosystem management and ecological restoration; phyto- and bioremediation	***Submission of projects (reports/presentations)***
Week 16:	**Final Exam**	

Course Policies
University regulations apply to this course regarding class attendance, punctuality, exams, late submissions, absence with permission, penalties for cheating, and policies for assignments and projects, if any. Students should be aware of all those in addition to other rules and regulations stated and descried in the student handbook.

Course modules

Course	Applied Ecology
Module 1	**Sustainable use of resources**
Key Concepts	Environmental sustainability, natural capital and ecosystem services, sustainable yield
Overview	The growing human population and the desire for expanded economic growth within the world community have brought the issue of sustainability to the forefront of current economic, political and environmental discussions. In this module Environmental sustainability which focusses on natural capital will be discussed. We will examine the basic environmental issues related to human activities of resource management and extraction and consider how these issues relate to the ecological processes and patterns discussed during the basic ecology course.
Aim	Students will learn about the sustainable use of natural resources
Learning Outcomes	At the end of this module, students will be able to - describe the consequences of human growth on natural capital - define environmental sustainability - explain the concept of sustainable yield based on population growth models
Units	4- Human population growth 5- Sustained yield
Readings	- Krebs, C. (2009): Ecology. Benjamin Cumming/Pearson - Smith, T., Smith, R (2009): Elements of Ecology. 6th (or later) edition. Benjamin Cumming/Pearson. (chapter 27). - www.myecologyplace.com
Activity	- Review

Module 2	The role of species interactions
Key Concepts	Weed control, pests (parasite ecology), biological pest control, prey-predator interactions, herbivory, bio-invasions, mutualism, pollination
Overview	The study of various interspecific interactions provides the foundation for managing resources. Weeds often compete with crop plants, but the impact of weeds can be better controlled if the interaction and the factors which provide competitive advantage to the weeds are well understood. The populations of pests in agro-ecosystems can be managed by suitable design and predators of these pests, thus decreasing the need for harmful chemical pesticides. The interaction between herbivores and plants is important in managing range lands, and many of our crops would not be possible without the help of insect pollinators.
Aim	Students will be able to deepen their knowledge about the role of various interspecific interactions, and means of using the organisms for human benefit
Learning Outcomes	At the end of this module, students will be able to - analyse the basic interspecific interactions and associated models - describe the role and benefits of species interactions in agro-ecosystems and other systems
Units	6- Competition, weeds, bio-invasions 7- Herbivory and predation: their roles in range management and biological control 8- The role of pollination
Readings	- Howe, H, Westley, L (1990): Ecological Relationships of Plants and Animals. Oxford UP. - Vandermeer, J. (2011): The Ecology of Agroecosystems. Jones and Bartlett. - Smith, T., Smith, R (2009): Elements of Ecology. 6th (or later) edition. Benjamin Cumming/Pearson. (chapters 13-15). - www.myecologyplace.com -
Activity	- Review - Group discussion

Module 3	**Climate change and Human Health**
Key Concepts	Climate change, disease vectors, conservation medicine
Overview	Climate variability has been shown to have an impact on the temporal and spatial distribution of infectious diseases. Climatic changes can directly or indirectly affect the populations of arthropod disease vectors, e.g. those carrying malaria or dengue fever. In this module, reviews and case studies will be discussed. The module will also include a demonstration of research carried out at AUM on mosquitoes and migratory birds.
Aim	Students will learn about the biology of disease vectors and factors affecting their distribution and abundance
Learning Outcomes	At the end of this module, students will able to - Define disease vectors and provide examples of wide-spread infectious diseases and their vectors - discuss the various factors which affects distribution and abundance of some arthropod vectors - realize the importance of understanding the ecology of vectors in assessing spread of vectors and controlling their populations
Units	5- Ecology of disease vectors
Readings	- Atkinson, P. (2010) Vector Biology, Ecology and Control. Springer. - Ecology of parasite-vector interactions - Takken, W., Koenraadt, C. (2013) Ecology of parasite vector Interactions; Ecology and control of vector-borne diseases, Volume 3. WAP. - Mehlhorn, H. (2012) Arthropods as vectors of emerging disease. Parasitology research Monographs, Vol. 3. Springer. - Becker, N. et al. (2010) Mosquitoes and their control. 3rd edition. Springer. -
Activity	Review discussion session initiating project work / submission of proposals

Module 4	Conservation Biology
Key Concepts	Biological diversity, genetic diversity, species, environmental ethics, value of ecosystem services, threats to biodiversity (habitat destruction, climate change, invasive species, etc…), population viability, protected areas
Overview	Earth is currently undergoing a mass extinction due to human activities. Interest in protecting the world's biological diversity – including its amazing range of species, its complex, biological communities and ecosystem processes, and the genetic variation within species – has intensified during the last few decades. Conservation biology is an integrated, multidisciplinary scientific field that has developed in response to the challenges of preserving species and ecosystems. Its goals is a) it document the full range of biological diversity, b) to investigate the impacts of human activities on species, genetic variation and ecosystems, and c) to develop practical approaches to prevent the extinction of species, maintain genetic diversity, and protect and restore biological communities and their associated ecosystem functions. In this module, basic concepts are introduced first, then threats are identified and means of preventing biodiversity loss are discussed.
Aim	Students will investigate the human impact on species, genetic variation and ecosystems, and learn about practical approaches to prevent the extinction of species, maintain genetic diversity, and protect and restore biological communities and their associated ecosystem functions
Learning Outcomes	At the end of this module, students will be able to - Define biological diversity at different levels (species, genetic…) - Realize that biodiversity is extremely valuable - Discuss and compare various ethical arguments supporting preservation - discuss the consequences of human activities (including climate change) on genetic diversity, habitats and their associated communities and ecosystem functions - identify relevant ecological concepts which can be integrated in the

	development of approaches for conserving biological diversity
Units	4- What is biodiversity 5- The value of biodiversity 6- Threats to biodiversity 7- Extinction, population viability 8- Conserving populations and species 9- Protected areas and ecosystem management
Readings	- Primack, R. (2012) A primer of Conservation Biology. 5th edition. Sinauer Associates. - Groom, M. (2006) Principles of Conservation Biology. Sinauer Associates. - Smith, T., Smith, R (2009): Elements of Ecology. 6th (or later) edition. Benjamin Cumming/Pearson. (chapters 13-15). - www.myecologyplace.com
Activity	**Review**
Module 5	**Ecological Restoration**
Key Concepts	Ecological restoration
Overview	One goal of conservation biology is to preserve biodiversity. In recent years, however, conservationists have turned their attention to areas severely altered by human activities. Such areas, if restored ecologically, can significantly contribute to the conservation of biodiversity and provide a variety of ecosystem services. Restoring certain ecosystems can also be a means of adapting to climate change. Restoration ecology is a modern discipline which is playing an important role in the planning and programs of government agencies and non-governmental organizations.

Aim	This module introduces the potential for taking action and restoring disturbed ecosystems in unprotected areas
Learning Outcomes	At the end of this module, students will be able to - Define ecological restoration - Discuss the goals and approaches of ecological restoration - Analyze the factors which affect the success of restoration programs - Demonstrate the significance of ecological restoration in a variety of case studies
Units	5- Ecological restoration 6- The use of bioremediation in restoration
Readings	- Clewell, A., Aronson, J. (2013): Ecological Restoration, Principles, Values, and Structure of an Emerging Profession. 2nd edition. Island Press. - Primack, R. (2012) A primer of Conservation Biology. 5th edition. Sinauer - Groom, M. (2006) Principles of Conservation Biology. Sinauer Associates. - Smith, T., Smith, R (2009): Elements of Ecology. 6th (or later) edition. Benjamin Cumming/Pearson. (chapters 13-15). - www.myecologyplace.com -
Activity	Presentations and group discussions

1. Course Specifics

Course Title	Food Science
Course Number:	303240

Course Prerequisite(s)	201101
Course Co-requisite(s)	None
Credit Hours	Lecture: 3 CH
Lecture Days & Time	
Class Location	
Course Instructor/s	Dr. Ghada Albandak
Syllabus Approved by: b. Academic Committee a. Department Chair	

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	Office Hours	E-mail Address
Dr. Ghada Albandak	Assistant Professor	Office No.:SB-F-42, Tel Ext. : 5604	**Mon** **Tue** **Wed** **Thu**	g.bandak@aum.edu.jo

3. Course Components

Resources:

- **Text book:**

Tittle	Food Science, An ecological approach.
Author	Edelstein S.
Publisher	Jones & Bartlett Learning
Edition	First ed., 2014

- **References:**

1- Title Food Science
Author Potter, N. and Hotchkiss, J.
Publisher Chapman and Hall
Edition 4th ed., 1995

2- Title Understanding Food Science and Technology
Author Murano, P.S.
Publisher Thomson, Australia
Edition 2003

3- Tittle Essentials of Food Science
Author Vaclavik, V. A., Christian E. W.
Publisher Springer

Edition 3rd ed., 2008

On line Resources:

1- Institute of Food Technologists (IFT) (www.ift.org/cms)
2- Codex Alimentarius (www.codexalimentarius.net)
3- Food and Agriculture Organization of the United Nations (www.fao.org)
4- World Health Organization (WHO) (www.who.org)

Course Description:

This course focuses on Chemical composition of food components, their physical properties and their functional roles. It discusses each of the food groups, such as carbohydrates, proteins, fats and oils,..etc., in terms of their composition and quality attributes. Beside that, an ecological approach to food science is targeted, so as to link between the climate change and food science. The effect of climate change on food science issues such as; food security, food production and quality is discussed. The concept of "going green" in food is also studied. The course also introduces principles of quality control and sensory evaluation of food.

Course General Objectives:

After completion of this course, the student will be able to:

6- Understand the principles of food science and different food terms.
7- Understand chemical composition of foods, their properties and functions.
8- Outline main reasons of perishability, sources of food spoilage.
9- Define the concept of shelf life.
10- Clarify the differences between Food Safety and Food Quality.
11- Understand the main attributes of Food Quality and means of preventing deterioration.

12- Identify principles of sensory evaluation.
13- Understand the effect of climate change on Food science issues.
14- Discuss the concept of going green related to food groups.

Course Intended Learning Outcomes (ILOs)/Competencies:

JJ) **Knowledge and understanding:**

20- Describe the chemical composition of food items, their reactions and role in nutrition.
21- Understand the role of food sciences in food and nutrition careers and technology.
22- Describe the methods of subjective and objective food quality evaluation.
23- Explain the role of water activity in food quality measurement.
24- Describe the reasons of food perishability, generally and for each type of the food groups.
25- Aknowledge the impact of climate change on food security, food production and quality.
26- Understand the effect of climate change on food production and food intake locally.
27- Describe the new trends in food science, like going green in food selection and production.

KK) **Cognitive and intellectual skills (thinking and analysis):**

1- Compare between different food components and their effect on food quality.
2- Analyze the food science applications; in industry, laboratory, quality assurance …etc.
3- Appreciate the sensory evaluation of food quality as a first impression affecting consumers' perception.
4- Appreciate the importance of quality evaluation and analysis of food.
5- Analyze the applications of food science for better health and for improvement of nutritional status.
6- Discuss new trends in food technology (such as GMO).
7- Analyze food problems related to the climate change locally and internationally.

LL) **Communication skills (personal and academic):**

23. Develop personal intercultural communication skills, through class activities and interaction.
24. Become creative by presenting topics of concern and new trend in food science and technology.
25. Exercise sensory evaluation by applying practical examples of food products from local market.
26. Adapt new ideas of food application and discuss their validity and degree of acceptance by society.
27. Conduct library research to find out more information about the recent concerning issues raised up around climate change impact on food production and security locally and worldwide.
28. Conduct Personal interviews, so as to gather information about consumer acceptance for different food types (such as junk food, ethnic foods, cultural home-made food).
29. Develop an idea about the areas which requires repair, awareness or development in food industry sectors.

MM) **Professional Skills:**

18. Collaborate with small group team members to assess and argue for or against certain issue of food conflicts
19. Prepare awareness sheet, publish it and distribute it among other colleagues of the university.
20. Field visit to food industrial sectors in order to understand how the production of food is regulated and quality is manipulated.
21. Suggest creative ideas for food awareness among school children, special needs…etc.

NN) **Practical and subject specific skills (Transferable Skills):**

19. Communication skills, covering both written and oral communications.
20. Problem-solving skills, relating to objective and subjective food quality evaluation.
21. Apply creative and critical thinking skills in carrying out studies related to new trends in food technology
22. Interpersonal skills, relating to the ability to interact with other people and to engage in team-working.
23. Time-management and organizational skills, as evidenced by the ability to plan and implement efficient and effective modes of working.
24. Encourage students to run small campaigns of climate change awareness within their colleagues and communities.

Teaching Methods:

The structure of this course is elaborated throughout lectures, classroom debates, assignments, exercises, homework and projects.
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Assessment Instruments

	Mark
Midterm Exam	30%
Quizzes, Homework and Participation	10%
Projects	20%
Final Exam	40%
Total	100%

Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates
Week 1:	Food Science-Introduction	
Week 2:	An ecological approach Impact of climate change on food science issues/Food Security	
Week 3:	Evaluation of Food Quality	
Week 4:	Sensory Evaluation	
Week 5:	Food composition/ Going green with food groups	
Week 6:	Water	
Week 7:	Carbohydrates	
Week 8:	**Midterm Exam**	
Week 9:	Grains: cereal, flour & rice	
Week 10:	Proteins: meat and meat substitutes	
Week 11:	poultry and fish	
Week 12:	milk and dairy products	
Week 13:	Eggs and egg replacements	

Week 14:	Fat and oil	
Week 15:	Fruits and vegetables/ Vegetarianism	
Week 16:	**Final Exam**	

Course Policies

University regulations are applied to this course, regarding class attendance; punctuality, exams, late submissions; absence with permission; penalties for cheating; and policies for assignments and projects – if any. Students should be aware of all those in addition to other rules and regulations stated and described in the student's handbook.

Module 1	**Food Science**
Key Concepts	Composition, quality, introduction, climate change.
Overview	Food Science is the science is based on studying the composition of food components. Their chemical and physical properties, their quality attributes, and reactions. The food groups are categorized according to their nutritional value, as water, carbohydrates, proteins, oil and fat,..etc. The course begins with a general overview and an introduction to the principles of food sciences, such as food chemistry, food processing, food safety...etc, their relationships to food science, then the quality attributes are studied, both the objective or subjective food quality evaluation method. Principles of consumer perception and sensory evaluation of food quality are also discussed. In the second week, an ecological approach to food science is also included. An introduction to ecological Literacy and The Current Need

	for an Ecological Approach, where the relationship between food sciences and environmental issues is discussed, the climate change mitigation, the effect of climate change on food supply and quality of health. Effect of food waste on climate change, effect of diet on climate change are also discussed.
Aim	The aim of this module is to: *Get through the concept of food sciences and their importance. *To define the different food groups based on their nutritional value. *To understand the difference between objective and subjective methods that are used in food quality evaluation. * Understand the effect of climate change on Food science issues. *Understand the relationship between climate change and quality of food, food shortage and insecurity. *discuss challenges to sustainably feeding the world.
Learning Outcomes	At the end of this module learners will be able to: *Describe the food components and categorize them regarding their nutritional value. *Understand the role of food science in food career and technology. *Describe the methods of subjective and objective food quality evaluation methods. *Describe the reasons of food perishability. *Link between environmental effects of climate change and food science issues. *Analyze the problems associated to climate change and discuss possible solutions.

Units	Chapter one: Food Science and Natural Environment. Chapter three: Sensory Evaluation. Chapter four: Food Composition.
Readings	Some of the suggested readings can be: *Sustainably feeding the world, from the main textbook page 19. *Food, Energy, and Society, for David Pimentel and Marcia Pimentel—Third Edition. Food Politics: How the Food Industry Influences Nutrition and Health for Marion Nestle.
Activity	Possible activites can be: *Visiting local farms and discuss the current climate change, food production, supply or shortage in local market *Visiting big supermarkets and collect data from owners and consumers. *Apply a questionnaire to a certain group of communities about their thoughts about Mediterranean diet, is adaptable to climate change, discuss, search, make questionnaires, check your community, debat and draw conclusions and suggestions for future work. *Check industrial sector, and find out if they are aware about healthy production, are they applying an environmental approach in their processes?

Module 2 Food groups

Key Concepts	food groups, going green, vegetarianism.
Overview	After understanding principles of Food Science and quality, and their relationship to climate change, then a deeper study will go through each of the food groups, one by one, by discussing their chemical composition and physical characteristics, their reactions and quality attributes. The application of concept of “going green” in food production and consumption is studied along with each of the food groups. The new trends in food industry, and biotechnology is also debated, like GMOs. The concept of vegetarianism is also discussed as well as quality and nutritional attributes of each of these food groups.
Aim	The aim of this module is to: *Get through the concept of “going green” in food production and their importance. *Define the chemical, physical and nutritional properties of each of the food components and their substitutes. *Define the new trends in food technology and production toward healthier and more environmentally friendly options.
Learning Outcomes	At the end of this module learners will be able to: *Describe the category of each of the food components based on their nutritional value. *Underline the chemical composition of food items and their reactions. *Discuss the meaning of the concept of “going green” as a new trend toward healthy options. * Analyze the new trends in food technology used to cope with climate change adaptation. *Debate the use of GMOs, Vegetarianism, food substitutes regarding their effectiveness and importance.
Units	Chapter 5: Meat and meat substitutes

	Chapter 6: Poultry and fish Food Science and Natural Environment. Chapter 7: Milk and Dairy products Chapter 8: Eggs and egg replacements. Chapter 9: Vegetarianism Chapter 10: Fruits and vegetables Chapter 11: Grains; cereals and breads Chapter 13: Fats and oils.
Readings	The Dietitian's Guide to Vegetarian Diets for Reed Mangels, Virginia Messina, Mark Messina. Phytonutrients and functional foods, in textbook page 114. Glycemic index of food, in textbook page 128 Mad cow disease from text book page 187
Activity	*Work with the people of special needs, the poor, elderlies, housewives, and the weakened parties to help them understand the value of healthy eating and living. *Gather data about variable deficiencies, disease and allergies available in your community, and find the link between these problems and food type, and weather conditions. Then make a campaign to aware people about its causes and how to prevent it.

APENDIX I: CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number: 303455

Nutrition Education
American University of Madaba, Faculty of Health Sciences, Department of Nutrition and Dietetics, Spring Semester, 2015

Instructor Information

Instructor: Dr. Fadwa Hammouh
Office Location: American University of Madaba Campus
Telephone: Office: +
Office Hours:
E-mail: f.hammouh@aum.edu.jo

Course Identification

Course Number: 303455
Course Name: Nutrition Education
Course Location: University Campus
Class Times:
Prerequisites: Dietetics+ Nutrition Counselling
Faculty Web Page: http://www.aum.edu.jo

Course Description/Overview

Nutrition education is the combination of educational strategies, accompanied by environmental supports, designed to facilitate the voluntary adoption of food choices and other food- and nutrition- related behaviours conducive to health and well-being. It is delivered through multiple venues and involves activities at the individual, institutional, community, and policy levels. There is an increased appreciation that our food choices are influenced by social and environmental context, where the personal, environmental, and policy influences on food choices are needed to be addressed. Nutrition educators have to work in collaboration with others on activities as school and community gardens, cooking with children and adults, farm- to- school programs, school and community wellness policies, and initiatives to improve policy, social structures, and systems. What the course offers is a good introduction to the area of nutrition education and how to design, deliver, and evaluate the types of

educational interventions and programs. It does so in three main parts. The first part provides background of theories for nutrition education and the implement of the theories in practice. Here, the course provides case studies, particularly related to climate change issues, showing how nutrition especially food choice and dietary change is affected by different determinants one of them is the environment and how nutrition educators can be "empowered" to make their voices heard in the process for rebuilding a more sustainable society more care about the type of food to choose and how the selection of diet will be affected to environment changes and related to as a result to health. The second part discusses the six- step process for translating theory and evidence into educational plans, and provides guidance on how to link evaluation to theory and intervention objectives. Finally, the third part describes the nuts and bolts of implementing nutrition education with diverse groups ranging from preschool children to older adults to low- literacy and low- income audiences through a variety of venues, including group sessions, written and visual materials, new technologies, and different case studies.

Course Learning Objectives

The overarching goals of this course are: a) to increase the awareness of nutrition education in schools, worksites and communities and describe how nutrition education can address several levels of influence to support people's ability to take action; b) raise awareness of the potential determinants or mediators of action and behaviour change as well as updated evidence for their use, and translate the different self- determination theories into practical nutrition education activities and the case examples will clarify the use of the different theories in educational activities in practical settings; and c) use the numerous personal, environmental, and policy influences on food choices and dietary behaviours to assist individuals and communities in practising healthy behaviours and identify risks related to climate changes and develop adaptation strategies.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

48. Discuss the various potential determinants or mediators of action of food choice and diet- related behaviour.
49. Design strategies for nutrition education.
50. Produce a brochure of 4-6 bands with simple and understandable information about any of the nutrition education topics and environmental changes.
51. Use case examples to understand the determinants of food choice and dietary change.

52. Develop a diet for three days that integrates the determinants of food choice and diet- related behaviour.

Course Resources

Required Course Texts and Materials

Hands-out prepared by the instructor for the class and the following books and website(s) will be helpful:

Contento, I. R. (2011). Nutrition Education: linking research, theory, and practice. 2nd edition, Jones and Bartlett Publishers. USA.

Abood, D.A., Black, D.R. and Feral, D. (2003). Nutrition education worksite intervention for university staff: Application of health belief model. Journal of Nutrition Education and Behaviour. 35(5): 260- 267.

American Dietetic Association (ADA).(2009).Who we are, what we do. http://www.eatright.org/cps/rde/xchg/ada/hs.xsl/home_404_ENU_HTML_htm.

Wendel-Vos, W., Droomers, M., Kremers, S., Brug, J. and van Lenthe, F. (2007). Potential environmental determinants of physical activity in adults: A systematic review. Obesity Reviews. 8(5): 425- 440.

Achterberg, C., and Miller, C. (2004). Is one theory better another in nutrition education? A viewpoint: More is better. Journal of Nutrition Education and Behaviour. 36 (1): 40-42.

Mayer, J. (1986). Social responsibilities of nutritionists. Journal of Nutrition. 116:b714- 717.

Baranowski, T. Buday, R., Thompson, D.I. and Baranowski, J. (2008). Playing for real: video games and stories for health- related behaviour changes. American Journal of Preventive Medicine. 34: 74- 82.

Peng, W. (2009). Design and Evaluation of a computer game to promote a healthy diet for young adults. Health Communication. 24: 115-127.

Abusabha, R., Peacock, J., and Achterberg, C. (1999). How to make nutrition education more meaningful through facilitated group discussions. Journal of the American Dietetic Association. 99: 72- 76.

Bronner, Y. (1994). Cultural sensitivity and nutrition counselling. Topics in Clinical Nutrition. 9: 13-19.

Food Research and Action Center (FRAC). (2006). http://www.frac.org.

Desjardin, E., Drake, L., Estrow, F. And Roberts, S. (2005), July. Food policy councils and the role nutritionists play. Presented at the annual conference at the Society for Nutrition Education, Orlando, FL.

California Department of Public Health. (2007). Network for a healthy California. http://www.dhs.ca.gov/ps/cdic/cpns/network.

Centre for Food and Justice. (2010). About the national farm to school program. http://www.farmtoschool.org/about.htm.

Engbers, L.H., van Poppel, M.N., Paw, A., Chin, M.J., and van Mechelen, W. (2005). Worksite health promotion programs with environmental changes: A Systematic review. American Journal of Preventive Medicine. 29(1): 61- 70.

Nestle, M. (2002). Food politics: How the food industry influences nutrition and health. Berkeley: University of California Press.

Medeiros, L., Hillers, V., Kendall, P., and Mason, A. (2001). Evaluation of food safety education for consumers. Journal of Nutrition Education. 33: s27- s34.

Ziegelmann, J.P. and Lippke, S. (2007). Planning and strategy use in health behaviour change: A life span view. International Journal of Behavioural Medicine. 14(1): 30- 39.

Buchanan, D. (2004). Two models for defining the relationship between theory and practice in nutrition education: Is the scientific method meeting our needs? Journal of Nutrition Education and Behaviour. 36: 146- 154.

Optional Course Texts and Materials

Story, M. Kaphingst, K.M. et.al. (2008). Creating healthy food and eating environments: Policy and environmental approaches. Annual Review of Public Health. 29: 253- 272.

Olson, C.M. and Kelly, G.L. (1989). The Challenge of implementing theory- based intervention research in nutrition education. Journal of Nutrition Education. 22: 280- 284.

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)

Assignments	80%
Exams	
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a discussion type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than five classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	Course Overview: Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2	Issues in nutrition education: An introduction
3	Overview of Determinants of Food Choice and Dietary Change: Implications for Nutrition education 1-Food- related determinants: Biology and experience
4	2-Person-related determinants 3-Economic determinants
5	4-Social and environmental determinants
6	5-Information environment
7	Implication for nutrition education
8	Implication for competencies and skills for nutrition educators
9	**Mid-term Exam**
10-11	Works with diverse population groups 1-Working with children, youths, and adults 2-Working with diverse cultural groups 3-Low- literacy audiences
12	Nutrition educators as change agents in the environment
13	Foundation in theory and research: Promoting environmental supports for action 1-Interpersonal environment: Family, peers, and social support
14	2-Organizational- level environmental change 3-Community- level activities 4-Policy and systems change activities

15	Projects discussion
16	**Final Exam**

APENDIX II: The CLIMASP Course Modules Template Example

Course	**Nutrition Education**
Module 1	Issues in Nutrition education
Key Concepts	Nutrition education, dietary guidance
Overview	When I ask my students what nutrition education means to them, they always indicate that it means the how to teach nutrition. However, the term "nutrition education" means more things. Nutrition educator also is another term to be discussed. It is therefore very important for students to evaluate the nutrition educator different works. Questions to be addressed in this module include the following: What is nutrition education? Why is nutrition education needed?

	What are the major functions of nutrition educators?
Aim	The overriding aim of this module is to make students able to define nutrition education, and state why it is important and difficult to do, also to describe what nutrition educators do.
Learning Outcomes	At the end of this module learners will be able to: • Define nutrition education and state why it is important and difficult to do • Evaluate the purposes and scope of nutrition education. • Describe what nutrition educators do.
Units	Chapter 1: Issues in Nutrition Education: An Introduction
Readings	Contento, I. R. (2011). Nutrition Education: linking research, theory, and practice. 2nd edition, Jones and Bartlett Publishers. USA. Abood, D.A., Black, D.R. and Feral, D. (2003). Nutrition education worksite intervention for university staff: Application of health belief model. Journal of Nutrition Education and Behaviour. 35(5): 260- 267. American Dietetic Association (ADA).(2009).Who we are, what we do. http://www.eatright.org/cps/rde/xchg/ada/hs.xsl/home_404_ENU_HTML_htm.
Activity	**Overview** Assignment 1.1: Nutrition Education 1. State reasons why nutrition education is needed for the public? (3-5 reasons) Describe your reasons. 2. What do you think about the approaches to nutrition education? Discuss. Assignment 1.2: Nutrition Educators Where you see yourself as a nutrition educator? What would you like to do?
Module 2	Implications for Nutrition Education: Determinants of Food Choice and Dietary Change
Key Concepts	Determinants of food choice and dietary behavior

Overview	Influences on food choice and dietary practices and their implications for nutrition education are discussed. This module will outline the determinants of food choice and diet- related behavior, where each determinant will be defined and the different factors affecting each of them will be discussed. A focus will be on the environmental determinants and the effect of climate changes on food choice and dietary behavior. Questions to be addressed in this module are: What are the research evidence for the influences of the different discussed determinants on human food choice and dietary behaviour? What is the role of intra- and interpersonal processes in food choice and dietary behaviour?
Aim	The overriding aim of this module is to overview the numerous influences on food choice and dietary practices and their implications for nutrition education and provides the competencies needed to be an effective nutrition educator.
Learning Outcomes	At the end of this module learners will be able to: • Identify examples of determinants of food choice and dietary behaviour. • State the competencies needed to be an effective nutrition educator.
Units	Chapter 2: Overview of Determinants of Food Choice and Dietary Change. Chapter 3: Facilitating Why and How to Take Action.
Readings	Contento, I. R. (2011). Nutrition Education: linking research, theory, and practice. 2nd edition, Jones and Bartlett Publishers. USA. Abusabha, R., Peacock, J., and Achterberg, C. (1999). How to make nutrition education more meaningful through facilitated group discussions. Journal of the American Dietetic Association. 99: 72- 76. Bronner, Y. (1994). Cultural sensitivity and nutrition counselling. Topics in Clinical Nutrition. 9: 13-19. Food Research and Action Center (FRAC). (2006). http://www.frac.org.

Activity	**Overview** Discuss how can nutrition educators help young children learn to self-regulate the amount of food they eat? Which competencies do you believe that you already posses? Which one would you like to develop further?
Module 3	Foundation in theory and research
Key Concepts	Theories and models for effective nutrition education and communication, food choice
Overview	Research suggests that the adoption and maintenance of health behaviours are a process involving two main phases: a decision- making or deliberative phase, and an action or implementation phase. This means that nutrition education programs should consists of both a motivational pre-action phase or component and a postdecision action and maintenance component. Different theories and research that explain the important role of food choice and nutrition- related behaviour change are discussed. Also a description for how each theory can be translated into effective nutrition communication and education. Questions to be answer: How theories have been used in nutrition education programs to increase awareness and enhance motivation? Describe the health belief model?
Aim	This module aims to focus on theories that can be translated into effective nutrition education.
Learning Outcomes	At the end of this module learners will be able to: • Describe theories that help nutrition educators understand motivation for health and nutrition behaviours. • Identify and design strategies to address potential mediators of change.

Units	Chapter 4: Foundation in Theory and Research: Increasing Awareness and Enhancing Motivation. Chapter 5: Facilitating the Ability to Take Action. Chapter 6: Promoting Environmental Supports for Action.
Readings	Contento, I. R. (2011). Nutrition Education: linking research, theory, and practice. 2nd edition, Jones and Bartlett Publishers. USA. Abood, D.A., Black, D.R. and Feral, D. (2003). Nutrition education worksite intervention for university staff: Application of health belief model. Journal of Nutrition Education and Behaviour. 35(5): 260- 267. Nestle, M. (2002). Food politics: How the food industry influences nutrition and health. Berkeley: University of California Press. Medeiros, L., Hillers, V., Kendall, P., and Mason, A. (2001). Evaluation of food safety education for consumers. Journal of Nutrition Education. 33: s27- s34. Ziegelmann, J.P. and Lippke, S. (2007). Planning and strategy use in health behaviour change: A life span view. International Journal of Behavioural Medicine. 14(1): 30- 39. Buchanan, D. (2004). Two models for defining the relationship between theory and practice in nutrition education: Is the scientific method meeting our needs? Journal of Nutrition Education and Behaviour. 36: 146- 154.
Activity	**Overview** Assignment 1: Case Study for Nutrition Education using the Health Belief Model 22. Think of 5 possible outcomes for the theories mentioned in the case? 23. Think of a climate change and discuss its effect on health- related behaviour? Discuss its effect on your community?

24. Describe strategies that nutrition educators can use to enhance motivation for healthy eating and active living? (3-5 strategies)

Assignment 2: Prepare a brochure for one of the nutrition education theories or determinants.

For this activity: Work in groups (2-3 in each).

1. Course Specifics

Course Title	Bio-Ethics
Course Number:	900116
Course Prerequisite(s)	None
Course Co-requisite(s)	None
Credit Hours	Lecture: 3 hrs
Lecture Days & Time	
Class Location	BB- S04
Course Instructor/s	Dr. Ahmed A-Smadi
Syllabus Approved by:	
b. Academic Committee	
a. Department Chair	Prof. Adi Arida

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	E-mail Address
Ahmed Al-Smadi	Assisstant Prof.	SB-G 37 Ext. 5607	a.smadi@aum.edu.jo

3. Course Components

Resources:

- **Text book:**

Bioethics: An Introduction
Author: By: Marianne Talbot,
Publisher**:** University of Oxford

Resnik, D. B. (2009). Bioethics and Global Climate Change. In Bioethics forum (Vol. 39, No. 3, p. 1). NIH Public Access.

Moorthy, R., Choy, E. A., Selvadurai, S., & Lyndon, N. (2011). Bioethics principles in the teaching of climate change. American Journal of Applied Sciences, 8(10), 962.

Macpherson, C. C. (2013). Climate Change is a Bioethics Problem. Bioethics, 27(6), 305-308.

Course Description:

Bioethics studies the reasonableness of human choices and actions that typically occur in medical practice. In this course, we will study the particular subsection of this realm that covers issues involving medical care and biotechnology. Our consideration will extend to other areas where human life and death are involved, such as abortion, and genes. The course aims to develop moral wisdom and moral virtue.
This course is divided into four main sections. The first section aims to introduce bioethics and related terminologies and theories. The second explores bioethics issues related to pregnancy such as abortion, and pre implantation genetic diagnosis. The third section focus on the bioethical issues related to manipulation of humans' organs and tissues such as organ donation and stem cell research. The fourth section explores the bioethics and it is relation with climate changes.

Students in this course will participate in developing an awareness source such as booklet, video, or poster for two main topic discuses in the course; the first will be focus on one of the following topics: abortion, pre implantation genetic diagnosis, assisted reproductive technology, and pre natal genetic diagnosis. The second will focus on the relationship between bioethics and climate change.

In addition, before the end of the course, students can address and present any of bioethics related topic.

Course General Objectives:

The overreaching goals of this course are:

- A) To review central moral, philosophical, and social problems in medicine and health policy
- B) To differentiate between ethical questions and non-moral questions. Summarize and analyze arguments for a particular ethical conclusion.
- C) To identify ethical issues when they arise in the context of healthcare, biotechnology, and the role of a physician.
- D) To see the relevance of philosophy to the life sciences and social policy.
- E) To develop and practice skills relevant to preparing and delivering public presentations.
- F) Engage students in analysis of major contemporary controversies, enabling each student to acquire in-depth knowledge of one controversial issue concerning bioethics of their choice.

Course Intended Learning Outcomes (ILOs)/Competencies:

5- Demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to the subject areas identified above.
6- Apply such knowledge and understanding to the solution of qualitative and quantitative problems of a familiar and unfamiliar nature.
7- Recognize and analyze novel problems and plan strategies for their solution.
8- Students will be able to apply scientific approach in solving problems.
9- Ability to interpret data derived from theoretical observations and measurements in terms of their significance and the theory underlying them.

10- Participation shows an active engagement with the course and adequate familiarity with the assigned reading
7. Apply creative and critical thinking skills in carrying out studies.
8 . Develop interpersonal skills, relating to the ability to interact with other people and to engage in team-working.

Teaching Methods:

The structure of this course is elaborated throughout lectures, classroom debates, assignments, exercises, homework and projects.

Assessment Instruments

	Mark
1st Assessment	15%
2nd Asswssment	15%
Quizzes, participation and Homework	10%
Project presentation	10%
Final Exam	50%
Total	100%

Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates

Week 1:	Introduction to Bioethics	
Week 2:	Introduction to Bioethics	
Week 3:	Abortion	
Week 4:	Abortion	
Week 5:	Assisted Reproductive technology	
Week 6:	Presentation of student's (first assessment)	
Week 7:	Pre-natal testing/ Pre-implantation genetic diagnosis	
Week 8:	Organ donation	
Week 9:	Organ donation	
Week 10:	Stem Cell research	
Week 11:	climate change: introduction	
Week 12:	Bioethics and climate change	
Week 13:	Bioethics and action to be taken for climate change	
Week 14:	Presentation of student's (second assessment)	
Week 15:	Students' presentation	
Week 16:	Students' presentation	

Course Policies

Lecture attendance is mandatory. If the rate of student absences, in a course unit, is greater than 15% (or 20% for student representing the University in sportive or cultural activities) of the completely accredited hours and the student has no acceptable justification, then this student is excluded from that course unit. If the Dean of the faculty accepts the justifications of absence, then this student is mentioned as withdrawn without refunding the registration fees.

Make-up exams, if existed, will be offered for valid reasons only with consent of the Dean. Make-up exams may be different from regular exams in content and format.

Mobiles are not tolerated in the class, and should be turned off during the lecture time.

Course	Bio-Ethics
Module 1	Introduction to Bioethics
Key Concepts	Bioethics, Ethics, morality, law, ethical dilemma, ethical theories, culture assimilation, decision making model, ethical committees,
Overview	This module gives an introduction to bioethics. Questions to be addressed in this module include the following: What is the definition of the following terminologies: Bioethics, Ethics, morality, law, and ethical dilemma? What are the ethical issues in modern healthcare? What are the differences between different ethical theories? What is the relationship between cultural diversity and ethics? How can we implement the decision making model to solve bioethical issues? What are the roles of the ethical committees?
Aim	The overall aim of this module is to turn student able to understand the nature of bioethics and related ethics theories.
Learning Outcomes	At the end of this module students will be able to: • Identify the different concepts related bioethics. • Discuss the ethical issues related to modern healthcare. • Implement the decision making model to solve bioethical issues. • Identify the roles of the ethical committees. .
Readings	Instructor hand outs

Activity	**Overview** During this module a discussion between students will be raised about different aspects such as different ethical issues, and role of ethical committees. In addition, a student's "Role Play" will be conducted to discuss those issues.
Module 2	Bioethical issues related to pregnancy
Key Concepts	The story of a little human being, Abortion, Assisted Reproductive technology, Pre-natal testing, Pre-implantation genetic diagnosis
Overview	This module introduces the Bioethical issues related to pregnancy. The module aims to answer the following questions: What does abortion mean? What are the different methods of abortion? What are the psychological and physiological consequences to the abortion? Is abortion considered wrong or right? Why? What is assisted reproductive technology? What are the methods of assisted reproductive technology? What are the psychological and physiological consequences to the assisted

	reproductive technology? Is assisted reproductive technology considered wrong or right? Why? What is preimplantation genetic diagnosis? What are the different methods of preimplantation genetic diagnosis? What are the ethical issues related to preimplantation genetic diagnosis? What is Prenatal testing and diagnosis? What are the different methods of Prenatal testing and diagnosis What are the ethical issues related to Prenatal testing and diagnosis?
Aim	The over aim of this module is to introduce ethical issues related pre, during pregnancy.
Learning Outcomes	At the end of this module students will be able to : • Identify different bioethical issues related to pregnancy. • Discuss the ethical implication of abortion, preimplantation genetic diagnosis, assisted reproductive technology, and prenatal testing.
Readings	. Instructor selected readings.

	. Selected YouTube
Activity	**Overview** During this module a discussion between students will be raised about different aspects such as abortion, preimplantation genetic diagnosis, assisted reproductive technology, and prenatal testing. In addition, a student's "Role Play" will be conducted to discuss those issues. Moreover, each student will have the chance to develop and present an educational material such as booklet, video, or poster about bioethical issues related to preganancy .
Module 3	Uses of organs and tissue in health care
Key Concepts	Organ donation, Stem Cell research
Overview	This module introduces the Bioethical issues related to Uses of organs and tissue in health care. The module aims to answer the following questions: How can we distribute organs fairly? How can we increase the pool of donors ethically? What are the arguments for and against opt-out? What are the ethical considerations related to organ donation? What are the stakes of stem cell research? What are the Sources and implications of stem cells? What are the ethical considerations related to stem cell research?
Aim	The over aim of this module is to introduce Uses of organs and tissue in health care particularly Organ donation, Stem Cell research.
Learning Outcomes	At the end of this module students will be able to: • Discuss the uses of organ donation and stem cells. • Identify the different methods of distribution for donated organs. • Discuss the ethical considerations related to uses of organ donation and stem cells.
Readings	Selected hand outs by the instructor.
Activity	**Overview** During this module a discussion between students will be raised about

	different aspects such as types of using Organ donation, and Stem Cell research. In addition, a student's "Role Play" will be conducted to discuss those issues. Moreover, each student will have the chance to develop and present an educational material such as booklet, video, or poster related to Organ donation, or Stem Cell research.
Module 4	Bioethics and Climate change
Key Concepts	climate change: introduction, Bioethics and climate change, Bioethics and action to be taken for climate change
Overview	This module focuses on bioethics it is relationship with climate change. The module introduces the climate change as a global challenging problem. The module aims to answer the following questions: What is climate change? Should bioethics take part in global warming? How? How bioethics and health analysis can impact positively on environment? What is the relationship between biomedical waste management and climate change? What are the actions that can be taken by health care personal to minimize the climate change?
Aim	The overall aim of this module is to introduce global warming and it is relationship with bioethics.
Learning Outcomes	At the end of this module students will be able to: • Identify the climate change and it is consequences as a global problem. • Discuss the relationship between bioethics and climate change.

	• Identify how health care persona l can impact positively on environment? • Discuss the relationship between biomedical waste management and climate change? • Discuss the actions that can be taken by health care personal to minimize the climate change.
Readings	Selected hand outs by instructor
Activity	**Overview** During this module a discussion between students will be raised about different aspects such as climate change and bioethical issues, and actions to be taken by health care professional to minimized climate change. In addition, a student's "Role Play" will be conducted to discuss those issues. Moreover, each student will have the chance to develop and present an educational material such as booklet, video, or poster related to bioethics and climate change.

Faculty: Engineering
Department: Civil Engineering

Course Syllabus

Course Title: Energy and the Environment	**Course Number:** 900170
Course Prerequisite(s) and/or Co-Requisite(s):	**Credit Hours:** 3
Lecture Days, and Timing:	**Course Prepared By:** Dr. Assal Haddad
Course Approved By **a. Name of Academic Coordinator:** Dr. Assal Haddad **b. Name of Department Committee Representative:** Dr. Munther Nimri **c. Dean:** Dr. Kareem Numayr	

Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	Office Hours	E-mail Address
Dr. Assal Haddad	Assistant			a.haddad@aum.edu.jo

Course Description: Population growth, Energy demand, Energy renewable resources; Solar energy, Wind energy, Photovoltaic energy, Hydraulic energy, Bioenergy, Non-renewable energy resources; Oil, Coal, Natural gas, Nuclear energy, Environmental impacts; Global

warming, Ozone depletion, Acidification, Hazardous air pollution, Indoor air pollution, Life Cycle Assessment (LCA), Sustainability, Green buildings; LEED certified buildings. Mitigation of and adaptation to climate change.

Course Objectives:

- Understand the technological, economic, and social factors related to use of various forms of energy such as fossil fuels, solar energy, wind energy, biofuels, and other alternative and renewable energy resources (*scientific inquiry*).
- Understand why at various times and locations, different patterns of energy extraction, consumption, and conservation are used (*logical and integrative thinking*).
- Understand the limitations imposed on using various forms of energy by technological and socioeconomic factors (*quantitative skills*).
- Understand how energy conversion methods are used to change energy from one form to another for appropriate use (*quantitative skills, scientific inquiry*).
- Understand the tradeoffs between use of energy to raise the standard of living and the impact resulting from use of energy to the environmental pollution (*quantitative skills, ability to use modern technology, using resources*).
- Use various sources of knowledge to write logical and coherent papers on important aspects of energy and environment (*communication skills, scientific inquiry*).
- Understand how public policy can direct citizen's efforts in *wiser* use of energy resources, energy conservation, and prevention of pollution to the environment (*synthesis of knowledge from various disciplines*).
- Understand the causes and consequences of climate change and how to mitigate and adapt to environmental change.

Course Components:

Text book:

Title**:** Energy: Its Use and the Environment

Author**:** Roger A. Hinrichs, Merlin H. Kleinbach
Publisher: Thomson Brooks/ Cole; 4 edition (2005)

- ISBN-10: 047092764X

- ISBN-13: 978-0470927649

Course References:

1. "The Crash Course: The Unsustainable Future Of Our Economy, Energy, And Environment", Chris Martenson, 2011.
2. "Energy and the Environment", Robert A. Ristinen , Jack P. Kraushaar, 2005.
3. "The Impending World Energy Mess (The Environment)", Robert L. Hirsch, Roger H. Bezdek, Robert M. Wendling, 2010.
4. " The Post Carbon Reader: Managing the 21st Century's Sustainability Crises", Richard Heinberg (Editor), Daniel Lerch (Editor), 2010.

Links on Web Research, Supplemental Soft Sources:

1. http://energy.sourceguides.com/news.shtml : Provides daily news on the latest achievements in the field of renewable energy around the world to familiarize the student with current issues related to the energy-environmental impacts.

2. http://www.darvill.clara.net/altenerg/index.htm : A comprehensive list of the various energy resources on the planet; providing brief information on each type, which is helpful for comparison purposes.

3. www.thestoryofstuff.org

4. Technical journal papers and other materials will be periodically provided by the instructor during class. These materials should be reviewed and analyzed as they will be an integral part of class discussions and your knowledge development.

Teaching Methods: (Examples; Use the Applicable Ones)

Lectures: One and half hour lectures twice a week.
Home work: Selected sets of homework problems will have to be turned in for grading as announced by the instructor. All work submitted must be done neatly and professionally, by showing clearly all steps of the solution and labeling all answers.
Term paper to be supplied by the student on certain topics of the course.

Learning Outcomes:

- **Knowledge and understanding:** The students will differentiate between renewable and non-renewable sources of energy, and assess the various sources of energy based on their impact on the environment and society we live in.
- **Cognitive skills (thinking and analysis):** Students will be able to analyze the impact of using any particular energy resource in a "cradle to grave" point of view, from an environmental perspective; that is, environmental impacts associated with material extraction, transformation of fuel to energy, delivery of energy, and solid, liquid and gaseous waste output during the process.
- **Communication skills (personal and academic):** Students will form groups that will eventually produce a basic Life Cycle Assessment (LCA) comparing two products or processes chosen by the instructor, and will share their conclusions with the other teams. Also, students will present their term paper findings in front of their colleges and be able to answer other student's questions and defend their conclusions.

Assessment Instruments: (For Example)

Allocation of Marks	
Assessment Instruments	**Mark**

First examination	**20%**
Second examination	**20%**
Final Exam (written unseen exam)	**50%**
Reports, Research Projects, Quizzes, Home Works, Projects	**10%**
Total	**100%**

Documentation and Academic Honesty (Pledge of Honor):

- **Protection by Copyright**

Students will abide to the code of honour of the American University of Madaba.

- **Avoiding plagiarism**.

Students will abide to the code of honour of the American University of Madaba.

Course Academic Calendar:

Week	Basic and support material to be covered	Resources	Homework/reports and their due dates
1	Introduction to energy concepts and issues		
2	Population exponential increase		
3	Sustainable living		
4	Green buildings and LEED certification		
5	First exam		
6	Solar energy		
7	Photovoltaic and wind energy		

8	Fossil fuel		HW: Middle east and oil
9	Global warming and Ozone depletion		
10	Second exam		
11	Air pollution		
12	Waste management and landfills		
13	Nuclear power		Presentation about Jordan nuclear project
14	Biomass and geothermal energy		
15	Life Cycle Assessment (LCA)		
16	Final exam		

Expected workload:

On average you should expect to spend at least four hours per week on this module.

Attendance policy:

Lecture attendance is mandatory. If the rate of student absences, in a course unit, is greater than 15% (or 20% for student representing the University in sportive or cultural activities) of the completely accredited hours and the student has no acceptable justification, then this student is excluded from that course unit. If the Dean of the faculty accepts the justifications of absence, then this student is mentioned as withdrawn without refunding the registration fees.

Make-up exams, if existed, will be offered for valid reasons only with consent of the Dean. Make-up exams may be different from regular exams in content and format.

Penalty for Cheating, Plagiarism, and Mobile Usage inside rooms:

As per University regulations
Mobiles are not tolerated in the class, and should be turned off during the lecture time.

Course	Energy and the Environment
Module 1	Sustainability
Key Concepts	Population growth, sustainable building, LEED certificate.
Overview	At any level of development, human impact on the environment is a function of population size, per capita consumption and the environmental damage caused by the technology used to produce what is consumed. People in developed countries have the greatest impact on the global environment. The 20% of the world's people living in the highest income countries are responsible for 86% of total private consumption compared with the poorest 20%, who account for a mere 1.3%. The richest fifth account for 53% of carbon dioxide emissions, the poorest fifth, 3%. A child born in the industrial world adds more to consumption and pollution levels in one lifetime than do 30-50 children born in developing countries. As living standards rise in developing countries, the environmental consequences of population growth will be amplified with ever-increasing numbers of people aspiring, justifiably, to "live better." Rather than assign blame in the debate over environmental challenges, both current and new consumers need to realize and address the consequences of their levels of consumption.
Aim	The aim of this module is to establish a strong and clear link between the decisions that individuals and societies make and the environment they live in.
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss various types of sustainable activities and life styles. • Understand the basic criteria and specifications by which the LEED certificate assesses green buildings.
Units	Unit 1.1 Introduction to Energy as a concept Unit 1.2: Population Growth

	Unit 1.3: Sustainability Unit 1.4: LEED certificate
Readings	www.thestoryofstuff.org
Activity	**HW. #1** Assess the buildings of your campus in terms of LEED criteria, and try to assign a grade to every credit point in the certificate. Report the final result of your assessment (Fail or pass), and provide suggestions to improve the sustainability level for your campus.
Module 2	Energy Resources
Key Concepts	Renewable and non-renewable energy resources, Oil politics
Overview	The bulk of our energy requirements today is met by fossil fuels, which are in short supply. At present rates of consumption, known reserves of natural gas will be exhausted within 35 years, and of petroleum within 70 years. If these rates continue to grow exponentially, as they have done since 1960, then natural gas will be exhausted within 14 years, and petroleum within 20. Coal is likely to last much longer (about 300 years), but the fossil fuels in general are required for so many purposes other than fuel – pesticides, fertilisers, plastics, and so on, making it virtually impossible to depend on it for energy. In an energy sense, sustainability has quite a concrete meaning, and points society in the clear direction of renewable energy. Some years ago renewable energy was not taken as a serious option and the notion of life after fossil fuels was not properly considered in the hope that the "market" would come up with something, probably making use of nuclear fission or fusion.

	It is imperative to realise that humanity has rapidly moved from a society that was primarily lived at the local level and in a sustainable manner to one of contemporary excess. In the past, sustainability was not such an important issue, since in general human society did not have the technology or the scale to live unsustainably. With the discoveries of recent times, this is no longer the case. We have moved into a situation where our powers have multiplied, and without much thought we have simply raced forward to use these powers. We are clearly in an adolescent phase, and are only beginning to think about the responsibilities of adulthood as a society. The good news is that we can be confident that adulthood will follow adolescence. Knowledge of purpose combined with an increasing appreciation of the wonder and complexity of the natural world will result in the human race "living lightly" upon the earth.
Aim	The aim of this module is to identify the impacts associated with the use of fossil fuel which is generally linked to a modern life style, but at the same time introduce the alternative of renewable energy resources and describe the physics behind the attainable possibilities of such choices.
Learning Outcomes	At the end of this module learners will be able to: • Identify fossil fuel origins and extraction methods. • Identify various typical and innovative types of renewable energy resources.
Units	Unit 2.1: Fossil fuel (Oil, Coal, and Natural Gas) Unit 2.2: Renewable Energy resources (Solar, Photovoltaic, Wind, biofuel)
Readings	http://energy.sourceguides.com/news.shtml

Activity	**HW. #2** Describe a new innovative renewable energy resource and describe the physics that lie behind the harnessing of energy, efficiency, and price.
Module 3	Pollution
Key Concepts	Air pollution, Global Warming, Ozone depletion, water pollution, Life Cycle Assessment, Solid waste management.
Overview	The increasing threat of global warming and climate change has attracted attention about the relationship between economic growth, energy consumption, and environmental pollution. Though Global warming depends on worldwide Greenhouse Gas (GHG) emissions, its consequences differ among countries, based on the latter's' social and natural characteristics. If no action is taken to reduce GHG emissions, the concentration of GHGs in the atmosphere could double as early as 2035 from its pre-industrial level. This implies that in the short run, global average temperature may rise by over 2°C. In the longer term, there is a greater than a 50% chance that this rise in temperature would exceed 5°C. This radical change in temperatures would affect all countries. Among them, the earliest and the hardest hit would be on the poorest and populous nations, even though they contributed least to GHG emissions. The Kyoto Protocol to the United Nations Framework Convention on Climate Change was a cornerstone in the promotion of renewable energy sources. However, by itself it became unsuccessful in addressing the issues pertaining to the climate change challenge and came up with a judgmental and adequate roadmap. Renewable energy sources are accepted as one of the key solutions to climate change and the increasing energy demand. Every country, either developing or developed is promoting and adopting policies to switch over the energy consumption towards renewable energy sources.

Aim	This module aims at linking our dependence on fossil fuels to the deteriorating quality of our environment and the risks of a global catastrophe.
Learning Outcomes	At the end of this module learners will be able to: • Demonstrate knowledge on the negative contribution of different types of emissions on the environment. • Conduct a Life Cycle Assessment comparing two industrial or commercial options.
Units	Unit 3.1: Global Warming Unit 3.2: Ozone Depletion Unit 3.3: Indoor air quality Unit 3.4: Solid Waste Management Unit 3.5: Life Cycle Assessment.
Readings	Title**:** Energy: Its Use and the Environment Author**:** Roger A. Hinrichs, Merlin H. Kleinbach Publisher: Thomson Brooks/ Cole; 4 edition (2005)
Activity	**HW. #3** Conduct a LCA comparing two industrial or commercial options.

1. Course Specifics

Course Title	**Applied Plant Biology**
Course Number:	**0201323**
Course Prerequisite(s)	**0201221**
Course Co-requisite(s)	
Credit Hours	**2**
Lecture Days & Time	
Class Location	
Course Instructor/s	**Dr. Isam Fattash**
Syllabus Approved by:	
a. Department Chair	**Dr. Fares Khoury**

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	Office Hours	E-mail Address
Dr. Isam Fattash	**Assistant Professor**	**SB-G39 5620**		**isam.fattash@utoronto.ca**

3. Course Components

Resources:

- **Text book:**

1. Adrian Slater, A., Scott, N.W., and Flower, M.R. 2008. 2nd Edition. Plant Biotechnology, The Genetic Manipulation of Plants. Oxford University Press.
2. McMahon, M.E., Kofranek, A.M., Rubatzky, V.E. 2011. 5th Edition. Plant Science: Growth, Development, and Utilization of Cultivated Plants. Pearson/Benjamin Cummings, San Francisco, CA.
3. Hartmann, H.T., Kester, D.E., Davies, F.T., Geneve, R. 2011. 8th Edition. Plant Propagation: Principles and Practices. Pearson/Benjamin Cummings, San Francisco, CA.

- **References:**

  In addition to the above textbooks, students will be provided with handouts by the lecturer.

Course Description/Overview:

The course provides students with the flexibility to adapt their learning experience towards the main applications of plant biotechnology and the genetic basis of these applications. Applied plant biology explores how plants grow, develop, reproduce, evolve, fight off pests and diseases, and interact with and respond to their environment. Through a weekly two hour lecture, this module will describe traditional and genetic methods of plant manipulation. Topics will include tissue culture and its applications, the properties of plant symbionts and pathogens as they relate to biotechnology and the different applications of plant genetic engineering. Production of both novel and traditional plant products and their uses in biotechnological industries will be discussed. In addition, students will be introduced to the diverse therapeutic application of different plant products against various pharmacological targets including cancer, human brain, cardiovascular function, microbial infection, inflammation, pain, and many more.

The course will review possible procedures and methods of using plants to generate new products, such as foods, pharmaceuticals, or biofuels or processes, to solve environmental problems like food security and dwindling natural resources. Abiotic stresses cause morphological, physiological, biochemical, and molecular changes that adversely affect plant growth and productivity, and ultimately yield. Heat, drought, cold, and salinity are the major abiotic stresses that induce severe cellular damage in plant species, including crop plants. The molecular effect of such abiotic stresses on plant development and production are stressed. The impact of global climate change on crop production and food security would be addressed.

Course learning Objectives:

This course aims to 1) expose students to the theory and practice of many of the current techniques and advances of plant biology research, 2) provide students with an opportunity to develop an in-depth understanding of a specific area of plant biology, and 3) introduce students to biological research as a career.

Course Outcomes:

Upon successful completion of this course, students will be able to

1. Determine the importance of plant sciences to humankind.
2. Differentiate between classical and genetic approaches in plant/crop improvement.
3. Infer new techniques in plant breeding and propagation.
4. Signify the importance of medicinal plants, organic agriculture, and biofuel.
5. Describe different technologies that enable the genetic manipulation of crop plants.
6. Describe in detail the development of herbicide and pest resistance.
7. Discuss in detail the development of disease resistance.
8. Evaluate advantages and disadvantages of genetically modified crops and understand their future prospects.
9. Diagnose the impact of climate change on plant production and diversity.

Teaching Methods:

The structure of this course is elaborated throughout lectures, classroom debates, assignments, exercises, homework and projects. The theoretical part is closely related to and harmonized with the course (0201221) and its lab.

Assessment Instruments

	Mark
Midterm Exam	30%
Quizzes, Homework and Participation	10%
Project	20%
Final Exam	40%
Total	100%

Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates
Week 1	Economic importance of plants	

Week 2	Sustainable and organic agriculture	
Week 3	Medicinal plants	
Week 4	Plant breeding for plant improvement	
Week 5	Plant propagation	
Week 6	Plant cell and tissue culture	
Week 7	Techniques for plant transformation	
Week 8	The genetic manipulation of herbicide resistance	
Week 9	The genetic manipulation of pest resistance	
Week 10:	Reducing the effects of viral disease	
Week 11:	Strategies for engineering stress tolerance	
Week 12	The improvement of crop yield and quality	
Week 13:	Molecular farming	
Week 14:	Science and society: the public acceptance of GM crops	
Week 15	The impact of global climate change on crop production	
Week 16:	**Final Exam**	

Course Policies
University regulations apply to this course regarding class attendance, punctuality, exams, late submissions, absence with permission, penalties for cheating, and policies for assignments and projects, if any. Students should be aware of all those in addition to other rules and regulations stated and descried in the student handbook.

Course	**Applied Plant Biology**
Module 1	**Economic Importance of Plants and Applications**

Key Concepts	Economy, Organic agriculture, Medicinal Plants, Biofuels
Overview	Plants are very important in the lives of people throughout the world. People depend upon plants to satisfy such basic human needs as food, clothing, shelter, and health care. These needs are growing rapidly because of a growing world population, increasing incomes, and urbanization. Traditional application and usage of plants as part of the economic improvement to the developed and developing countries will be discussed. This would include the rapid increase or demand on organic agriculture, modern application of medicinal plants in the pharmacological industry, and planting special crops as a source of fuels.
Aim	Students will learn about the importance of plants to mankind and their applications.
Learning Outcomes	At the end of this module, students will be able to: - describe the importance of plants from an economical point view to humankind. - demonstrate the meaning, history, methods and economy of organic agriculture. - discuss the various types of medicinal plants and their applications. - illustrate applications and limitations of biofuel..
Units	6- Value of Plants 7- Organic Culture 8- Medicinal Plants 9- Biofuel
Readings	- Adrian Slater, A., Scott, N.W., and Flower, M.R. 2008. 2nd Edition. Plant Biotechnology, The Genetic Manipulation of Plants. Oxford University Press. - Simpson, B.B., Ogorzaly, M., and Beryl, S. 2001. 3rd Edition. Economic Botany: Plants in our World. McGraw-Hill (Boston)
Activity	- review
Module 2	**Traditional Methods of Plant Manipulation**
Key	Plant Breeding; Techniques and Applications

Concepts	
Overview	The aim of plant breeding is to produce new crop varieties that have maximum utility to growers in a region, to better serve the needs of the farmer, the processor, and the ultimate consumer. New varieties may have any or all of the following improvements: higher yield, more resistance to diseases and insects, maturity dates that fall into more-profitable market windows, and higher quality characteristics. Incorporation between plant breeding and genetic engineering methods would be discussed. Steps of plant breeding such as; collection of variation, selection, evaluation, release, multiplication, and distribution of the new variety will be raised. The use of tools such as molecular markers or DNA fingerprinting can map thousands of genes. This allows plant breeders to screen large populations of plants for those that possess the trait of interest. The screening is based on the presence or absence of a certain gene as determined by laboratory procedures, rather than on the visual identification of the expressed trait in the plant. The application of Marker Assisted Selection will be introduced. **Field trip could be arranged to one of the local Plant Breeding companies.**
Aim	Students will be introduced to the concept of plant breeding and its applications for crop improvement.
Learning Outcomes	At the end of this module, students will be able to: - Infer new techniques in plant breeding and propagation. - Evaluate the impact of plant breeding on crop improvement.
Units	9- Breeding Methods 10- Applications of Plant Breeding
Readings	- Adrian Slater, A., Scott, N.W., and Flower, M.R. 2008. 2nd Edition. Plant Biotechnology, The Genetic Manipulation of Plants. Oxford University Press. - Hartmann, H.T., Kester, D.E., Davies, F.T., Geneve, R. 2011. 8th Edition. Plant Propagation: Principles and Practices. Pearson/Benjamin Cummings, San Francisco, CA
Activity	Review

Module 3	Approaches of Plant Propagation
Key Concepts	Sexual, Asexual, Tissue Culture
Overview	In general, plants can be reproduced by two major mechanisms, sexual and asexual methods. Seeds are typically produced from sexual reproduction within a species, because genetic recombination has occurred. A plant grown from seeds may have different characteristics from its parents. Some species produce seeds that require special conditions to germinate. Plants have a number of mechanisms for asexual or vegetative reproduction. Some of these have been taken advantage of by horticulturists and gardeners to multiply or clone plants rapidly. Techniques for vegetative propagation include; cuttings, grafting and layering. Plant regeneration *in vitro* using growth medium under aseptic and regulated environmental conditions is extremely important and required to the production of genetically modified crops. The primary aim is therefore to produce, as easily and as quickly as possible, a large number of regenerable cells that are accessible to gene transfer. This module will consider some basic issues concerned with plant tissue culture *in vitro*, particularly as applied to plant transformation. It will also look at the basic culture types used for plant transformation and cover some of the techniques that can be used to regenerate whole transformed plants from transformed cells or tissue.
Aim	Students will learn the different methods used for plant propagation.
Learning Outcomes	At the end of this module, students will be able to:
Units	1- Seed Propagation 2- Types of Asexual Plant Propagation 3- Micropropagation
Readings	- Adrian Slater, A., Scott, N.W., and Flower, M.R. 2008. 2nd Edition. Plant Biotechnology, The Genetic Manipulation of Plants. Oxford University Press. - Hartmann, H.T., Kester, D.E., Davies, F.T., Geneve, R. 2011. 8th Edition. Plant Propagation: Principles and Practices. Pearson/Benjamin Cummings, San Francisco, CA.

Activity	Review
Module 4	**Plant Genetic Manipulation**
Key Concepts	Plant Transformation, Herbicide Resistance, Pest Resistance, Stress Tolerance, Molecular Farming, GM Acceptance
Overview	Plant Genetic engineering has become one of the most important molecular tools for crop improvement. Over the last decade, significant progress has been made in the development of new and efficient transformation methods in plants. Different methods used to transfer foreign gene(s) into plants will be presented. Several crops have been genetically modified to be resistant to non-selective herbicides. These transgenic crops contain genes that enable them to degrade the active ingredient in an herbicide, rendering it harmless. This eliminates weeds without risking their crops, thereby helping farmers to produce higher yields of their crops. Insect attack is a serious agricultural problem leading to yield losses and reduced product quality. Insects can cause damage both in the field and during storage in silos. *Bacillus thuringiensis*, or *Bt*, is a bacterium that has attracted much attention for its use in pest control. The soil bacterium produces a protein that is toxic to various herbivorous insects. DNA technology makes it possible to locate the gene that produces Bt proteins lethal to insects and transfer the gene into crop plants. The process will be depicted in this module. Plant abiotic stresses are external and nonliving factors that have harmful effects on plants. A nonliving factor must exert influence on the normal range of environmental variation to adversely and significantly affect the plant performance or the physiology of the organism. The most important abiotic stresses affecting crop plants are drought, salinity and alkalinity, floods or excess water, extreme temperatures, mineral toxicities and deficiencies, high or low pH, poor edaphic conditions and high winds causing rapid dehydration during seed germination. Genetically engineered crops resistant to selected abiotic stresses would be demonstrated in detalis.

	Protein-based biopharmaceuticals have become increasingly important due to a combination of their bioreactivity, specificity, safety and overall success rate. *Escherichia coli* , yeast and animal cells have traditionally been used as heterologous expression systems for production of pharmaceutical proteins. Plants have emerged as a promising alternative expression system for production of pharmaceutical proteins because they offer several potential advantages, including low production costs, ease of scale-up to commercial quantities of production and reduced risk of product contamination by mammalian viruses or toxins. Plants are already being used to produce antibodies, vaccines, growth factors and many other proteins of pharmaceutical importance. In this module, we will discuss the technological basis of molecular farming in plants. Benefits and risks of using genetically modified crops will be discussed in this module.
Aim	Students will be introduced to the application of plant genetic engineering towards crop improvement.
Learning Outcomes	At the end of this module, students will be able to: - Describe different technologies that enable the genetic manipulation of crop plants. - Describe in detail the development of herbicide and pest resistance. - Discuss in detail the development of disease resistance. - Evaluate advantages and disadvantages of genetically modified crops and understand their future prospects.
Units	1- Different Techniques of Plant Transformation. 2- Applications of Plant Genetic Manipulation of producing herbicide resistance, pest resistance, and stress tolerance. 3- Introduction to Molecular Farming. 4- Public Opinion of Genetically Modified Crops.
Readings	- Adrian Slater, A., Scott, N.W., and Flower, M.R. 2008. 2nd Edition. Plant Biotechnology, The Genetic Manipulation of Plants. Oxford University Press.
Activity	- review - discussion session initiating project work

Module 5	Climate Change Impacts on Crop Production
Key Concepts	Climate change, Crop Production, Food Security
Overview	Since the middle of the 19th century, there is an important body of evidence that shows that Earth has warmed. By the end of this century, the global mean temperature could be 1.8° to 4.0°C warmer than at the end of the previous century. Climate change can result from natural causes, from human activities through the emission of greenhouse gases such as carbon dioxide and methane, and from changes in land use. Thus, climate change is expected to bring warmer temperatures; changes to rainfall patterns; and increased frequency, and perhaps severity, of extreme weather. Hunger has multiple dimensions and causes, ranging from deficiencies in macro- and micro-nutrients, through short-term shocks on food access, to chronic shortages. Together, climate change and food security have multiple interrelated risks and uncertainties for societies and ecologies. Therefore, climate change has indirect impacts on crop productivity that could have consequences for food availability. The stability of whole food systems may be at risk under climate change because of short-term variability in supply. Consequences of climate change on plant production and food security will be thoroughly discussed.
Aim	Students will learn about the impact of climate change on plants and food security.
Learning Outcomes	At the end of this module, students will be able to: - Diagnose the impact of climate change on plant diversity, production and food security.
Units	7- Climate Change. 8- Global Food Security. 9- Future Prospects.
Readings	- Smith, T., Smith, R (2009): Elements of Ecology. 6th (or later) edition. Benjamin Cumming/Pearson. (chapters 16-19). - Tim Wheeler and Joachim von Braun (2013) Climate Change Impacts on

	Global Food Security. *Science* **341**, 508
Activity	

1. Course Specifics

Course Title	Science and Society
Course Number:	900171
Course Prerequisite(s)	None
Course Co-requisite(s)	None
Credit Hours	Lecture: 3 hrs
Lecture Days & Time	
Class Location	BB- S03
Course Instructor/s	Dr. Ahmed Al-Smadi
Syllabus Approved by:	
b. Academic Committee	
a. Department Chair	Prof. Adi Arida

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	E-mail Address
Ahmed Al-smadi	Assistant Prof.	SB -G37 Ext.5607	a.smadi@aum.edu.jo

3. Course Components

Resources:

- **Hands-out prepared by the instructor of the class.**
- **Text book:**

Title**:** Science is **Culture**
Author: Adam Bly
Publisher: Harper Collins

- **Website resources:**
  http://www.wwf.org.uk/what_we_do/tackling_climate_change/?pc=ANZ004002&ds_medium=cpc&gclid=COypysHCv8ACFVNutAodlgkArw&gclsrc=aw.ds

  http://practicalaction.org/climate-change?utm_source=S000&utm_medium=PPC&utm_campaign=C10105&gclid=CPCv1sTCv8ACFWTHtAodr0cAjg

  http://climate.nasa.gov/key_websites/

  http://teens.drugabuse.gov/

  http://www.drugabuse.gov/news-events/news-releases/2012/02/nida-creates-easy-to-read-website-drug-abuse

Course Description:

This course is an introduction to where science and technology meet society. It explores the advances of science and technology and their impact on society and social behavior. It discusses approaches to analyzing social dimensions of recent advances in areas such as nutracuticals, abusable drugs, and climate change. The course will be run primarily as group discussions with high expectations of student involvement. This course is divided into four main sections. The first section introduces the philosophy of science and how

science and society interrelates. The second section introduces the drug abuse effect on society and how science helps us to prevent drug abuse. The third section focus on nurtracuticals and herbal medicine and it is effect on society. The forth section concentrates on climate change by introducing the concept, way to adapt, how science can help to minimize the problem, environmental awareness and renewable energy. One of the main focuses of this course is the climate change and its effect on local and international society.
Students in this course will participate in developing an awareness source such as booklet, video, or poster for two main topic discuses in the course; the first will be focus on one of the following topics: drug abuse, nutracuticals, herbal medicine and radiation. The second will focus on climate change.
In addition, before the end of the course, students can address the effects of sciences on society by conducting group projects that address the needs of local communities and the capacity to utilize scientific knowledge to promote the health and well being of individual, community and society.

Course General Objectives:

The overreaching goals of this course are:

a) To develop an understanding of philosophy of science and how science and society interrelates.
b) Engage students in analysis of major contemporary controversies, enabling each student to acquire in-depth knowledge of one controversial issue concerning science and society of their choice.
c) To develop and practice skills relevant to preparing and delivering public presentations.
d) Raise awareness of the role of science and society to limit drug abuse, uses of nutracuticals, herbal medicine, radiation, and climate change and related adaptation.

Course content Learning Outcomes (ILOs)/Competencies:

Upon successful completion of this course, students will be able to:

1- **Discuss the various characteristics of science and understand the nature of the science.**
2- **Demonstrate awareness about how science and society interrelates.**
3- **Demonstrate awareness of types of Abusable drugs effect on society and how science can help to eliminate and prevent it.**

4- **Produce two educational materials (i.e. such as video, booklet, or poster) that focus on public awareness of drug abuse, nutracuticals, herbal medicine, radiation and climate change.**
5- **Discuss the different ways of climate change adaptation.**
6- **Discuss the aspects of environmental awareness to deal with climate changes.**
7- **Shows creative and critical thinking skills in carrying out oral presentations on topic of choice related to science and society.**

Teaching Methods:

The structure of this course is elaborated throughout lectures, classroom debates, assignments, exercises, homework and projects.

Assessment Instruments

	Mark
1st Assessment	15%
2nd Assessment	15%
Quizzes, participation, and Homework	10%
Final Project presentation	10%
Final Exam	50%
Total	100%

Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates
Week 1:	Introduction; Philosophy of science	

Week 2:	How science and society interrelate	
Week 3:	Drugs and Society	
Week 4:	Drugs and Society	
Week 5:	Herbal medicine and society/ Nutracuticals	
Week 6:	Radiations/ Mobile radiations	
Week 7:	Presentation of student's (first assessment)	
Week 8:	Presentation of student's (first assessment)	
Week 9:	Climate change/ Global warming: An introduction	
Week 10:	Climate change adaptation	
Week 11:	Renewable energy technology	
Week 12:	Environmental Awareness	
Week 13:	Presentation of student's (second assessment)	
Week 14:	Presentation of student's (second assessment)	
Week 15:	Students' final Presentation	
Week 16:	Students' final Presentation	

Radiations/ Mobile radiations

Course Policies

Lecture attendance is mandatory. If the rate of student absences, in a course unit, is greater than 15% (or 20% for student representing the University in sportive or cultural activities) of the completely accredited hours and the student has no acceptable justification, then this student is excluded from that course unit. If the Dean of the faculty accepts the justifications of absence, then this student is mentioned as withdrawn without refunding the registration fees.

Make-up exams, if existed, will be offered for valid reasons only with consent of the Dean. Make-up exams may be different from regular exams in content and format.

Mobiles are not tolerated in the class, and should be turned off during the lecture time.

Course Modules

Course	**Science and Society**
Module 1	Philosophy of Science/ How science and society interrelates
Key Concepts	Nature of science, limitations of science, history of the science, how science can serve society
Overview	This module gives an introduction to science and society. Questions to be addressed in this module include the following: what is the definition of science? What are the limitations of science? How science and society interrelates? How science can help to solve our society problems?
Aim	The overall aim of this module is to turn student able to understand the nature of science and how it is interrelates with society.
Learning Outcomes	At the end of this module students will be able to: • Identify the definition of science. • Discuss the limitations of science. • Understand how science and society interrelates. • Demonstrate knowledge of how science can serve society.
Readings	Instructor hand outs
Activity	**Overview** During this module a discussion between students will be raised about different aspects such as philosophy of science and how science interrelates. In addition, a student's "Role Play" will be conducted to discuss those issues.
Module 2	Drugs abuse
Key Concepts	Science and understanding of drug abuse, Drugs and brain, consequences

	of drug abuse, major Abusable drugs.
Overview	This module introduces the drug abuse. The module aims to answer the following questions: How Science Has Revolutionized the Understanding of Drug addiction? Why study drug abuse and addiction? Why is adolescence a critical time for preventing drug addiction? How do science-validated prevention programs work? What is the effect of drug abuse and addiction on different specific population? How do drugs work in the brain? Why are drugs more addictive than natural rewards? What are the medical consequences of drug addiction? What are the principles of effective addiction treatment? What are some effects of specific abused substances?
Aim	The over aim of this module is to introduce drug abuse and it is effect on society.in addition how science can help society to eliminate and prevent drug abuse.
Learning Outcomes	At the end of this module students will be able to : • Understand how science revolutionized our understanding of drug abuse. • Discuss different harmful effect of drug abuse. • Identify the ways to prevent drug abuse.

	• Identify different types of addicted drugs and it is effect.
Readings	. Instructor selected readings. . Selected YouTube videos
Activity	**Overview** During this module a discussion between students will be raised about different aspects such as science and drugs, harmful effect of drugs. In addition, a student's "Role Play" will be conducted to discuss those issues. Moreover, each student will have the chance to develop and present an educational material such as booklet, video, or poster related to drug abuse prevention.
Module 3	Nutracuticals/ Herbal Medicine
Key Concepts	Definition of nutracuticals, Benefits of using Nutraceuticals, Scientific evidence for the biological function of nutraceuticals, Classification of Nutraceuticals, diffention of herbal medicine, Remedies production,
Overview	This module aims to answer the following questions: What are Nutraceuticals? Where We Can Find Nutraceuticals? What is the Scientific evidence for the biological function of nutraceuticals? What are the Classification of Nutraceuticals? What are the he potential dangers of herbal remedies? How sciences affect the development of herbal medicine?
Aim	The over aim of this module is to introduce herbal medicine and nutracuticals and the role of science on it.
Learning Outcomes	At the end of this module students will be able to: • Define herbal medicine and Nutracuticals. • Identify different types of nutracuticals and herbal medicine. • Differentiate between the scientific and non-scientific uses of nutrients.
Readings	Selected hand outs by the instructor.

Activity	**Overview** During this module a discussion between students will be raised about different aspects such as types of nutracuticals and herbs. In addition, a student's "Role Play" will be conducted to discuss those issues. Moreover, each student will have the chance to develop and present an educational material such as booklet, video, or poster related to herbal medicine and nutracuticals.
Module 4	Radiation and mobile radiations
Key Concepts	Radiation risk and prevention
Overview	This module focus on radiation and it is effect on humans.
Aim	The module aims to answer the following questions: What are the different types of radiation? How Radiation can harm humans? What are the side effects of radiation? How can we protect our self from radiation?
Learning Outcomes	At the end of this module students will be able to: • Identify different types of radiation • Discuss the radiation effect on humans. • Identify the ways to protect ourselves from radiation.
Readings	Selected hand outs by instructor

Activity	**Overview** During this module a discussion between students will be raised about different aspects such as types of radiation and it is effect on humans. In addition, a student's "Role Play" will be conducted to discuss those issues. Moreover, each student will have the chance to develop and present an educational material such as booklet, video, or poster related to radiation safety.
Module 5	Climate Change
Key Concepts	Climate change/ Global warming, Climate change adaptation, Renewable energy technology, Environmental Awareness
Overview	This module introduces the issue of climate change and adaptation. In addition, discuss the renewable energy as one of the solutions that can help our world to eliminate climate changes. Moreover, it focuses on environmental awareness in relation to climate change.
Aim	The overall aim of this module is to introduce the climate change issue. The module aims to answer the following questions: What is the defection of climate change? Why climate change occurring? How science deals with climate change? What are the effects of climate change on society? What is the role of human being on climate change? What is the greenhouse effect?

	What are the Myths and facts related to climate change? What we can do to minimized climate change? What are the types of renewable energy available, and how it can be effective in minimizing climate change?
Learning Outcomes	At the end of this module students will be able to: • Identify the definition of climate change • Discuss and identify the methods of climate change adaptation. • Discuss how renewable energy can help to minimized climate change issue. • Demonstrate knowledge on the environmental awareness in relation to climate change • Develop an educational material related to climate change.
Readings	- Selected hand-outs by instructor . - CLIMATE CHANGE: IMPACTS, VULNERABILITIESAND ADAPTATION IN DEVELOPING COUNTRIES- United Nations Framework Convention on Climate Change (UNFCCC).
Activity	**Overview** During this module a discussion between students will be raised about different aspects such as causes of climate change, and action to be taken to minimize the effect of climate change. In addition, a student's "Role Play" will be conducted to discuss those issues. Moreover, each student will have the chance to develop and present an educational material such as booklet, video, or poster related to climate change

Faculty: Foreign Languages and Communication
Department: Department of English

Course Syllabus

Course Title: Social Ethics	**Course Number: 700141**
Course Prerequisite(s) and/or Co-Requisite(s):NA	**Credit Hours: three**
Lecture Days, and Timing:	**Course Prepared By:** **Wafa Khadra**
Course Approved By **a. Name of Academic Coordinator: Wafa Khadra** **b. Name of Department Committee Representative: Faculty of Arts** **c. Dean: Professor Issam Abu Salim**	

Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	Office Hours	E-mail Address
Wafa Khadra	Assistant Professor			W.khadra@aum.edu.jo

Course Description:

Social Ethics deals with some of the most challenging ethical issues in our contemporary world: abortion, euthanasia, the death penalty, torture and anti-terrorism, race, gender, world poverty, environmental ethics, climate change and animal rights. A variety of ethical approaches will be used to evaluate social and political issues in our current society for students to become consciously aware of their own moral traditions and others, and this will, naturally, enhance constructive critical thinking habits and reinforce students' values and issue relatedness.

Course Objectives:

The aim of this course is to enable students to:

- Identify and explain the relevant empirical considerations that may affect the ethical analysis of social, environment problems and climate change considered in this course

- Apply deontological, consequentialist and character-based frameworks to the analysis of the specific social, environment problems and climate change
- Develop and present arguments in support of your own position on the specific social, environment problems and climate change

- Critically evaluate arguments that have been advanced in the philosophical narrative on the social, environment problems and climate change

- Improve ability to clearly and concisely summarize, analyze and debate others' arguments.
- Learn several historically and philosophically significant ethical positions.
- Study competing arguments in several areas of contemporary ethical interest, matters and controversial issues.
- Initiate a project that deals with social, environment problems and climate change to bring about positive change

The aim of this course is to further develop:

- **How to assess arguments in social, environmental ethics and climate change.**
- **Students' ability to clearly and concisely summarize others' arguments.**
- **Knowledge on several historical and philosophical social and environmental ethics with special focus on climate change ethical positions.**
- **Debates in several areas of contemporary various positionality on social, environmental ethics and climate change.**
- **knowledge, consciousness and relatedness toward environmental issues and climate change.**
- **Diagnosis of environmental challenges and threats**
- **Problem solving of polemic ethical matters high among which is the climate change**

Course Components:

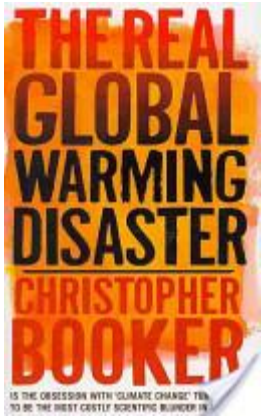
Text book:

Social Ethics (8TH 11 Edition) by Thomas Mappes - Powell's Books

"Social Ethics (8TH 11 Edition) by Thomas Mappes: With an assortment of readings and perspectives from some of the most respected thinkers of our time, Social Ethics: Morality and Social Policy provides a balanced, engaging introduction to today's most pressing social and moral problems. ..

With an assortment of readings and perspectives from some of the most respected thinkers of our time, *Social Ethics: Morality and Social Policy* provides a balanced, engaging introduction to today's most pressing social and moral problems. This highly popular anthology illuminates the issues at the heart of each contemporary problem and encourages critical, fair-minded examination of varying viewpoints—all presented in the words of those who embrace them. Helpful editorial features include substantial chapter introductions, a summary preceding each selection, discussion questions, and bibliographies for further reading. "

- **The Real Global Warming Disaster:** Is the Obsession with 'climate Change' Turning Out to be the Most Costly Scientific Blunder in History?



Christopher Booker

A&C Black, 2010 - Political Science - 384 pages

6 Reviews

This original book considers one of the most extraordinary scientific and political stories of our time: how in the 1980s a handful of scientists came to believe that mankind faced catastrophe from runaway global warming, and how today this has persuaded politicians to land us with what promises to be the biggest bill in history.

Christopher Booker interweaves the science of global warming with that of its growing political consequences, showing how just when the politicians are threatening to change our Western way of life beyond recognition, the scientific evidence behind the global warming theory is being challenged like never before.

The book exposes the myth that the global warming theory is supported by a 'consensus of the world's top climate scientists'. It shows how the UN's Intergovernmental Panel on Climate Change is run by a small group of 'global warming' zealots, who have repeatedly rigged evidence to support their theory. But the politicians, pushed by the media, have so fallen for its propaganda that, short of dramatic change, our Western world now faces an unprecedented disaster.

More »

- Hinman, Contemporary Moral Issues, 3ed. ed.

Three full-length videos will also be shown:

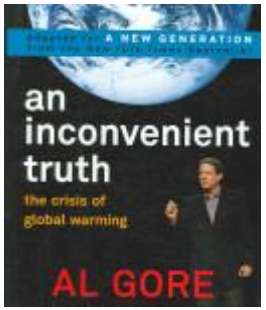
- Bill Moyers, A Death of One's Own, Vol. 3: On Our Own Terms (2000)
- Gattaca
- Dead Man Walking
- Inconvenient Truth Documentary

The movies are available in the free movies of Open Culture link: http://www.openculture.com/freemoviesonline

In addition, links to a number of on-line (free) videos will be given on the class schedule.

Course References:

An inconvenient truth: the crisis of global warming



Albert Gore
Viking, Apr 10, 2007 - Juvenile Nonfiction - 191 pages
14 Reviews
This young readers' version of the recent documentary film's companion adult volume cuts the page count by about a third but preserves the original's cogent message and many of its striking visuals. After explaining that his interest in the environment predates even his mother's reading of Silent Spring aloud to him as a teenager, Gore proceeds to document steeply rising carbon dioxide levels in our atmosphere, and then to link that to accelerating changes in temperature and precipitation patterns worldwide. Using easy-to-grasp

Links on Web Research, Supplemental Soft Sources:

http://www.openculture.com/freeonlinecourses

http://plato.stanford.edu/search/searcher.py

http://www.openculture.com/freemoviesonline

http://www.youtube.com/view_play_list?p=40E11D5C66CAC48C

http://itunes.apple.com/itunes-u/global-geopolitics/id384240471#ls=1

http://itunes.apple.com/itunes-u/global-geopolitics/id384240471#ls=1

http://www.youtube.com/user/UCLACourses#g/c/10D71A7139FD2D0D

http://itunes.apple.com/itunes-u/legal-studies-109-001-fall/id354824633

http://www.youtube.com/view_play_list?p=8DA9DAD111EAAD28

http://www.youtube.com/view_play_list?p=214AD3BA0B8D3FBA

http://www.youtube.com/user/YaleCourses#g/c/84DCD72C5B5DC403

http://ocw.dixie.edu/humanities/social-ethics/powerpoints/powerpoint-presentations

Teaching Methods: (Examples; Use the Applicable Ones)

- Simulations
- Negotiation Exercises
- Small Group Exercises
- Team Building Progress
- Presentation
- Seminar Discussion

- Lecturing
- Demonstration
- Workshops/Assignments

Learning Outcomes:

- **Knowledge and understanding**:

From the assigned and recommended readings and the classroom discussions, you will learn a lot about the specific cultural issues we consider this semester which will help you:

- Demonstrate knowledge and understanding of the different social, environmental ethics and climate change.
- Understand the basic concepts and terminology of contemporary social, environmental ethical issues with special focus on climate change.
- Demonstrate knowledge of the key paradigms of debate and discussion on the social, environmental issues and climate change
- Develop the competence of effective and fast discussion and debate on social, environmental ethics and climate change.

- **Cognitive skills (thinking and analysis):**

- Analyze and debate topics in texts from different positionality on social, environmental ethics and climate change.

- Structure ideas and arguments on social, environmental ethics and climate change, both orally and in writing, in a sustained and logical fashion, and support them with relevant examples.

- Generate and articulate personal responses to various contentious social , environmental matters and climate change, and explain the premises and assumptions underlying such personal responses.

- Differentiate between opinions, intentions, and facts.

- Detect and recognize the style and range of the argument used depending upon the social and cultural context in which it is used.

- **Communication skills (personal and academic):**

Throughout the semester, you will be asked to develop your own position on these issues, showing a critical awareness of what we have learned in class while at the same time presenting your own view on the issues.

Throughout the semester, you will be asked to develop your own position on these issues, showing a critical awareness of what we have learned in class while at the same time presenting your own view on the issues.

Practical and subject specific skills (Transferable Skills):

- Note significant details in various texts

- Cite evidence to prove a point
- Compare and contrast different point of views of a reading text
- Read for enjoyment
- Expand vocabulary
- Cite evidence to prove a point.
- Write resume, cover letter, proposals, etc.
- Moderate table topics
- Perform short speeches
- Give power-point presentation
- Debate contemporary issues highlighting their controversies and complexities
- Build a convincing argument in line with emerging contemporary issues

Assessment Instruments: (For Example)

Allocation of Marks	
Assessment Instruments	**Mark**
Midterm examination	**20%**
Presentations, Participation, Extended	**20%**

Essays.	
Final Exam (written unseen exam)	**30%**
Project	**30%**
Total	**100%**

Documentation and Academic Honesty (Pledge of Honor):

Avoiding plagiarism and cheating:

"The University's definition is that cheating is defined as any illegitimate behavior designed to deceive those setting, administering and marking the assessment.
Cheating can take a number of forms, including:

- The use of unauthorized books, notes, electronic aids or other materials in an examination;
- Obtaining an examination paper ahead of its authorized release;
- Collusion, i.e. the representation of another's work or ideas as one's own without appropriate acknowledgement or referencing, where the owner of the work knows of the situation and both work towards the deceit of a third party (while in plagiarism the owner of the work does not knowingly allow the use of his or her work);

- Acting dishonestly in any way including fabrication of data, whether before, during or after an examination or other assessment so as to either obtain or offer to others an unfair advantage in that examination or assessment; “

Plagiarism can take a number of forms, including:

> “Plagiarism, i.e. the act of representing another's work or ideas as one's own without appropriate acknowledgement or referencing. There are three main types of plagiarism, which could occur within all modes of assessment (including examination):
>
> - Direct copying of text or images from a book, article, essay, computer program, handout, thesis, web page or other source without proper acknowledgement.
> - Claiming individual ideas derived from a book, article etc. as one's own, and incorporating them into one's work without acknowledging the source of these ideas.
> - Overly depending on the work of one or more others without proper acknowledgement of the source, by constructing an essay, project etc. by extracting large sections of text from another source, and merely linking these together with a few of one's own sentences or using 'essay bank' material.

To avoid plagiarism, students are expected to keep systematic written notes of the sources they use at the time they refer to the sources. Without such notes, it is almost impossible to avoid committing plagiarism.

Penalty for Cheating, Plagiarism, and Mobile Usage inside rooms:

The University has strict rules and harsh penalties (including expulsion from the university) about cheating, plagiarism and mobile usage.”

<u>Attendance policy:</u>

Lecture attendance is mandatory. If the rate of student absences, in a course unit, is greater than 15% (or 20% for student representing the University in sportive or cultural activities) of the completely accredited hours and the student has no acceptable justification, then this student is excluded from that course unit. If the Dean of the faculty accepts the justifications of absence, then this student is mentioned as withdrawn without refunding the registration fees.
Make-up exams, if existed, will be offered for valid reasons only with consent of the Dean. Make-up exams may be different from regular exams in content and format.

Course Academic Calendar:

Week	Basic and support material to be covered	Resources	Homework/reports and their due dates
1	Climate Change and	• *The Real Global Warming Disaster: Is the Obsession with 'climate Change' Turning Out to be the Most Costly Scientific Blunder in*	

	Water Shortage	*History?* http://www.youtube.com/watch?v=n1gsyhuHGgc&feature=related http://www.youtube.com/watch?v=fBYfEahqpTk http://www.youtube.com/watch?feature=endscreen&v=8uAZWEnVgyU&NR=1 http://www.youtube.com/watch?v=14wiicJ9D6I https://www.goethe.de/ins/jo/amm/prj/ema/far/whj/enindex.htm http://news.bbc.co.uk/2/hi/middle_east/8292228.stm	
2	Climate Change and Environmental Ethics and Sustainability	http://plato.stanford.edu/entries/ethics-environmental/ The link for Story of Stuff http://www.storyofstuff.org/movies-all/story-of-stuff/	

		An inconvenient truth: the crisis of global warming	
3	Environmental Ethics and Sustainability	http://plato.stanford.edu/entries/ethics-environmental/ The link for Story of Stuff http://www.storyofstuff.org/movies-all/story-of-stuff/	
4	Individual Property: Moral Personal Conviction Abortion and Contraception Euthanasia Death Penalty	http://plato.stanford.edu/entries/euthanasia-voluntary/ http://www.linacre.org/newsle~1.htm http://www.equip.org/articles/euthanasia-arguments	

		http://www.theuniversitystandard.com/index.php?option=com_content&task=view&id=93&Itemid=57 http://www.kobi5.com/component/zoo/item/birth-control-debate.html http://bangordailynews.com/2012/03/02/living/women-show-strength-in-contraception-debate/?ref=latest http://www.usnews.com/news/politics/articles/2012/03/03/obama-recasts-birth-control-debate-on-own-terms http://www.lexingtonprosecutor.com/death_penalty_debate.htm http://en.wikipedia.org/wiki/Capital_punishment_debate http://plato.stanford.edu/entries/ethics-environmental/ An interview with Annie Leonard the creator of the story of stuffwith Stephen Colbert in the following hyper link: http://www.storyofstuff.org/ Terry Schiavo and stopping the feeding tube http://www.youtube.com/watch?v=KEdhe7xLD3E The link for Euthanasia http://en.wikipedia.org/wiki/Euthanasia A song to argue against it http://www.youtube.com/watch?v=CqpDw15sYcI One argument on Euthanasia is put in the following	

		song: http://www.youtube.com/watch?v=_mWW2CpkaxA&feature=related The religious argument against Euthanasia http://www.youtube.com/watch?v=LcOXAjH3F_A&feature=related	
5	Individual Property: Moral Personal Conviction Abortion and Contraception Euthanasia Death Penalty	http://plato.stanford.edu/entries/euthanasia-voluntary/ http://www.linacre.org/newsle~1.htm http://www.equip.org/articles/euthanasia-arguments http://www.theuniversitystandard.com/index.php?option=com_content&task=view&id=93&Itemid=57 http://www.kobi5.com/component/zoo/item/birth-control-debate.html http://bangordailynews.com/2012/03/02/living/women-show-strength-in-contraception-debate/?ref=latest	

		http://www.usnews.com/news/politics/articles/2012/03/03/obama-recasts-birth-control-debate-on-own-terms http://www.lexingtonprosecutor.com/death_penalty_debate.htm http://en.wikipedia.org/wiki/Capital_punishment_debate http://plato.stanford.edu/entries/ethics-environmental/ An interview with Annie Leonard the creator of the story of stuffwith Stephen Colbert in the following hyper link: http://www.storyofstuff.org/ Terry Schiavo and stopping the feeding tube http://www.youtube.com/watch?v=KEdhe7xLD3E The link for Euthanasia http://en.wikipedia.org/wiki/Euthanasia A song to argue against it http://www.youtube.com/watch?v=CqpDw15sYcI One argument on Euthanasia is put in the following song: http://www.youtube.com/watch?v=_mWW2CpkaxA&feature=related The religious argument against Euthanasia http://www.youtube.com/watch?v=LcOXAjH3F_A&feature=related	
6	Individual Property:	http://plato.stanford.edu/entries/euthanasia-voluntary/	

	Moral Personal Conviction Abortion and Contraception Euthanasia Death Penalty	http://www.linacre.org/newsle~1.htm http://www.equip.org/articles/euthanasia-arguments http://www.theuniversitystandard.com/index.php?option=com_content&task=view&id=93&Itemid=57 http://www.kobi5.com/component/zoo/item/birth-control-debate.html http://bangordailynews.com/2012/03/02/living/women-show-strength-in-contraception-debate/?ref=latest http://www.usnews.com/news/politics/articles/2012/03/03/obama-recasts-birth-control-debate-on-own-terms http://www.lexingtonprosecutor.com/death_penalty_debate.htm http://en.wikipedia.org/wiki/Capital_punishment_debate http://plato.stanford.edu/entries/ethics-environmental/ An interview with Annie Leonard the creator of the story of stuffwith Stephen Colbert in the following hyper link:	

		http://www.storyofstuff.org/ Terry Schiavo and stopping the feeding tube http://www.youtube.com/watch?v=KEdhe7xLD3E The link for Euthanasia http://en.wikipedia.org/wiki/Euthanasia A song to argue against it http://www.youtube.com/watch?v=CqpDw15sYcI One argument on Euthanasia is put in the following song: http://www.youtube.com/watch?v=_mWW2CpkaxA&feature=related The religious argument against Euthanasia http://www.youtube.com/watch?v=LcOXAjH3F_A&feature=related	
7	Individual Property: Moral Personal Conviction Abortion and Contraception Euthanasia Death Penalty	http://plato.stanford.edu/entries/euthanasia-voluntary/ http://www.linacre.org/newsle~1.htm http://www.equip.org/articles/euthanasia-arguments http://www.theuniversitystandard.com/index.php?option=com_content&task=view&id=93&Itemid=57 http://www.kobi5.com/component/zoo/item/birth-control-debate.html	

		http://bangordailynews.com/2012/03/02/living/women-show-strength-in-contraception-debate/?ref=latest http://www.usnews.com/news/politics/articles/2012/03/03/obama-recasts-birth-control-debate-on-own-terms http://www.lexingtonprosecutor.com/death_penalty_debate.htm http://en.wikipedia.org/wiki/Capital_punishment_debate http://plato.stanford.edu/entries/ethics-environmental/ An interview with Annie Leonard the creator of the story of stuffwith Stephen Colbert in the following hyper link: http://www.storyofstuff.org/ Terry Schiavo and stopping the feeding tube http://www.youtube.com/watch?v=KEdhe7xLD3E The link for Euthanasia http://en.wikipedia.org/wiki/Euthanasia A song to argue against it http://www.youtube.com/watch?v=CqpDw15sYcI One argument on Euthanasia is put in the following song: http://www.youtube.com/watch?v=_mWW2CpkaxA&feature=related The religious argument against Euthanasia http://www.youtube.com/watch?v=LcOXAjH3F_A&feature=related	

8	Freedom of Expression and Hate Speech	http://abcnews.go.com/Health/video/hate-speech-debate-heads-supreme-court-11833455 http://debatepedia.idebate.org/en/index.php/Debate: THBT hate speech should be a crime http://freespeechdebate.com/en/ http://debatepedia.idebate.org/en/index.php/Debate:Freedom of Speech, Restrictions on	
9	Terrorism and Freedom Fighting	http://i-p-o.org/int-terrorism.htm http://i-p-o.org/int-terrorism.htm	
10	Terrorism and Freedom Fighting	http://i-p-o.org/int-terrorism.htm http://i-p-o.org/int-terrorism.htm	
11	Immigration:Closed and Open Borders.	http://plato.stanford.edu/entries/immigration/	

	Preserving Culture or Cosmopolitanism	http://www.immigrationdebate.com/ http://debatepedia.idebate.org/en/index.php/Debate: Multiculturalism vs. assimilation http://debatepedia.idebate.org/en/index.php/Argument: Assimilation does not mean abandoning cultural distinctions	
12	Immigration:Clossed and Open Borders. Preserving Culture or Cosmopolitanism	http://plato.stanford.edu/entries/immigration/ http://www.immigrationdebate.com/ http://debatepedia.idebate.org/en/index.php/Debate: Multiculturalism vs. assimilation http://debatepedia.idebate.org/en/index.php/Argument: Assimilation does not mean abandoning cultural distinctions	
13	Immigration:Clossed and Open Borders. Preserving Culture or	http://plato.stanford.edu/entries/immigration/	

	Cosmopolitanism	http://www.immigrationdebate.com/ http://debatepedia.idebate.org/en/index.php/Debate: Multiculturalism vs. assimilation http://debatepedia.idebate.org/en/index.php/Argument: Assimilation does not mean abandoning cultural distinctions	
14	**Gender Equality**	http://en.wikipedia.org/wiki/Gender_equality http://blogs.worldbank.org/africacan/is-this-a-womans-world-gender-equality-in-tanzania http://blogs.utexas.edu/provost/ http://genderindex.org/country/jordan The movie My Name is Osama: http://www.openculture.com/freemoviesonline	
15	**Group project presentation**		
16	**Group project presentation**		

Assessment Tasks in Detail

- Participation, Presentation and Extended Essays will be worth 20% of the semester grade

- Students are expected to attend all regularly scheduled classes. In this course you are permitted 4 unexcused absences (absences not caused by illness). If you have more than four unexcused absences your grade for the course will be lowered by one "mark" for each additional unexcused absence.
- Presentations: students are asked to choose a topic from the course syllabus and give a 15- minute presentation of the main themes, followed by 10 minutes of questions and answers. The presentation is worth 10% of the semester grade.
- Extended Essays of a maximum of 800 words each worth 10% of the semester grade; words of the essay in a standard essay format that conforms to the MLA format using 12 point Times New Roman font with 2.5 cm margins is required.

The essay must have at least 3 sources other than the assigned and recommended readings. Students are expected to cite and to discuss critically all assigned and recommended readings related to the paper. Essays that are more than 800 words will be penalized 5 points. Essays have to be handed in person at the beginning of a scheduled class. Essays submitted after the deadline will be penalized 5 points for each day of delay

- Project: students are expected to work on a project relevant to the subject matter of the course. The project can be pair or group work. Students are asked to give a 15- minute presentation of the project. The project is worth 30% of the semester grade

- Midterm exam: A 55- minute, in-class exam consisting mainly is worth 20% of the semester grade
-

- A final exam is worth 30% of the semester grade. The exam consists of short essay questions and attempts to cover the study material in proportion to class time (not number of pages in assigned readings). However, many of the questions will require drawing on knowledge from a variety of topics covered in different classes

1. Course Specifics

Course Title **Course Number:**	**Marketing Communication / 504213**

Course Prerequisite(s)	**504101**
Course Co-requisite(s)	
Credit Hours	**3 CH**
Lecture Days & Time	
Class Location	
Course Instructor/s	**Dr. Bushra Mahadin**
Syllabus Approved by:	
b. Academic Committee	
a. Department Chair	

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	Office Hours	E-mail Address
Dr.Bushra Mahadin	Assistant Professor	Room BA- F-25 Ext.5405		b.mahadin@aum.edu.jo

3. Course Components

Resources:

- **Text book:** "Advertising and Promotion: An Integrated Marketing Communications Perspective", Belch & Belch, Global edition.
- **Other resources :** Robert Cox, "Environmental Communication and the Public Sphere" , 3rd edition (2012)
-

Course Description:

Marketing Communications will provide students who have a basic fluency in marketing with an opportunity to explore all aspects of advertising and promotion in depth and detail, with an emphasis on IMC. It includes very comprehensive coverage of agency issues and creative work and how it is related to the IMC mix. In order to best communicate with consumers, advertisers must utilize a myriad of tools (advertising, public relations, direct marketing, interactive/Internet marketing, sales promotion, and personal selling). This course also explores environmental

communication as an area of growing interest within the communication discipline; it aims to provide an overview of its theoretical approaches, research literature, and practical applications. The course will also tackle the issues of the communication and public forums that are used to address environmental controversies in the U.S. and other nations, and the influence of language on decisions to protect wilderness, health, or the global climate.

Course Objectives:

Essentially, the course seeks to attain the following objectives:

- To give you an understanding of integrated marketing communications, traditional promotional tools, and new media options such as advertising on the World Wide Web.
- To show how consumer behavior and marketing communications theories can be used to design effective promotional strategies
- To give you hands on experience preparing an integrated marketing communications plan.
- To Explain the social construction of nature, and human relationships with nature, through discourse, rhetoric, and communication practices
- To clarify communication about environmental issues in organizational, mass media, political, and international contexts
- To give you an understanding environmental risk communication

Course Outcomes:

The following outcomes are expected from this course:

- **Knowledge and understanding:** Understand how marketing communication concepts and functions can be used in organizations.(course material and guest speaker)
- **Cognitive skills (thinking and analysis):** Apply key terms and information as business tools and modern thoughts. (assignments)
- **Communication skills (personal and academic):** Use marketing skills, cases, group presentation to improve better way of communication and networking.(case analysis and presentation)
- **Practical and subject specific skills (Skills):** Explore the importance of marketing communication mix and planning in changing the way of reaching customers and linking between supply and demand sides.

Teaching Methods:

- This course is based on lectures that are given in English. Lecture sessions will be delivered using power points slides, whiteboard, and visual aids (videos & pictures). Presentations will focus on theoretical issues and real-life applications. Students should prepare for each lecture by:
    - Reading the nominated chapters from the recommended texts.
    - Reading the nominated case studies and working papers.
    - Reading any recommended material by the lecturer.
    - A guest lecturer is welcomed every semester to talk about some real life time aspect of marketing.

- A group presentation is required by students to present and solve a marketing case. Working in groups during this course will be valuable experience for your working life ahead.
- Case Presentation is necessary at the final two weeks of the semester.
- Students are strongly advised to participate during the lectures.
- A textbook is a must for students to read topics and understand this course.
- Course attendance is compulsory throughout the semester.

Assessment Instruments

	Mark
First Exam	15%
Second Exam	15%
Quizzes, Homework and Participation	10%
Project	10%
Final Exam	50%
Total	100%

Course Academic Calendar

Topics	Basic and support material to be covered	Resources
1	▪ **Introduction to The Course** An introduction to integrated marketing communication	**Syllabus Chapter 1 (Belch & Belch)**

2	The role of IMC in the Marketing Process	**Chapter 2**
4	The study of Environmental Communication	**Chapter 2 (Cox)**
3	The communication Process	**Chapter 5**
First Exam		
4	Source, Message & channel factors.	**Chapter 6**
5	Social–Symbolic Constructions of Environment	**Chapter 3 (Cox)**
5	Establishing Objectives & budgeting for the promotional program	**Chapter 7**
6	Media planning and strategy	**Chapter 10**
Second Exam		
7	News Media and Environmental Journalism	**Chapter 6(Cox)**
8	Social Media and the Environment Online	**Chapter 7 (Cox)**
9	International Advertising and promotion	**Chapter 19**
10	Evaluation of Media Tools	**Handouts /Chapter 11-17**
The last two weeks will be dedicated for student group presentation of cases, and revision.		

Course Policies
University regulations apply to this course regarding class attendance, punctuality, exams, late submissions, absence with permission, penalties for cheating, and policies for assignments and projects, if any. Students should be aware of all those in addition to other rules and regulations stated and descried in the student handbook.

Course modules

Course	**Marketing Communication**

Module 1	Introduction to Integrated Marketing Communication
Key Concepts	Marketing, The promotional mix, The IMC process, Marketing strategy and analysis, the target marketing process.
Overview	The purpose of this opening module is to provide the student with an overview of the field of advertising and promotion and its role in the marketing process. We introduce the concept of integrated marketing communications (IMC), its evolution, and examine how various marketing and promotional elements must be coordinated to communicate effectively. We also discuss the reasons for the increasing importance of the IMC perspective in planning and executing advertising and promotional programs. Marketers understand the value of strategically integrating the various communication functions rather than having them operate autonomously. The move to integrated marketing communications also reflects an adaptation by marketers to a changing environment, particularly with respect to consumers, technology, and media. The various elements of the promotional mix are introduced in this module along with a brief discussion of these basic tools of IMC. We discuss how many companies are taking an audience contact or touch point perspective in developing their IMC programs and consider four basic categories of touch points. This module also examines the various tasks and responsibilities involved in advertising and promotion management and a model of the integrated marketing communications planning process is presented.
Aim	1. To examine the marketing communication function and the growing importance advertising and other promotional elements play in the marketing programs of domestic and foreign companies. 2. To introduce the concept of integrated marketing communications (IMC) and consider how it has evolved. 3. To examine the reasons for the increasing importance of the IMC perspective in planning and executing advertising and promotional programs.

	4. To introduce the various elements of the promotional mix and consider their role in an IMC program. 5. To examine the various types of contact points through which marketers communicate with their target audiences. 6. To examine how various marketing and promotional elements must be coordinated to communicate effectively. 7. To introduce a model of the IMC planning process and examine the steps in developing a marketing communications program.
Learning Outcomes	At the end of this module, students will be able to - Explain the definition of marketing - Explain the definition of the IMC and its tools - Define the promotional mix - Explain the process of target marketing
Units	10- An introduction to integrated marketing communication 11- The role of IMC in the Marketing Process
Readings	"Advertising and Promotion: An Integrated Marketing Communications Perspective", Belch & Belch, Global edition. (chapters 1,2)
Module 2	**Conceptual and Historical Contexts**
Key Concepts	The Field of Environmental Communication, Nature, Communication, and the Public Sphere, Diverse Voices in a "Green" Public Sphere
Units	Study and Practice of Environmental Communication
Readings	• Robert Cox, "Environmental Communication and the Public Sphere" , 3rd edition (2012) (chapter 2).
Module 3	**Analyzing the Communication Process**
Key Concepts	The basic communication model, source, message, encoding, decoding, feedback, message structure, message appeals, the persuasion matrix.
Overview	The purpose of this module is to examine the communication process by introducing the student to the fundamentals of communication and examining

	various models and perspectives of how consumers respond to advertising messages. A basic model of communication developed by Schram is presented which introduces the controllable elements of the communications process—source, message, channel, and receiver. Source, message, and channel factors are discussed in Chapter 6 and the remainder of this module is devoted to examining the target audience or receiver and the process by which consumers respond to advertising and other promotional messages. The response process is analyzed in terms of traditional response hierarchy models as well as alternative response models. Attention is given to comparing alternative response models such as the standard learning versus low involvement models.
Aim	1. To understand the basic elements of the communications process and the role of Communications in marketing. 2. To examine various models of the communication process. 3. To analyze the response process of receivers of marketing communications including alternative response hierarchies and their implications for promotional planning and strategy. 4. To examine the nature of consumers' cognitive processing of marketing communications. 5. To examine considerations involved in the selecting a source or communicator of a promotional message. 6. To examine different types of message structures and appeals that can be used to develop a promotional message. 7. To consider how the channel or medium used to deliver a promotional message influences the communication process.
Learning Outcomes	Students should be able to explain the key terms and display their understanding by presenting real world cases (promotional campaigns).
Units	- The communication process

	- Source, message and channel factors
Readings	"Advertising and Promotion: An Integrated Marketing Communications Perspective", Belch & Belch, Global edition. (chapters 5,6)
Activity	discussion session initiating project work
Module 4	**Conceptual and Historical Contexts**
Key Concepts	Terministic Screens and Naming , Constructing an Environmental Problem, Rhetorical Perspective, Rhetorical Tropes and Genres Communication Frames, Dominant and Critical Discourses, Visual Rhetorics: Portraying Nature.
Aim	1. to understand the use of terministic screens and naming 2. to understand the construction of environmental issues as problems 3. To describe a rhetorical perspective on environmental communication using three dimensions (1) Rhetorical tropes and genres (2) Communication frames (3) Dominant and critical discourses 4. To explain visual rhetoric, the ways in which visual images (re)present natureand how to Visualize environmental problems
Learning Outcomes	Being able to explain the pervious terms and presenting examples from real world cases.
Units	Social–Symbolic Constructions of Environment
Readings	Robert Cox, "Environmental Communication and the Public Sphere" , 3rd edition (2012) (chapter 3)
Module 5	**Establishing Objectives, Budgeting and Developing the Integrated Marketing Communication Program.**
Key Concepts	Marketing objectives, communication objectives, sales oriented objectives, budget allocation, the media mix, target market coverage, geographic coverage, scheduling, reach, frequency, creative aspects and mood.

Overview	This module focuses on the process of setting objectives and budgeting for the IMC program. The major emphasis is on determining advertising objectives as it is often the lead element in the promotional mix, particularly in consumer products marketing. It stresses the value and importance of setting specific advertising objectives and the role they play in guiding decisions and evaluating performance. It also focuses on the importance of knowing what to expect from advertising and the differences between sales versus communication objectives. The module then presents students with an understanding of the advertising and promotions budgeting process. And theories underlying budgeting decisions and examines the various approaches to budgeting. This module also introduces the concepts involved in media planning. A number of problems associated with the planning process are discussed. The role and purpose of the media plan follows with a presentation of the steps required in developing this plan. After an in-depth discussion of the elements of the media plan.
Aim	1. To recognize the importance and value of setting specific objectives for advertising and promotion. 2. To understand the role of objectives in the IMC planning process and the relationship of promotional objectives to marketing objectives. 3. To know the differences between sales and communication objectives and issues regarding the use of each. 4. To recognize some problems marketers encounter in setting objectives for their IMC programs. 5. To understand the process of budgeting for IMC.

	6. To know various methods of budget setting. 7. To understand the key terminology necessary in media planning. 8. To know how a media plan is developed. 9. To know what constitutes media objectives. 10. To know the process of developing and implementing media strategies. 11. To be familiar with various characteristics of media.
Learning Outcomes	Students should be able to explain the key terms and display their understanding by presenting real world cases (developing a promotional plan and campaign for a local company).
Units	- Establishing objectives and budgeting for the promotional program - Media planning and strategy
Readings	"Advertising and Promotion: An Integrated Marketing Communications Perspective", Belch & Belch, Global edition. (chapters 7,10)
Module 6	**Media and the Environment**
Key Concepts	Growth and Nature of Environmental News, News Production and the Environment, Climate Change in the News, Media Effects Challenges to Traditional (Environmental) News Media, Environmental Journalism Migrates Online, Social Media and the Environment, Social Media and Environmental Advocacy.
Units	News Media and Environmental Journalism Social Media and the Environment Online
Readings	Robert Cox, "Environmental Communication and the Public Sphere" , 3rd edition (2012) (chapter 6,7).
Module 7	**Special Topics and Perspectives**

Key Concepts	The international environment, the economic, demographic, cultural, political and legal environments, Global advertising, localized advertising.
Overview	The purpose of this final module is to evaluate the social, ethical, and economic aspects of advertising. Advertising is a very powerful and influential force in our society, and this course would not be complete without considering the various perspectives and criticisms regarding its social and economic effects. The first half focuses on the various criticisms of advertising from an ethical and societal perspective. Attention is then given to appraising the effects of advertising on the economy including its effect on consumer choice, competition, and product costs and prices. Perspectives regarding the economic effects of advertising are summarized by considering two principal models or schools of thought: the Advertising = Market Power and Advertising = Information perspectives. It should be noted that the primary focus in this chapter is on social and economic aspects of advertising, as this is the promotional mix variable that is the subject of the most concern, controversy, and regulation.
Aim	1. To consider various perspectives concerning the ethical aspects of advertising and promotion. 2. To consider various perspectives concerning the social aspects of advertising and promotion. 3. To examine and evaluate the social criticisms of advertising. 4. To examine the economic role of advertising and its effects on consumer choice, competition, and product costs and prices.
Learning Outcomes	Students should be able to explain the key terms and display their understanding by presenting real world cases (videos and promotions from around the world).
Units	International Advertising and promotion.
Readings	"Advertising and Promotion: An Integrated Marketing Communications

	Perspective", Belch & Belch, Global edition. (chapter 20)

1. Course Specifics

Course Title	**Marketing Channels & Logistics**
Course Number:	**0504214**
Course Prerequisite(s)	**0504101**
Course Co-requisite(s)	**-**
Credit Hours	**Lecture: 3 CH**
Lecture Days & Time	
Class Location	
Course Instructor/s	**Dr. Luai Jraisat**
Syllabus Approved by:	
b. Academic Committee	
a. Department Chair	

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	Office Hours	E-mail Address
Dr.Luai Jraisat	Ass.Professor	SB-F9		L.Jraisat@aum.edu.jo

3. Course Components

Resources:

- **Text book:**

Essential Reading:

Grant, D.B., Lambert, D.M., Stock, J.R., Ellram, L.M. (2011) Fundamentals of Logistics Management, European Edition, McGraw-Hill

Recommended Reading:
-Christopher, M., Peck. H. (2004) Marketing Logistics, Elsevier Butterworth-Heinemann.
-Rushton A., Oxley J., Croucher P. (2000) The Handbook of Logistics and Distribution Management, Kogan Page, London, 2nd edition.

- **References:** to be provided by the instructor

Course Description:

This course is designed to overview the marketing channels and logistics are analyzed as systems of interrelated and interdependent organizations engaged in making goods and services available for consumption by industrial, logistics, institutional and final consumers. This course emphasizes the means by which effective and efficient distribution channels, logistics and networks (comprising manufacturers, wholesalers, retailers, transportation firms and other actors in the distribution process) can be constructed. Particular attention is given to examining the enviromental issues and sustainability, in addition to, behavioral dimensions of channel relations, the roles of channel members, their use of power, the conflicts that arise among them and their communication procedures. Logistics is a major part of distribution channels management by which an organization may achieve a sustainable competitive advantage in today's private and public sectors.

Course Objectives:

Essentially, the course seeks to attain the following objectives:

- Explain the marketing channels and logistics frameworks, models and theories and describe the latest trends within that field, especially environmental changes.
- Explain the structure, dynamics and key processes of marketing channels and logistics and critically evaluate that evolving environment and sustainability.
- Identify and analyse the characteristics of the key marketing channel and logistics functions and evaluate relevant strengths and weaknesses; and solve related problems and changes.
- Analyse the essential role of marketing channels and logistics towards customer service, relationship management and value creation.
- Demonstrate written communication skills.
- Provide and explore examples from marketing practice and solve real-life marketing problems.

Course Outcomes:

After completion of this course, the student will be able to:

- **Knowledge and understanding:** Understand how marketing channels concepts and logistics can be used in organizations and affect on the environment.
- **Cognitive skills (thinking and analysis):** Apply key marketing terms and information as business tools and modern thoughts.
- **Communication skills (personal and academic):** Use marketing skills, cases, group presentation to improve better way of communication and networking.
- **Practical and subject specific skills (Skills):** Explore the importance of marketing channels and logistics in changing the way of reaching customers and linking between supply and demand sides based on the concept of sustainability and climate changes.
- **Practical and subject specific skills (Transferable Skills):**

Teaching Methods:

- This course is based on lectures that are given in English. Lecture sessions will be delivered using power points slides and blackboard. Presentations will focus on theoretical issues and real-life applications.
- A group presentation is required by students to provide a marketing case. Working in groups during this course will be valuable experience for your working life ahead.
- Case Presentation is necessary at the final two weeks of the semester.
- Students are strongly advised to participate during the lectures.
- A textbook is a must for students to read topics and understand this course.
- Course attendance is compulsory throughout the semester.

Assessment Instruments

	Mark
First Exam	15%
Second Exam	15%
Quizzes, Homework and Participation	10%
Project	10%
Final Exam	50%
Total	100%

Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates
Week 1	Ch. 1: Introduction to the module	**Task: Describe the key conceptual differences between logistics and supply chain management**
Week 2	Ch. 2-3: Customer Service, Logistics Information Systems & Technology	**Think point: how do you think have IT systems supported the development of modern logistics operations?**
Week 3	Ch. 4: Environmental Issues and Sustainability	**Task: Analysis the climate change effects on logistics.**
Week 4	Ch.5: Purchasing, Procurement & Inventory Management	**Task: Describe the inventory management techniques / approaches**
Week 5	Ch. 6: Materials Management	**Task: For various products, describe the most appropriate material**
Week 6	Ch. 7: Transportation	**Task: Describe the transportation method to be employed**
Week 7	Review and Exam	**First Exam**
Week 8	Ch.8-9: Business Process and Total Quality Management	**Think point: what do you think will be the key challenges when managing logistics quality.**
Week 9	Ch. 10: Organising for Effective Logistics	**Task: Describe the importance of effective logistics.**
Week 10:	Ch. 11: Logistics Financial Performance	**Task: Describe the importance of controlling the financial elements of**

		logistics operations
Week 11:	Ch.12: Value Chain Analysis and Climate Change	**Think point: Compare the various techniques examined in the lecture**
Week 12	Ch. 13: Global Logistics & Managing Logistics for the Future	**Think point: what do you think will be the key challenges when managing logistics operations in the future?**
Week 13:	Review and Exam	**Second Exam**
Week 14:	Ch. 14: Logistics Strategy & Benchmarking	**Task: Describe the role of logistics strategy for a firm**
Week 15	Ch. 15 Global Sustainability and Climate Change	**Discussion session; Submission of projects (reports/presentations)**
Week 16:	**Review and Exam**	**Final Exam**

Course Policies

University regulations apply to this course regarding class attendance, punctuality, exams, late submissions, absence with permission, penalties for cheating, and policies for assignments and projects, if any. Students should be aware of all those in addition to other rules and regulations stated and descried in the student handbook.

Course Modules

Course	**Marketing Channels & Logistics**
Module 1	**Introduction to Marketing Channels & Logistics**
Key Concepts	Marketing channels, Logistics and evolving environment.
Overview	The concepts of marketing channels and logistics and supply chain are introduced. Key logistics costs include customer service, inventory carrying costs, transportation, warehousing, order-processing, lot quantity costs, and environmental issues are explained. The focus also is on Green / environmental logistics in order to illustrates the importance of the environment and doing business under sustainable climate and resources. More attention is for the supply chain which encompasses the planning & management of all activities involved in sourcing & procurement, conversion and all logistics activities. Importantly, it also includes coordination and collaboration

	with channel partners, which can be suppliers, intermediaries, third-party service providers and customers in business environment.
Aim	• To provide students with a solid theoretical grounding in marketing channels & logistics principles. • To make students familiar with marketing channels and logistics applications. • To illustrate its critical role towards a firm's successful marketing strategy implementationin specific environment and sustainability.
Learning Outcomes	Students will be able to: • Explain the marketing channels and logistics frameworks, models and theories and describe the latest trends within that field. • Explain the structure, dynamics and key processes of marketing channels and logistics and critically evaluate that evolving environment. • Identify and analyse the characteristics of the key marketing channel and logistics functions and evaluate relevant strengths and weaknesses. • Critically analyse the essential role of marketing channels and logistics towards customer service, relationship management and value creation.
Units	12- Marketing channels 13- Logistics 14- Evolving environment.
Readings	Grant, D.B., Lambert, D.M., Stock, J.R., Ellram, L.M. (2011) Fundamentals of Logistics Management, European Edition, McGraw-Hill (Ch.1)
Activity	Review
Module 2	**Customer Service, Logistics Information Systems & Technology, and Logistics Environment**
Key Concepts	Logistics, Customer Service, Information Systems, Technology, Environmental Issues and Sustainability.

Overview	The concepts of customer service, Information and IT, and environmental issues are introduced. The elements of customer service can be classified into three groups: pre-transaction, transaction, and post-transaction elements. Companies should identify and overcome impediments to customer service to improve customer service performance using the right information systems and IT for better control under the changeable environments in countries especially when we deal with storage or transportation within a country or between countries.
Aim	• To explain customer service, and organization's marketing and logistics efforts. • To provide an overview of the ways that IT can be used in logistics operations. • To examine the strategic role of IT in logistics supply chain operations. • To show the control of logistics and supply chain in various environments especially climate changes for better sustainability.
Learning Outcomes	At the end of this module, students will be able to • To define customer service. • To show the central role that customer service plays in an organization's marketing and logistics efforts. • To use an IT application in logistics operations and supply chain operations. • To frame the logistics and supply chain in for better sustainability.
Units	11- Customer service 12- Customer satisfaction 13- Pareto principle 14- Information System 15- Sustainability
Readings	- Grant, D.B., Lambert, D.M., Stock, J.R., Ellram, L.M. (2011) Fundamentals of Logistics Management, European Edition, McGraw-Hill (Ch.2,3,4)
Activity	Review and Case Study on the use of IT to control climate change.
Module 3	**Logistics components: Purchasing, Procurement & Inventory Management , Materials Management, Transportation**

Key Concepts	Purchasing, Procurement, Inventory, Materials, Transportation, and Climate Change.
Overview	Many issues are discussed for how better management of purchasing leads to increased profitability. This is also to examine various types of supplier relations and the role of purchasing in supply chain management, with an emphasis on various types of partnerships. The basic concepts of inventory management are examined and the EOQ model is introduced, along with methods for adjusting it. In addition, it discussed demand and order cycle uncertainty especially for business performance and climate changes. The administration and control of materials flow requires that firms measure, report, and improve performance. Concepts and approaches used to do so include MRP I, MRP II, DRP systems
Aim	Students' knowledge about the components of logistics will be enhanced and directed for better performance in real life cases.
Learning Outcomes	At the end of this module, students are expected to • To show how better management of purchasing activities can lead to increased profitability. • To describe the impact of just-in-time production on purchasing. • To examine how the basic concepts of inventory management are applied. • To show how production policies influence inventory levels. • To demonstrate how inventories and customer service levels are interrelated and how inventory management contributes to least total cost logistics. • To identify and describe a variety of materials management philosophies and techniques under specific environment. • To examine transportation's role in logistics and its relationship to marketing especially when climate changes could happen.
Units	6- Customer sell and buy units 7- Inventory 8- Material flow 9- Transportation modes 10- Climate change
Readings	- Grant, D.B., Lambert, D.M., Stock, J.R., Ellram, L.M. (2011) Fundamentals of Logistics

	Management, European Edition, McGraw-Hill (Ch.5,6,7)
Activity	Review
Module 4	**Business Process and Performance**
Key Concepts	Process, Effective Logistics, Quality, Financial Performance
Overview	Business process is a fundamental rethink and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service and speed. Performance objectives consists of quality – customer service/score, scrap levels, complaints, cost – cost per hour, cost per unit, how competitive product is in the market place, dependability – reliable delivery, % of orders on time, flexibility – range of products offered, adaptability, time to market of new products, speed – responsiveness to the customer, and delivering product to the market ahead of time, cycle time, and lead time.
Aim	Students will be able to acquire a deeper knowledge about logistics in terms of the various process and effectiveness, total quality management, and business performance.
Learning Outcomes	At the end of this module, students will be able to • To describe the impact of business process on logistics. • To examine the total quality management concept of logistics management. • To show how the factors of performance are used
Units	10- Process flow 11- Quality 12- Performance factors
Readings	- Grant, D.B., Lambert, D.M., Stock, J.R., Ellram, L.M. (2011) Fundamentals of Logistics Management, European Edition, McGraw-Hill (Ch.8,9,10,11)
Activity	Review
Module 5	**Global Value Chain and Climate Change**
Key Concepts	Value Chain, Climate Change, Logistic Strategy, Sustainability, and Globalization.

Overview	The focus on the reasons firms expand into global markets. Firms that do so can become involved in exporting, joint ventures, direct ownership, importing. Our relationship with the environment is constantly re-defined, it is a relationship based largely on sustainability. The changes business and technology have brought about are mainly due to meeting the basic needs of a growing human population and their demand. It is therefore important to understand the consequences of our past and current activities for better future for business between countries.
Aim	Students will be able to understand relations between business and the environment, especially the potential for business activities to significantly change global climate and sustainability.
Learning Outcomes	At the end of this module, students will be able to • To identify some of the controllable and uncontrollable factors that affect global value chain and logistics activities. • To describe the major international distribution channel strategies—exporting, licensing, joint ventures, ownership, and importing in relation to climate change. • To identify the organisational, financial, and managerial issues related to global logistics focusing on the concept of sustainability.
Units	10- Value added 11- Business plan 12- Global business 13- Business changes
Readings	- Grant, D.B., Lambert, D.M., Stock, J.R., Ellram, L.M. (2011) Fundamentals of Logistics Management, European Edition, McGraw-Hill (Ch.12,13,14,14)
Activity	review

1. Course Specifics

Course Title	**Contemporary Issues in Marketing**
Course Number:	**0504433**
Course Prerequisite(s)	**0504101**
Course Co-requisite(s)	**-**
Credit Hours	**Lecture: 3 CH**
Lecture Days & Time	
Class Location	
Course Instructor/s	**Dr. Luai Jraisat**
Syllabus Approved by:	
b. Academic Committee	
a. Department Chair	

2. Academic Staff Specifics

Name	Academic Rank	Office Number, Location and Tel. Ext.	Office Hours	E-mail Address
Dr.Luai Jraisat	Ass.Professor	SB-F9		L.Jraisat@aum.edu.jo

3. Course Components

Resources:

- **Text book:**

Essential Reading:

-Saren, M., Maclaran, P., Goulding, C., Elliot, R., Shanker, A., and Catterall, M. (2013), *'Critical Marketing: Defining the Field',* Butterworth-Heinemann, ISBN: 13; 978-0-7506-8066-0.

-Hollensen, S. (2013), *'Global Marketing',* Second edition, Prentice Hall, ISBN: 978-0273706786.

-Brooks, I. and Weatherson, J. (2013), *'The Business Environment: Challenges and Changes',* Financial Times/Prentice Hall, ISBN: 978-0273646907.

- **References:** to be provided by the instructor

Course Description:

This course is designed to overview various topics on marketing related to climate change and how organizations and nations can adopt new strategies to provide sustainability. This course emphasizes the means by which having new products to market is the very foundation by which businesses grow their market share. Many of these businesses taking part in developing opportunity to identify what lies ahead in terms of a changing climate and the implications of such changes on our surroundings and our nations. In this course, a major part is focusing on putting significant efforts to explore the adaptation opportunities arising from issues of climate change and sustainability, such as modern marketing application, relationship marketing, green marketing, agricultural marketing, food security, and the process of global marketing.

Course Objectives:

Essentially, the course seeks to attain the following objectives:

- Explain the marketing and climate change, models and theories and describe the latest trends within that field, especially environmental changes.
- To develop awareness of the issue of climate change and the opportunities/challenges it presents for shareholder value-maximizing businesses.
- To understand the emerging climate economy and what it means to your company, its industry, and the global economy.
- To develop the frameworks to assess the market value/value-at-risk consequences of firms' exposure to climate change risks, and the economic analysis tools
- To develop your understanding of business to climate change and to inform your ability to shape the conversation in your company based on green marketing concepts.
- Demonstrate written communication skills.
- Provide and explore examples from marketing practice and solve real-life marketing problems.

Course Outcomes:

After completion of this course, the student will be able to:

- **Knowledge and understanding:** Understand how contemporary issues in marketing and climate change can be used in organizations.
- **Cognitive skills (thinking and analysis):** Apply key marketing terms and climate change as business tools and modern thoughts in global development.

- **Communication skills (personal and academic):** Use marketing skills, cases, group presentation to improve better way of communication and networking.
- **Practical and subject specific skills (Skills):** Explore the importance of marketing and climate change in changing the way of reaching customers and linking between supply and demand sides based on the concept of sustainability and climate changes.
- **Practical and subject specific skills (Transferable Skills):** Applying different issues.

Teaching Methods:

- This course is based on lectures that are given in English. Lecture sessions will be delivered using power points slides and blackboard. Presentations will focus on theoretical issues and real-life applications.
- A group presentation is required by students to provide a marketing case focusing on climate change. Working in groups during this course will be valuable experience for your working life ahead.
- Case presentation is necessary at the final two weeks of the semester.
- Students are strongly advised to participate during the lectures.
- A textbook is a must for students to read topics and understand this course.
- Course attendance is compulsory throughout the semester.

Assessment Instruments

	Mark
First Exam	15%
Second Exam	15%
Quizzes, Homework and Participation	10%
Project	10%

Final Exam	50%
Total	100%

Course Academic Calendar

Weeks	Basic and support material to be covered	Homework/reports and their due dates
Week 1	Ch. 1: Introduction to the module	**Task: Describe the key conceptual issues on marketing and climate change.**
Week 2	Ch. 2-3: Understand the Changing role of Marketing in the Modern Organization	**Task: Analysis the role of marketing in the modern organization**
Week 3		
Week 4	Ch. 4-5: Climate Change: Basic Issues and Corporate Implications	**Task: Analysis the climate change in modern implications.**
Week 5		
Week 6	Review and Exam	**First Exam**
Week 7	Ch. 6-7: Understand the Nature and Importance of Globalisation and the Process of Global Marketing	**Task: Describe the role of globalisation strategy for a business**
Week 8		
Week 9	Ch. 8-9: Climate Change, Sustainability, and Corporate Value Creation	**Task: Describe the importance of value creation.**
Week 10:		
Week 11:	Ch.10-12: Be aware of developments in the sphere of consumerism, environmentalism and 'green' marketing	**Task: Compare the various stages of green marketing**
Week 12		
Week 13:		
Week 14:	Review and Exam	**Second Exam**
Week 15	Group Presentation	**Discussion session; Submission of projects (reports/presentations)**
Week 16:	**Review and Exam**	**Final Exam**

Course Policies

University regulations apply to this course regarding class attendance, punctuality, exams, late submissions, absence with permission, penalties for cheating, and policies for assignments and projects, if any. Students should be aware of all those in addition to other rules and regulations stated and descried in the student handbook.

Course Modules

Course	Contemporary Issues in Marketing
Module 1	**Introduction to Contemporary Issue in Marketing**
Key Concepts	Marketing and Modern Organizations
Overview	The concepts of marketing in modern organizations are introduced. It is the fact that marketing as an organisational philosophy and activity is applicable to almost all types of organisation, whether profit making or not-for-profit. The number and type of organisations adopting marketing strategies is expanding. The philosophical aspect of marketing as a long-term company of wide business orientation is becoming more important.
Aim	To show that business take a rather myopic view of the subject and see marketing merely as a collection of well-developed management techniques, which when combined, constitute a functional area of the organisation's management operations for sustainability.
Learning Outcomes	Students will be able to: • Explain the marketing modern marketing frameworks, models and theories and

	describe the latest trends within that field. • Identify and analyse marketing for better value in business and sustainability for products in a connected world.
Units	15- Marketing value 16- Sustainability 17- Long-term business
Readings	Saren, M., Maclaran, P., Goulding, C., Elliot, R., Shanker, A., and Catterall, M. (2013), *'Critical Marketing: Defining the Field',* Butterworth-Heinemann, ISBN: 13; 978-0-7506-8066-0. (Ch.1,2)
Activity	Review
Module 2	**Climate Change And Implications**
Key Concepts	Climate Change, Marketing Strategy, Business Development, and Value.
Overview	This course should be able to answer many questions: What is climate change? What are its causes, what are its likely effects? What aspects of the evidence are strong? What are the key findings and uncertainties? Should marketing managers care about climate change? Why? What do businesses have to do with either the cause or effect of the phenomenon of climate change? What are the specific paths through which climate change impacts marketing? And how climate change could influence business value and its sustainability in business?
Aim	• To explain the importance of climate change in business. • To provide an overview of application of marketing in modern cases.
Learning Outcomes	At the end of this module, students will be able to • To define climate change. • To link between marketing and climate change in an organization.
Units	16- Climate

	17- Uncertainty 18- Value
Readings	- Pielke Jr., *The Climate Fix*, (2010), 'Dinner Table Climate Science,' (ch 1,2).
Activity	Review
Module 3	**Process of Global Marketing**
Key Concepts	Purchasing, Procurement, Inventory, Materials, Transportation, and Climate Change.
Overview	Understand that globalisation, the use of the Internet for information and transactional purposes, developments in transport and an increase in human mobility around the world has led to more discerning customers and different business models often using collaborative ventures and outsourcing of manufacturing and distribution.
Aim	Students' knowledge on how to be aware that more firms globally, especially in the new emerging markets are adopting a marketing approach to their business in order to secure and retain customers in an increasingly complex and volatile marketplace.
Learning Outcomes	At the end of this module, students are expected to • To show the importance of globalization on managing business. • To examine how various processes in global markets can affect businesses. • To develop a critical approach to the development of globalisation and understand the advantages and disadvantages of such developments to different types of organisations
Units	11- Global market 12- Global product 13- Global climate change
Readings	- Hollensen, S. (2005), *'Global Marketing',* Second edition, Prentice Hall, - ISBN: 978-0273706786. (Ch.6,7)
Activity	Review
Module 4	**Climate Change, Sustainability, and Corporate Value Creation**

Key Concepts	Climate Change, Sustainability, and Value Creation.
Overview	Climate change initiatives are closely linked to broader sustainability initiatives within companies. Needless to say, such initiatives become strategic only if and when they can be linked to the underlying business model, and to the value creation process in the company. The changes business and technology have brought about are mainly due to meeting the basic needs of a growing human population and their demand. It is therefore important to understand the consequences of our past and current activities for better future for business.
Aim	Students will be able to understand why climate change is needed for better value creation in the whole processes in doing businesses.
Learning Outcomes	At the end of this module, students will be able to • To gain the knowledge of links between climate change and marketing issues. • To identify the the different criteria that lead for sustainability in business.
Units	14- Change criteria 15- Sustainability 16- Value chain stages
Readings	- Allwin Initiative, "Corporate Sustainability Practices and Shareholder Value," http://mba.tuck.dartmouth.edu/initiative/pdf/ExecEnvSustainForum2009SummaryReport Fi nal.pdf (all)
Activity	review
Module 5	**Consumerism, Environmentalism and 'Green' Marketing**
Key Concepts	Consumers, Macro Environment, Micro Environment, Green Marketing
Overview	Be aware that the term 'green' is being applied in a number of situations these days. There are 'green' political parties in the world. Recycling of otherwise waste materials is

	another manifestation of what has come to be referred to as 'green consciousness'. Marketing firms have responded to these developments. Also firms need to have more 'green' in their business methods, particularly production and other operational methods. They have also become more 'green' in terms of the packaging used on their products, and of course in terms of the products themselves.
Aim	Students will be able to understand the concept of Green Marketing as a 'Pro-Active Policy'. Many firms are now adopting a 'pro active' rather than reactive 'green' marketing strategy in an attempt to gain a competitive business environment.
Learning Outcomes	At the end of this module, students will be able to • To identify the macro and micro environmental factors for better green marketing. • To examine the green marketing concept. • To show modeling for green marketing strategy.
Units	13- Macro environment 14- Micro environment
Readings	- McDonagh, P. and Prothero, A. (1997) *'Green Management: A Reader',* - Thomson Learning, ISBN: 978-1861524215. (Ch.8,9,10)
Activity	Review

JORDAN HU

ENVIRONMENTAL VOLUNTEERING

(111202370)

Hashemite University, Faculty of Natural Resources and Environment, Department of Land Management and Environment

First Semester, 2014-2015

Instructor Information

Instructor:	Dr. Jwan Ibbini
Office Location:	Natural Resources Building, Room #: 214
Telephone:	Office: +962(5)390-3333 Ext: 4633
Office Hours:	Sun- Wed 12-1 pm
E-mail:	jhibbini@hu.edu.jo

Course Identification

Course Number:	111202370
Course Name:	**Environmental Volunteering**
Course Location:	University Campus
Class Times:	Sun - Thurs 8:00am – 9:10am
Prerequisites:	

Faculty Web Page: http://hu.edu.jo/fac/Default.aspx?facid=68000000

Course Description/Overview

This third year level course would enable students to learn about their community through finding new doors to open and to participate in activities of their own choice, through which they can become thoughtful, reflective and active citizens. This course provides a convenient way to capture record and recognize the work of volunteers among their own environments and issues they seek to get involved in. There are challenges to help plan and review volunteering activity along with logs to keep track of the work carried out.

The flexibility of Environmental Volunteering Course means they can be carried out in a variety of settings, over a time period to suit the individual or group of students. Challenge descriptions can be interpreted and adapted according to the situation.

Course Learning Objectives

The main goals of this course are: a) to provide a critical approach to environmental volunteering supported by new advanced technologies in the context of education for sustainable environment; b) raise awareness of the role of some technologies in enabling learners to reflect critically on the rights, roles and responsibilities of an active citizen in preparing for a sustainable future for all; and c) use participatory video and social networking technologies as tools to help the community, including children, identify risks and develop climate change adaptation strategies. d) encourage students to work in groups and enhance presentation and social skills.
This course may also recognise one or more of the following motivations:
1) making a contribution to community, 2) promoting social interaction 3) personal development, 4) learning about the natural environment, 5) a general ethic of care for the environment, and 6) attachment to a particular place.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

53. Discuss the various learning outcomes of the student environmental volunteering
54. Connect theoretical background with their experience in their volunteering project.
55. Produce a 5-10 minute digital video (including storyboarding, lighting, shooting, editing sound tracks and graphics).
56. Use social media to raise awareness for action and advocacy from the bottom up.
57. Develop a lesson plan that integrates the produced digital artifact.
58. Apply principles of transformative learning design.
59. Demonstrate awareness and ability to discourse on ethical issues in using social media and social networking tools.

Course Resources

Students are encouraged to find and execute their volunteering projects and their outreach in any of the following bodies of interest such as: local communities, Governmental authorities, NGO's, or the private sector. The project scale of influence may extend from the community and national level to perhaps regional or global level.

Web Sites:

UN Volunteers
http://www.unv.org/en.html

EPA: Service Learning
http://www.epa.gov/osw/education/pdfs/svclearn.pdf

EPA: Wastes – What You Can Do?
http://epa.gov/osw/wycd/downloads/comm-serv2.htm

366 Community Service Ideas.
http://lancaster.unl.edu/4h/communityserviceideas.pdf

55 Environmental Service - Learning Projects
http://readwriteact.org/files/2013/01/55-Environmental-Service-Learning-Projects.pdf

Required Course Texts and Materials

Hand-outs prepared by the instructor for the class

http://www.unv.org/fileadmin/docdb/pdf/2014/corporate/20443_UN_Volunteers_POST-2015_Brief_-_Environmental_Sustainability_and_Volunteerism_WEB.pdf Environmental Sustainability and Volunteerism. January 2014. UNV issue brief

Lunch, N. and Lunch C. (2006). Insights into Participatory Video: Published by InsightShare. Available at http://www.insightshare.org/resources/pv-handbook

Thomas G., Measham and Guy B. Barnett. (2007) Environmental Volunteering: Motivations, Mode and Outcome. Australian Geographer 39(4) pp. 537-552 http://dx.doi.org/10.1080/0004918080241923

Manual on Movie Maker 2 and other software.

Windows Movie Maker free online video tutorials from Atomic Learning are Lunch, N. and Lunch C. (2006). Insights into Participatory Video: Published by InsightShare. Available at http://www.insightshare.org/resources/pv-handbook

Windows Movie Maker free online video tutorials from Atomic Learning are available at http://www.atomiclearning.com/moviemaker2. These tutorials are very helpful in learning the various features of Movie Maker. (You will need the QuickTime video player to view the Atomic Learning tutorials. If needed, click on QuickTime to download the latest version.)

Mackay, W. E. Video Techniques for Participatory Design: Observation, Brainstorming & Prototyping. CHI 2000 Tutorial http://www.daimi.au.dk/~mackay

Assignments and Grading Scheme

Grading System

Grades can be distributed as follow:

Project Title Submission Due on ( )	10 %
Progress Report Submission Due on ( )	20 %
Class attendance/participation (throughout the course)	10 %

Final Presentation (at the end of the semester)	60 %
Total Points	**100 %**

Requirements

Students present a portfolio of evidence of their activities. This portfolio will contain:

- completed Volunteering Short Course book and evidence of challenges completed
- planning and reviewing documents
- record of progress
- summary of achievement, identifying skills development

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL assigned classes. You cannot pass the class under any circumstances if you miss more than five classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 10% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites; Criteria for student selection
2		Discussion of reading material 1 and formulating working groups
3		Discussion of reading material 2 and submission of project title
4		Guest Speaker 1 and general discussion on volunteering options

5		Digital storytelling, participatory video (PV) and social media
6		Examples of participatory video clips and educational digital storytelling
7		Guest Speaker 2
8		The planning & design process for video clip/s production
9		Using scenarios in Video clip design and creating a storyboard
10		Participatory video clip production
11		Guest Speaker 3
12		Integrating participatory video clip in lesson planning
13		Integrating participatory video clip in lesson planning
14-16		Video clip uploading and posting along with other resources and plan for action. Final assessment Reflections on participatory video and social media as catalysts for personal and social change

APENDIX II: Environmental Volunteering Course Modules.

Course	Environmental Volunteering
Module 1	**Introducing Environmental Volunteering**
Key Concepts	Environmental Volunteering, Service learning
Overview	This module introduces concepts, principles and opportunities of environmental volunteering through reading materials and handouts. In more general terms course rational and expectations will be explained to students. The student centered approach in this class will enable learners to think, plan and interact with the community to execute their ideas, to record their learning outcome and share their own stories using media technology for producing a video clip.
Aim	The aim of this module is to introduce the concept of volunteerism, service learning, environmental leadership and environmental sustainability to students. And to explain the benefits of volunteerism to volunteers and community.
Learning Outcomes	At the end of this module learners will be able to: • Discuss potential volunteering ideas. • Discuss how technology and media can contribute to social change. • Explain how volunteerism reinforces capacity development.
Readings	- Using the world wide web as a learning medium student should explore

	the internet and look for potential ideas - Handouts will be given to students to read such as: Thomas G., Measham and Guy B. Barnett. (2007) Environmental Volunteering: Motivations, Mode and Outcome. Australian Geographer 39(4) pp. 537-552 http://dx.doi.org/10.1080/00049180802419 23
Activity	**Overview** - Discussion of student reading - Invite one or more of the students in previous class and explain how this - learning methods contributed to his/her development. - Discussing challenges and possible roundabouts (use of good planning and thinking a head). - Invite a guest speaker to the class to share experience and offer a wider horizon of thinking. - Plan a field trip to the Royal Botanical Gardens and demonstrate a whole day class volunteering. - Forming groups and discussing the pros and cons of working within a team. - At the end of this module students shall submit the names in the group and the title of volunteering project.
Module 2	**Volunteering Promoting Environmental Sustainability**
Key Concepts	Active citizen approach, think globally act locally
Overview	In this part of the course the volunteering impact on sustainable development will be highlighted through reading materials and case studies from different parts of the world. This module will outline the environmental sustainable development through volunteering examples where such approach was

	successfully implemented and highlighting some of the key challenges.
Aim	The aim of this module is to show the intrinsic interconnectedness of volunteerism and environmental sustainability
Learning Outcomes	At the end of this module learners will be able to: * Think outside the box and to experience a creative learning atmosphere. * Identify an environmental issue of interest. * Understand the links of volunteering and environmental sustainability.
Units	
Readings	Gough, A. (2005). Sustainable Schools: Renovating Educational Processes. Applied Environmental Education and Communication, 4:339–351 Ofsted (2009) Education for sustainable development: Improving schools, improving lives. Available at: www.ofsted.gov.uk/resources/education-for-sustainable-development-improving-schools-improving-lives . http://www.unv.org/fileadmin/docdb/pdf/2014/corporate/20443_UN_Volunteers_POST-2015_Brief_-_Environmental_Sustainability_and_Volunteerism_WEB.pdf Environmental Sustainability and Volunteerism. January 2014. UNV issue brief
Activity	**Overview**

	In this part of the course students will be asked to interact and connect with the community and start making arrangements for their work. A brief description of their work scheme should be presented and discussed with the teacher in order to give insights and comments for final approval of the project line.
Module 3	**Digital Video Design for Advocacy, Empowerment and Change.**
Key Concepts	Video design, Participatory video
Overview	This module is intended to use hypermedia technology to produce a digital video for advocacy, empowerment and to provide a summary of the environmental volunteering project. The advocacy using media technology is an important way to produce an educational material as a tool to boost education strategies.
Aim	This module aims at executing environmental volunteering projects during which media material is collected for video making.
Learning Outcomes	Towards the end of this module students will: * Obtain knowledge on the concept of participatory video. * Plan, develop and prepare a video clip of their volunteering project.
Units	
Readings	Lunch, N. and Lunch C. (2006). Insights into Participatory Video: Published by InsightShare. Available at http://www.insightshare.org/resources/pv-handbook Windows Movie Maker free online video tutorials from Atomic Learning are Lunch, N. and Lunch C. (2006). Insights into Participatory Video: Published by InsightShare. Available at http://www.insightshare.org/resources/pv-handbook

Activity	Overview
	At this stage students shall produce a progress report (4 pages max.) including project title, objectives, accomplished and planned activities, learning tasks, feedbacks and challenges. Plan Your Own participatory video by collecting photos, videos, interviews, text material to be implemented in the video clip.
Module 4	**Video Clip Production, Editing and Presentation**
Key Concepts	Editing a video clip, presentation skills
Overview	When planning a video clip for the volunteering project, students should learn some filming skills along with editing and paying attention to the quality of pictures, sound, lighting, zooming, focusing and text material. The rapid development of multimedia and hypermedia technologies has provided new avenues for merging images, sound, movies and animation together with texts. Digital video production could offer possibilities for advocacy, empowerment and change. An empowering process is where video itself plays an emancipating role and advocacy for "lobbying," "campaigning," and "activism". In this way technology becomes a means to bring about social justice and environmental protection.
Aim	The aim of this module is to involve students in the process of filming and editing the video clip that is assigned to their project.
Learning Outcomes	The learning outcome include: * Applying editing and processing of a video clip. * Presenting video clips and discussion with audience, explaining the challenges and learning experiences of the team.
Units	

Readings	Manual on Movie Maker 2 and other software Mackay, W. E. Video Techniques for Participatory Design: Observation, Brainstorming & Prototyping. CHI 2000 Tutorial http://www.daimi.au.dk/~mackay Lynagh, M. (2010). Using video in community health advocacy: Critical review of a participatory workshop with Breastfeeding Patrol, Mandaluyong City, Manila. Submitted in partial fulfilment of the MA degree in Development and Emergency Practice Oxford Brookes University Fab, S. & Kay, S. Using communication media as a tool for campaigning: Air France In-flight Video Evaluation of the Austria In-flight Video. ECPAT International
Activity	**Overview** **Assignment**: Good video production begins with good planning and storyboarding. Go to KidzOnline, select the Guest Login link and register for this free resource. Then select the Tech Training tab and check out the Technology Units available. Select the Digital Video Unit and Stream the following selections: #2 Digital Video: Getting Started and #4 Digital Video: Storyboard. Students should start their video production, editing and finalizing their participatory video connecting the elements of their story.

Computer Science and applications Department

Course Syllabus

111001320: Computer Networks

Hashemite University, Prince Al Hussein Bin Abdullah II for Information Technology, Computer Science

Instructor Information

Instructor: Ibrahim Obeidat, Dr.

Office Location: IT 233

Telephone: +962 798282630

Office Hours: Sun, Tue, Thur (9:00AM - 11:00 PM)

E-mail: imsobeidat@HU.EDU.JO

Website: http://staff.hu.edu.jo/obeidat

Course Identification

Course Number: 111001320

Course Name: Computer Networks

Course Location: http://www.hlms.hu.edu.jo

Class Times: Sun, Tue, Thur 9-10:00Am – 12-1:00pm

Prerequisites:

Faculty Web Page: http://www.hu.edu.jo/fac/Default.aspx?facid=67000000

Course Description/Overview

This course is an introductory course on computer networks. It introduces the underlying concepts and principles of modern computer networks with emphasis on protocols, architectures, and implementation issues. The main goal of this course is to understand layering in computer networks, understand different protocol stacks (OSI and TCP/IP), understand functions and protocols within a layer, understand how layers fit together and finally understand how the Internet works. The course provides case studies, particularly related to climate change issues, showing how students, families and citizens can be "empowered" to make their voices heard in the process for building a more sustainable society. The course contains focus group discussions, Students will be engaged in a self-reflective process assessing the strengths and limitations of applying climate change concepts.

Course Learning Objectives

The course is intended to meet the following learning objectives:

1. Understanding the underlying concepts and principles of modern computer networks with emphasis on protocols, architectures, and implementation issues.

2. Understanding layering in computer networks.
3. Understanding different protocol stacks and how the Internet works.
4. To learn how to use networks to raise awareness of the role of some technologies in enabling learners to reflect critically on the rights, roles and responsibilities of an active citizen in preparing for a sustainable future for all

Course Content Learning Outcomes

1. **Knowledge and Understanding** (Objective 1)

   Having successfully completed this course, you will be able to demonstrate knowledge and understanding of:

   - the principles of modern computer networks
   - Specific and detailed knowledge and understanding in a number of chosen topics in the area of computer networks

2. **Intellectual Skills** (Objective 2)

   Having successfully completed this course, you will be able to:

   - analyze, review and critically evaluate the your work and the work of peers
   - explain the inter-relationship of areas of computer science and the ways in which the convergence of technologies drives the development of computer networks and its effects on climate change

3. **Practical Skills** (Objectives 2,3**)**

Having successfully completed this course, you will be able to:

- develop skills necessary to understand different protocols and layering in computer

networks

4. **General Transferable Skills** (Objective 4)

Having successfully completed this course, you will be able to:

- communicate technical information in a written format, and to an agreed academic convention
- communicate technical information in a verbal format
- work collaboratively with others to achieve greater understanding of a technical issue and sustainable environment

Course Resources

Course Website(s)

- http://www.hlms.hu.edu.jo (Login using your student number and password)
- https://www.coursera.org/course/comnetworks
- https://class.stanford.edu/courses/Engineering/Networking/Winter2014/about
- http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-829-computer-networks-fall-2002/

Required Course Texts and Materials

Data Communications and Networking, Behrouz Forouzan, 4th ed., McGraw-Hill, 2007.

Optional Course Texts and Materials

- Data and Computer Communication, William Stallings, 9th ed., Prentice-Hall 2011.

- Computer Networks, Andrew S. Tanenbaum, 5th ed., Prentice-Hall, 2011.
- Computer Networks and Internets, Douglas E. Comer, 5th ed., Prentice-Hall, 2008.

Assignments and Grading Scheme

Grading System

Letter grades will be awarded based on the following scale.
80-100%: A range (A+,A, A-)
70-80%: B range (B+, B, B-)
60-70%: C range (C+, C, C-)
50-60%: D range (D+, D)
Below 50%: F
These thresholds are not binding. We may lower the thresholds described here depending on the performance of the class. We will not raise the thresholds. We will give an approximate grade breakdown in the middle of the semester, but **you are responsible for keeping track of your own grades.** If you would like to appeal your grade on any of the assignments or exams, you may do so within **one week** of the assignment or exam being handed back. Your **entire** assignment or exam will be regarded and your grade may go up or down, or it may stay the same

Grading Policy

Assignments	25%
Class attendance/participation	5%
Midterm Exams	20%
Final Exam	50%
Total Points	**100**

Course Policies

Late Assignments

Assignments are due on the posted dates. There is a 20% deduction for late assignment. The deduction becomes 50% if the assignment is two days late. No credit is given after three days. Any exceptions must be arranged at least a day before the assignment is due.

Classroom Protocol

1. Students are expected to read the appropriate sections of the book before each lecture.
2. Please be considerate of your classmates during class.
3. Students are expected to show courtesy and respect toward their classmates.
4. Please come to class on time. If you are late more than 10 minutes then you are not allowed to enter the class.
5. Please make sure that your cellular phone does not interrupt during lecture time, and especially during test time.
6. Please do not carry on side discussions with other students during lecture time.
7. When you have a question, please raise your hand and ask the question so that everyone may benefit from it.

Dissability

Students with special needs should discuss their needs with instructor before the first class to allow for proper arrangements.

Important Dates to Remember

Midterm Exams [during week 9]
Final Exam [during week 16]
Project deadline [end of week 14]

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines
1		**Introduction to computer networks**
2		**Network protocols, architectures and applications.** **Assignment** The student should prepare a survey study for the positive and negative effects of networks on climate change and how it relates to networking applications and protocols.
3		**Networks Models**
4		**The Types of the Transmission Media**
5 +6		**Switching Circuits**
7+8		**Data Link Control** **Assignment** This is a programming assignment in which student should develop their own code to implement one of the data link layer protocols. The details of the assignment can be found on the course website
		MidTerm Exam
9+10		**Multiple Access**
11+12		**Connecting LANs, Backbone Networks and Virtual LANs**
13		**Network Layer: Logical Addressing**
14+15		**Vitual circuit switching :Frame Relay and ATM**

		Final Exam

Course Syllabus

Course Number: (**110302238)**

Education for Sustainable Development

Hashemite University, Faculty of Educational Sciences, Department of Curricula & Instruction,

Fall Semester, 2014-2015

Instructor Information

Instructor: Dr. Ahmad Qablan

Office Location: Economics Building 241

Telephone: Ext. 5070

Office Hours:

E-mail: ahqablan@gmail.com

Website:

Course Description/Overview

Education is the most effective means that society possesses for confronting the challenges of the future. Indeed, education continuously shapes and reshapes the world of tomorrow. As the world is

facing serious environmental problems that could threaten the existence of all mankind on earth, the course “teaching and learning for a sustainable world” comes to help teachers better prepare future generations on how to deal with various environmental problems and issues. It seeks to help them better understand the complexity of the world around us? How are the problems of our world interconnected, and what does that imply for their solution? What kind of world do we want for the future, within the limits of our Earth’s life support systems? How can we reconcile the requirements of economy, society, and the environment?

The course intends to strengthen teachers’ capacities to learn diverse ways to reorient their everyday classroom teaching and learning and address the global and local environmental concerns. The course adopts Inquiry-based learning approach as an overall guiding model of learning. Inquiry is most consistent with development of the skills for lifelong learning as it prepares learners to know what to do when the options before them are not clear. Inquiry approach is directed by questions that learners work together to address. Both process and products of learning are assessed.

Course Learning Objectives

Educating for a sustainable future is not so much about a destination as about the process of learning to make decisions that consider the long-term economy, ecology and equity of all communities. Its goal is to build an enduring society, which involves learning how to anticipate the consequences of our actions envision a sustainable future and create the steps needed to achieve the vision. Individuals and societies will perpetually have to make choices. How those choices are made and the information and ethical discernment used in making them will determine whether our visions of a sustainable future are achieved.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

- To develop an appreciation of the scope and purpose of educating for a sustainable future.
- To clarify concepts and themes related to sustainable development and how they can be

integrated in all subject areas across the school curriculum.

- To enhance skills for integrating issues of sustainability into a range of school subjects and classroom topics.
- To enhance skills for using a wide range of interactive and learner-centred teaching and learning strategies that underpin the knowledge, critical thinking, values and citizenship objectives implicit in reorienting education towards sustainable development.
- To encourage wider awareness of Information and Communication Technologies (ICTs), the potential of multimedia-based approaches to education and the potential of the Internet as a rich source of educational materials.
- To enhance skills in computer literacy and multimedia education.

Course Resources

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class

- UNESCO. (2010). Teaching and Learning for a Sustainable Future.
    - Curriculum Rationale.
    - Across the curriculum.
    - Contemporary issues.
    - Teaching and learning strategies.

- NOAA Costal Services Center. (2010). Local Strategies For Addressing Climate Change.
- International Alliance of Leading Education Institute. (2009). Climate Change and Sustainable Development: The Response from Education: A cross-national report.

- West Coast Environmental Law. (2012). Preparing for Climate Change: An Implementation guide for local governments in British Columbia.

- Agyeman, Julian, Robert D. Bullard and Bob Evans (Eds.) (2003). Just Sustainabilities: Development in an Unequal World. London: Earth scan. (Introduction and conclusion.).

- Ayers, Jessica and David Dodman. (2010). "Climate change adaptation and development: the state of the debate". Progress in Development Studies 10 (2): 161-168.

- Baker, Susan. (2006). Sustainable Development. Milton Park, Abingdon, Oxon; New York, N.Y.: Routledge. (Chapter 2, "The concept of sustainable development").

- Brosius, Peter (1997) "Endangered forest, endangered people: Environmentalist representations of indigenous knowledge", Human Ecology 25: 47-69.

- Lohman, Larry (2003) "Re-imagining the population debate". Corner House Briefing 28.

- Martínez-Alier, Joan et al. (2010). "Sustainable de-growth: Mapping the context, criticisms and future prospects of an emergent paradigm" Ecological Economics 69: 1741-1747.

- Merchant, Carolyn (Ed.) (1994) Ecology. Atlantic Highlands, N. J: Humanities Press. (Introduction, pp 1-25.)

- Osorio, Leonardo et al. (2005). "Debates on sustainable development: towards a holistic view of reality". Environment, Development and Sustainability 7: 501-518.

- Robbins, Paul (2004) Political Ecology: A Critical Introduction. Blackwell Publishing.

Assignments and Grading Scheme

Grading Policy

Grades can be based on the following:

Assignments	20%
Exams	60
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than 6 classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites.
2-4		**Module 1: Introducing ESD**: An introduction to global realities, imperatives for sustainable development and educational issues that form the rationale for Educating for a Sustainable World. The topics that will be explored through this module are: • Exploring global realities • Understanding sustainable development • Reorienting education for a sustainable future
5-8		**Module 2: Sustainable Development across the Curriculum**: An overview of ways in which Educating for a Sustainable Future can be integrated into all areas of the curriculum. The topics that will be explored through this module are: • Sustainable futures across the curriculum • Learning Cycle as a model of inquiry teaching and learning

		• Supporting strategies to connect between instruction, assessment, and classroom management
9-12		**Module 3: Current Issues:** An illustration of how different curriculum themes may be reoriented to integrate an interdisciplinary emphasis on sustainable futures. The topics that will be explored through this module are: • Understanding world hunger • Population & development • Culture for a sustainable future • Women & sustainable development • Sustainable communities
13-16		**Module 4: Teaching & Learning Strategies**: Practical advices on using teaching and learning strategies that can help students achieve the wide range of knowledge, skill and values objectives of Education for Sustainable Development. The topics that will be explored through this module are: • Experiential learning • Storytelling • Inquiry learning • Future Problem Solving • Learning outside the classroom • Community Problem Solving

Course Modules

Course 1	**Introducing ESD**
Module 1.1	Exploring global realities
Key Concepts	ESD dimensions, interrelationships, empowering people
Overview	This module introduces some of the major issues – the global realities – that need to be addressed in building a sustainable future. As such, it serves as a foundation for the more in-depth studies in following modules. It also highlights the interdependence of these issues and how our daily lives, as

	inhabitants of the world, are related to social, economic and environmental processes. The module demonstrates that changes to the way resources are used are possible, that social and environmental problems can be solved, and that we have the collective capacity to overcome the many problems we face.
Learning Outcomes	At the end of this module learners will be able to: • To develop an understanding of the range of social, economic and environmental issues facing the world today • To develop an understanding of the interrelationships among these different types of issues • To recognise that education can play a key role in empowering people to work for a sustainable future.
Readings	Brown, L.R. *et al*. (Annual) *State of the World Report*, Worldwatch Institute, Washington DC. Reuters.com *State of the World* UN-HABITAT (Annual) *State of the World's Cities*, Earthscan Publications, London. United Nations Children's Fund (Annual) *State of the World's Children Report*, UNICEF, New York. United Nations Development Programme (Annual) *Human Development Report*, Oxford University Press, New York.

	United Nations Environment Programme (Annual) *UNEP Yearbook*, UNEP, Nairobi. United Nations Population Fund (Annual) *State of World Population*, United Nations Publications, New York. World Bank (Annual) *World Bank Development Report*, World Bank, Washington DC. World Bank (Annual) *World Bank Development Indicators*, World Bank, Washington DC. World Resources Institute, United Nations Environment Programme, United Nations Development Programme and World Bank (2008) *World Resources 2008*, Oxford University Press, New York.
Activities	1. Behind the news 2. Exploring the links 3. Acting locally 4. Strategic Questioning 5. Reflection

Module 1.2	Understanding sustainable development

Key Concepts	SD, interpretations of SD, approaches to SD
Overview	This module explores the emerging concept of 'sustainable development' which is now central to the programmes of many governments, businesses, educational institutions and non-government organisations around the world. The module takes an historical approach tracing the widening understanding of sustainable development from the 1980s up to the present day. This history includes landmark international events such as: the 1987 Brundtland Report, the 1992 Earth Summit in Rio de Janiero, the 1997 Rio+5 Conference and the 2000 Millennium Summit in New York, and the 2002 World Summit on Sustainable Development in Johannesburg. Much has been written in academic terms about the meaning of sustainable development and the need to integrate ecological and economic principles into personal and public decision-making. However, there is no agreed definition of the concept and perhaps there is no need for one. This is because sustainable development concerns a process of change and is heavily reliant upon local contexts, needs and interests. Thus, sustainable development is an 'emerging concept' in two ways, first, because it is relatively new and evolves as we learn to grasp its wide implications for all aspects of our lives, and, second, because its meanings emerge and evolve according to local contexts.
Learning Outcomes	At the end of this module learners will be able to: • To develop an understanding of the emerging concept of sustainable development; • To analyse the value base behind a range of different

	interpretations of sustainable development; • To appreciate the differences of approach to sustainable development in countries of the North and the South; and • To develop your own definition of sustainable development.
Readings	_____ (2000) Sustainability: Searching for Solutions, *New Internationalist*, 329, November Issue. AtKisson, A. (1999) *Believing Cassandra: An Optimist Looks at a Pessimist's World*, Chelsea Green, Vermont. Dresner, S. (2002) *The Principles of Sustainability*, Earthscan, London. IUCN, UNEP and WWF (1991) *Caring for the Earth: A Strategy for Sustainable Living*, IUCN, Gland, Switzerland. Orr, D. (1992) *Ecological Literacy: Education and the Transition to a Postmodern World*, State University of New York Press, Albany, Ch. 2. Soubbotina, T.P. with Sheram, K.A. (2000) Beyond Economic Growth: Meeting the Challenges of Global Development, World Bank Development Education Progamme, Washington. Wackernagel, M. and Rees, W. (1996) *Our Ecological Footprint: Reducing Human Impact on the Earth*, New Society Publishers, Gabriola Island BC, Canada.

	World Commission on Environment and Development (1987) *Our Common Future*, Oxford University Press, Oxford.
Activities	1. What is sustainable development? 2. Dimensions of sustainable development 3. The Millennium Development Goals 4. The World Summit on Sustainable Development 5. The Earth Charter 6. Reflection

Module 1.3	Reorienting education for a sustainable future
Key Concepts	ESD, values, knowledge, skills, reorienting
Overview	Modules 1, 2 established a vision of education as a force for the future in developing the knowledge, commitment and skills needed to address the downward spiral of unsustainable development. This module builds on the ideas for reorienting education towards a sustainable future introduced in these earlier modules. The module reviews the development of the concept of Education for Sustainable Development and illustrates various strategies for reorienting education in the school sector as a key part of the broader process of building a sustainable future.
Learning	At the end of this module learners will be able to:

Outcomes	• To explore the holistic nature of the concepts of 'environment', 'sustainable futures' and 'education for sustainable development'; • To clarify the emerging concept of Education for Sustainable Development; • To appreciate the range of knowledge, value and skill objectives of Education for Sustainable Development; and • To understand the broad scope of actions needed to reorient Education for Sustainable Development.
Readings	Breiting, S., Meyer, M. and Morgensen, F. (2005) *Quality Criteria for ESD-Schools: Guidelines to Enhance the Quality of Education for Sustainable Development*, EU-COMENIUS 3 network 'School Development through Environmental Education' (SEED). Fien, J. (ed) (1993) *Environmental Education: A Pathway to Sustainability*, Deakin University Press, Geelong. Fien, J. (2002) *Education and Sustainability: Reorienting Australian Schools for a Sustainable Future*, Tela Papers, No. 8. Australian Conservation Foundation, Melbourne. Hren, B. and Birney, A. (2004) *Pathways: A Development Framework for School Sustainability*, WWF, Godalming, Surrey. Huckle, J. (2008) 'Sustainable development', in Arthur, J., Davies, I. and Hahn, C. (eds) *The Sage Handbook of Education for Citizenship and Democracy*,

Sage Publications, London, Chapter 26.

Reid, A. *et al*. (2008) *Participation and Learning: Perspectives on Education and the Environment, Health and Sustainability*, Springer, Dortrecht.

Scott, W. and Gough, S. (eds) (2003) *Key Issues in Sustainable Development and Learning: A Critical Review*, Routledge Falmer, London.

Scott, W. and Gough, S. (2003) *Sustainable Development and Learning, Framing the Issues*, Routledge Falmer, London.

Sterling, S. (2002) *Sustainable Education: Re-visioning Learning and Change*, Green Books, Bristol.

Sterling, S. et al (2005) *Linking Thinking: New Perspectives on Thinking and Learning for Sustainability*, WWF Scotland.

United Nations Conference on Environment and Development (1992) Promoting education and public awareness and training, in *Agenda 21*, Chapter 36.

UNESCO (1997) *Educating for a Sustainable Future: A Transdisciplinary Vision for Concerted Action*.

UNESCO (2002) *Education for Sustainability – From Rio to Johannesburg: Lessons learnt from a decade of commitment*.

Activities	1. An holistic vision 2. Education for Sustainable Development 3. Reorienting education 4. The objectives of education for a sustainable future 5. Reflection

Module 2	**Sustainable Development across the Curriculum**
Module 2.1	Sustainable futures across the curriculum
Key Concepts	Formal and information curriculum, interdisciplinary, reorienting
Overview	Education for Sustainable Development involves a comprehensive approach to educational reform. It extends beyond the boundaries of individual school subjects and requires the attention of teachers, educational administrators, planners and curriculum agencies. Integrating the objectives, concepts and learning experiences of Education for Sustainable Development into syllabuses and teaching programmes is an important part of such reform, indeed: A basic premise of education for sustainability is that just as there is a wholeness and interdependence to life in all its forms, so must there be a unity and wholeness to efforts to understand it and ensure its continuation. This calls for both interdisciplinary inquiry and action. It does not, of course, imply an end to work within traditional disciplines. A

	disciplinary focus is often helpful, even necessary, in allowing the depth of inquiry needed for major breakthroughs and discoveries.
Learning Outcomes	At the end of this module learners will be able to: • To appreciate the importance of both the formal and informal curriculum in promoting Education for Sustainable Development; • To understand ways in which general educational objectives, interdisciplinary teaching methods, different subjects and various celebrations in the school calendar may be used to help reorient the curriculum of a school towards sustainability; and • To promote across-the-curriculum approaches to Education for Sustainable Development.
Readings	Breiting, S. and Meyer, M. and Morgensen, F. (2005) *Quality Criteria for ESD-Schools: Guidelines to Enhance the Quality of Education for Sustainable Development*, EU-COMENIUS 3 network 'School Development through Environmental Education' (SEED). Dandell, K., Ohman, J and Ostman, L. (2005) *Education for Sustainable Development: Nature, School and Democracy*, Studentlitteratu, Lund. Fien, J. (2002) *Education and Sustainability: Reorienting Australian Schools for a Sustainable Future*, Tela Papers, No. 8. Australian Conservation Foundation, Melbourne. Hren, B. and Birney, A. (2004) *Pathways: A Development Framework for School Sustainability*, WWF, Godalming, Surrey.

	Reid, A. *et al*. (2008) *Participation and Learning: Perspectives on Education and the Environment, Health and Sustainability*, Springer, Dortrecht. Scott, W. and Gough, S. (2003) *Sustainable Development and Learning, Framing the Issues*, Routledge Falmer, London. Sterling, S. (2002) *Sustainable Education: Re-visioning Learning and Change*, Green Books, Bristol. Sterling, S. et al (2005) *Linking Thinking: New Perspectives on Thinking and Learning for Sustainability*, WWF Scotland. Wals, A., Shallcross, T., Robinson, J. and Pace, P. (Eds) (2006) *Creating Sustainable Environments in Our Schools*, Trentham Books, Stoke-on-Trent, Staffordshire.
Activities	1. What is the curriculum? 2. Interdisciplinary teaching and learning 3. Integrating through educational objectives 4. Infusing through learning experiences in all subject areas 5. Celebrations in the school calendar 6. Reflection

Module	Learning Cycle as a model of inquiry teaching and learning

2.2	
Key Concepts	Learning cycle, exploration, explanation, elaboration, evaluation
Overview	The Learning Cycle model has five phases: engagement, exploration, explanation, elaboration, and evaluation. In the engagement phase, teacher or a curriculum task accesses the learners' prior knowledge and helps them become engaged in a new concept through the use of short activities that promote curiosity and elicit prior knowledge. The activity should make connections between past and present learning experiences, expose prior conceptions, and organize students' thinking toward the learning outcomes of current activities. Exploration experiences provide students with a common base of activities within which current concepts (i.e., misconceptions), processes, and skills are identified and conceptual change is facilitated. Learners may complete lab activities that help them use prior knowledge to generate new ideas, explore questions and possibilities, and design and conduct a preliminary investigation. The explanation phase focuses students' attention on a particular aspect of their engagement and exploration experiences and provides opportunities to demonstrate their conceptual understanding, process skills, or behaviours. This phase also provides opportunities for teachers to directly introduce a concept, process, or skill. Learners explain their understanding of the concept. An explanation from the teacher or the curriculum may guide them toward a deeper understanding, which is a critical part of this phase. In the elaboration phase, teachers challenge and extend students' conceptual understanding and skills. Through new experiences, the students develop deeper and broader understanding, more information,

	and adequate skills. Students apply their understanding of the concept by conducting additional activities. The evaluation phase encourages students to assess their understanding and abilities and provides opportunities for teachers to evaluate student progress toward achieving the educational objectives.
Learning Outcomes	At the end of this module learners will be able to: • Know the 5 phases of the learning cycle and how to use them in designing their lessons. • Understand ways in which environment can be introduced in the lesson in the elaboration phase. • Promote across-the-curriculum the learning cycle approach to Education for Sustainable Development.
Readings	• BSCS (2006). *BSCS Biology: A Human Approach (third edition)*. Dubuque, IA: Kendall/Hunt Publishing Company. • BSCS (2003). *BSCS biology: A human approach (second edition)*. Dubuque, IA: Kendall/Hunt Publishing Company. • BSCS (1997). *BSCS biology: A human approach (first edition)*. Dubuque, IA: Kendall/Hunt Publishing Company. • BSCS (2000). *Making Healthy Decisions: Alcohol, Tobacco, and Other Drugs*. Dubuque, IA: Kendall/Hunt Publishing Company. • BSCS (2006). *BSCS Science: An Inquiry Approach*. Dubuque, IA: Kendall/Hunt Publishing Company. • BSCS (2005). *BSCS Science & Technology (third edition)*. Dubuque, IA: Kendall/Hunt Publishing Company. • BSCS (1999). *Middle School Science & Technology (second edition)*. Dubuque, IA: Kendall/Hunt Publishing Company. • Campbell, T. C. (1977). An evaluation of a learning cycle intervention

	strategy for enhancing the use of formal operational thought by beginning college physics students. *Dissertation Abstracts International* 38(7): 3903A.
Activities	1. Bernoli's principle. 2. Animal behaviour. 3. Water pollution. 4. E-Government.

Module 2.3	Supporting strategies to connect between instruction, assessment, and classroom management
Key Concepts	Techniques, constructivism, 21st century skills
Overview	This module builds on the previous module that introduced the 5 stages of learning cycle. During each stage of the learning cycle, teachers can utilize several strategies to guide their students' learning to examine their prior knowledge and conceptions. Once ideas are revealed, students have an opportunity to explore their ideas, arguing about and testing them in process. When students see that their existing ideas do not fully match their findings, a disequilibrium cognitive state result, which opens the door to the construction of new scientific ideas. When students reach the stage where they develop the formal scientific understandings and patterns of reasoning that help them make

	sense of phenomena being studied, they are encouraged to extend their learning and apply their ideas to a new situation or context (Keeley, 2008). Throughout the various stages of the learning cycle, teachers design and monitor instruction so that students become increasingly conscious of their own and others' ideas. They gain confidence in their ability to learn, apply concepts to new situations, and construct evidence-based argument (Lawson, 2000). Teachers orchestrate student learning in different ways at different stages, encouraging a classroom climate where ideas are openly generated and sufficient time is allowed for sense making and construction of new knowledge. All the while they are facilitating students' construction of new ideas, teachers are formatively assessing by monitoring students' changing conceptions and adapting their teaching and assessment strategies to match their students' needs.
Learning Outcomes	At the end of this module learners will be able to: • Know various classroom techniques that can be used to teach their lessons. • Design their lesson plans utilizing some of the classroom techniques they learned. • Investigate how each technique works and the educational advantage that each technique can offer.
Readings	• Keeley, P. (2008). *Science formative assessment: 75 Practical strategies for linking assessment, instruction, and learning*. California:

	Corwin Pres. • Lipton, L., & Wellman, B. (1998). *Pathways to understanding: Patterns and practices in the learning-focused classroom*. Sherman, CT: Mira Via. • Lord, T. & Orkwiszewski, T. (2006). Moving from didactic to inquiry-based instruction in a science laboratory. *American Biology Teacher, 68*(6), 342- 345. • Graham, P. (2005). Classroom-based assessment: Changing knowledge and practice through preservice teacher education. *Teaching and Teacher Education, 21*, 607–621.
Activities	1. Multiculturalism. 2. Electrical circuits.

Module 3	**Current Issues**
Module 3.1	Understanding world hunger
Key Concepts	Causes of hunger, population
Overview	The focus of the module is on the concept of 'food security' and strategies through which this may be attained. As such, the module acts as an introduction to the study of sustainable agriculture in Module 15. The new understanding about population discussed in Module 13 indicated that older traditional views about 'over-population' need to be reviewed. Uncritical

	views about overpopulation are often associated with images of 'famine', 'world hunger' and 'the starving millions'. While these images can be tragically real in times of severe drought, repression and war, they tend to create images of dependency that are not always correct. The relationship between hunger and population levels is not a simple one. For example, population densities in the Netherlands and Singapore are among the highest in the world but few people would say they are over-populated. As a result, many people are asking questions like "What criteria should be used to define overpopulation – and overpopulated in relation to what?" "Why are we growing food for export when local people are hungry?" These questions indicate that we need to take more account of the processes that cause hunger and famine. These processes are also explained in this module.
Learning Outcomes	At the end of this module learners will be able to: • To distinguish between the symptoms and the root causes of hunger and population pressure on food resources; • To better understand perspectives from the South on issues related to population, hunger and food security; and • To appreciate issues and dilemmas in teaching about population and hunger.
Readings	Boucher, D. (ed) (1999) *Paradox of Plenty: Hunger in a Bountiful World*, Institute for Food and Development Policy/Food First, San Francisco. Brown, L.R. (2005) *Outgrowing the Earth. The Food Security Challenge in an*

Age of Falling Water Tables and Rising Temperatures, Earthscan, London.

Delpeuch, F., Maire, B., Monnier, E. and Holdsworth, M. (2009) *Globesity. A Planet Out of Control?* Earthscan

DeRose, L.F., Messer, E. and Millman, S. (1999) *Who's Hungry? and How Do We Know?: Food Shortage, Poverty, and Deprivation*, United Nations University Press.

Gardner, G. and Halweil, B. (2000) *Underfed and Overfed: The Global Epidemic of Malnutrition*, Worldwatch Paper No.150, Worldwatch Institute.

Ingram, J., Ericksen, P. and Liverman, D. (eds) (2010) *Food Security and Global Environmental Change*, Earthscan, London.

Lappe, F.M., Collins J., Rosset, P. and Esparza, L. (1998) *World Hunger: Twelve Myths*, 2nd edition, Grove Press, New York.

Lawrence, G., Lyons, K. and Wallington, T. (eds) (2009) *Food Security, Nutrition and Sustainability*, Earthscan, London.

Moorhead, A. (2009) *Climate, agriculture and food security: A strategy for change*, CGIAR.

Runge, C.F., Senauer, B., Pardey, P.G. and Rosegrant, M.W. (eds) (2003) *Ending Hunger in Our Lifetime: Food Security and Globalization*, International

	Food Policy Research Institute and John Hopkins Universty Press. United Nations Food and Agricultural Organisation (2008) *The State of Food Insecurity in the World 2008*, Food and Agricultural Organisation, Rome. von Grebmer, K. et al. (eds) (2009) *2009 Global Hunger Index*, International Food Policy Research Institute. Wright, J. (2008) *Sustainable Agriculture and Food Security in an Era of Oil Scarcity*, Earthscan, London.
Activities	1. Hunger and malnutrition in the world 2. The root causes of hunger 3. Food First Fundamentals 4. Towards food security for all 5. Reflection

Module 3.2	Population & development
Key Concepts	Global Population Dynamics, human rights
Overview	The topic of Population and Development can be among the most difficult to teach. This is because population issues are related to so many other topics, such as demography, economics, urbanisation, gender, religion, politics, food and nutrition, health and human rights to name just a few. This can make it hard

	to decide where to start, and how to plan a balanced sequence of concepts and themes to match the developmental needs and interests of primary and secondary school students. Population and Development is also a sensitive topic to teach: it involves a consideration of family planning issues – and there are important religious and political views about this in many countries. Teachers also have personal views on these matters, and it is important to be aware of professionally ethical ways of teaching a sensitive topic such as Population and Development. One activity in the module on values education helps clarify appropriate principles for doing this.
Learning Outcomes	At the end of this module learners will be able to: • To recognise major trends and issues in global population dynamics; • To clarify the importance of population issues in relation to sustainable development; • To appreciate the significance of the 'new understanding' of the dynamic population-environment-development interrelationship; • To recognise the significance of gender and human rights in population issues; and • To identify challenges, opportunities and resources for teaching about Population and Development.
Readings	Brown, L., Gardner, G. and Halweilm, B. (1999) *Beyond Malthus: Nineteen*

	Dimensions of the Population Challenge, W.W. Norton, New York. Chapman, A., Morgan, R. Smith and Petersen, R. (eds) (1999) *Consumption, Population, and Sustainability : Perspectives from Science and Religion*, Island Press, Washington DC. GuzmÃ¡n, J.M., Martine, G., McGranahan, G., Schensul, D. and Tacoli, C. (2009) *Population Dynamics and Climate Change*, UNFPA and IIED. Lutz, W., Sanderson, W.C. and Scherbov, S. (eds) (2004) *The End of World Population Growth in the 21st Century*, Earthscan, London. Singh, J.S. (2009) *Creating a New Consensus on Population. The Politics of Reproductive Health, Reproductive Rights, and Women's Empowerment*, Earthscan. UNESCO (1999) *Education and Population Dynamics: Mobilising Minds for a Sustainable Future*, UNESCO, Paris. UNFPA (Annual) *The State of the World Population Annual Report*, United Nations Population Fund, New York. UNFPA and WEDO (2009) *Climate Change Connections. A Resource Kit on Climate, Population and Gender*.
Activities	1. Global population patterns and trends 2. Understanding population growth rates

	3. Population and sustainable development 4. A new understanding of population and development 5. Social development and human rights 6. Reflection

Module 3.3	Culture for a sustainable future
Key Concepts	Relationship between culture, religion and sustainable living
Overview	Our cultural values, which often include particular religious beliefs, shape our way of living and acting in the world. The principles for living sustainably that flow from these and other cultural and religious beliefs vary between groups and countries. They have also changed over time as circumstances demand. Despite this diversity, many principles for living sustainably are shared, not only among indigenous peoples, but also between different religious traditions. This module explores the role of culture and religion in providing guidance on ways of living sustainably. It also provides activities which analyse the place of these themes in the school curriculum.
Learning Outcomes	At the end of this module learners will be able to: • To develop an understanding of the relationship between culture, religion and sustainable living;

	• To explore the principles for sustainable living encouraged in a chosen religion and in a case study from Nepal; • To analyse the relevance and applicability of principles of sustainable living in the Nepal case study; and • To encourage reflection on the contribution of religious education in Education for Sustainable Development.
Readings	Bassett, L. (ed) (2000) *Earth and Faith: A Book of Reflection for Action*, UNEP. Gardner, G. (2002) *Invoking the Spirit: Religion and Spirituality in the Quest for a Sustainable World*, Worldwatch Paper No.164, Worldwatch Institute. Robinson, M. and Picard, D. (2006) *Tourism, Culture and Sustainable Development*, Division of Cultural Policies and Intercultural Dialogue, UNESCO. Schech, S. and Haggis, J. (2000) *Culture and development: a critical introduction*, Wiley-Blackwell. Throsby, D. (2008) *Culture in Sustainable Development: Insights for the future implementation of Article 13* (Convention on the Protection and Promotion of the Diveristy of Cultural Expressions), UNESCO. UNESCO (2000) *World Culture Report*, UNESCO Publishing, Paris. UNESCO (2009) *UNESCO World Report 2: Investing in Cultural Diversity*

	and Intercultural Dialogue, UNESCO Publishing. World Commission on Culture and Development (1995) *Our Creative Diversity*, UNESCO Publishing, Paris. *World Religions and Ecology Series* by Harvard University Press. Mary Evelyn Tucker and John Grim, series editors. • Buddhism – Tucker, M.E. and Williams, D.R. (eds) (1997) • Christianity – Hessel, D. and Ruether, R.R. (eds) (2000) • Confucianism – Tucker, M.E. and Berthrong, J. (eds) (1998) • Daoism – Girardot, N.J., Xiaogan, L. and Miller, J. (eds) (2001) • Hinduism – Chapple, C.K. and Tucker, M.E. (eds) (2000) • Indigenous Traditions – Grim, J. (ed) (2001) • Islam – Foltz, R., Denny, F. and Baharuddin, A. (eds) (2003) • Jainism – Chapple, C.K. (ed) (2002) • Judaism – Tirosh-Samuelson, H. (ed) (2002) • Shinto – Bernard, R. (ed) (2004)
Activities	1. Defining religion and culture 2. Values and principles 3. A case study: Annapurna, Nepal 4. Culture and development 5. Reflection

Module 4	**Teaching & Learning Strategies**
Module 4.1	Experiential learning
Key Concepts	student-centred learning, teaching through experiential approaches
Overview	At the heart of all learning is the way we process our experiences, especially our critical reflections on our experiences. This module introduces experiential education as a key approach to student-centred learning for a sustainable future. Experiential learning engages students in critical thinking, problem solving and decision making in contexts that are personally relevant to them. This approach to learning also involves making opportunities for debriefing and consolidation of ideas and skills through feedback, reflection, and the application of the ideas and skills to new situations.
Learning Outcomes	At the end of this module learners will be able to: • To appreciate the value of student-centred experiential learning; • To analyse the elements of experiential learning; • To develop guidelines for teaching through experiential approaches; and • To relate experiential learning to education for sustainable futures.
Readings	Baker, A.C., Jensen, P.J. and Kolb, D.A. (2002) *Conversational learning: an experiential approach to knowledge creation*, Greenwood Publishing Group. Beard, C. and Wilson, J.P. (eds) (2002) *The power of experiential learning: a*

handbook for trainers and educators, Kogan Page, London.

Itin, C.M. (1999) Reasserting the philosophy of experiential education as a vehicle for change in the 21st century, *Journal of Experiential Education*, 22(2), pp. 91-98.

Kolb, D. (1984) *Experiential Learning: Experience as the Source of Learning and Development*, Prentice-Hall, Englewood Cliffs.

Malinen, A. (2000) *Towards the Essence of Adult Experiential Learning: A Reading of the Theories of Knowles, Kolb, Mezirow, Revans and Schon*, University of Jyvaskyla, Finland.

Miettinen, R. (2000) The concept of experiential learning and John Dewey's theory of reflective thought and action, *International Journal of Lifelong Education*, 19(1), pp. 54-72.

Moon, J.A. (2004) *Handbook of Reflective and Experiential Learning Theory and Practice*, RoutledgeFalmer.

Silberman, M.L. (ed) (2007) *The Handbook of Experiential Learning*, Temple University.

Wessels, M. (2006) *Experiential Learning*, Juta and Co. Ltd.

Whitaker, P. (1995) *Managing to Learn: Aspects of Reflecting and Experiential*

	Learning in Schools, Cassell, London.
Activities	1. Characteristics of experiential learning 2. The experiential learning process 3. Analysing the experiential learning process 4. Understanding the importance of debriefing 5. Reflection

Module 4.2	Storytelling
Key Concepts	Story appreciations, locating and telling stories
Overview	Everyone loves a good story – especially the young people we teach. In fact, being able to tell a story in an interesting and compelling way is an important teaching skill. This is because a good story is not only entertaining but is capable of holding student attention while they learn important concepts, attitudes and skills. In her book, *Earthtales: Storytelling in Times of Change*, Alida Gersie (1992) notes that storytelling relates to current concerns about our future because most stories focus on the Earth, how it was created, and the problems that can arise when we forget the importance of living in harmony with it and each other.
Learning Outcomes	At the end of this module learners will be able to: • To develop an appreciation of stories as educational resources,

	especially as sources of teaching themes that support Education for Sustainable Developments; • To develop skills in locating and telling stories as part of a teaching programme; and • To develop strategies for integrating storytelling approaches into teaching units to achieve the objectives of Education for Sustainable Development.
Readings	Atherton J.S. (2009) Learning and Teaching – Stories, tales and myths in teaching [On-line], UK. Beddes, R. and Johnson C. (eds) (1988) *Only One Earth: A Multimedia Education Pack*, WWF-UK, Godalming, Surrey. Campbell, J. (1988) *The Power of Myth*, Doubleday, London. De Young, R. and Monroe, M. (1996) Some fundamentals of engaging stories, *Environmental Education Research*, 2(2), pp. 171-187. Gersie, A. (1992) *Earthtales: Storytelling in Times of Change*, Green Print, London. Gersie, A. and King. N. (1990) *Storymaking in Education and Therapy*, Jessica Kingsley Publishers, London. Greenaway, R. (2009) Story making and telling for all [Online].

	Kane, S. (1994) *Wisdom of the Mythtellers*, Broodwin Press, New York. Knudston, P. and Suzuki, D. (1992) *Wisdom of the Elders*, Unwin and Allen, Sydney. Livo, N. and Rietz, S. (1986) *Storytelling: Process and Practice*, Libraries Unlimited, Colorado. Mallan, K. (1996) *Storytelling Sourcebook*, Project SARA, Brisbane. McDrury, J. and Alterio, M. (2003) *Learning through Storytelling in Higher Education: Using Reflection & Experience to Improve Learning*, Routledge. Tobias, B. (2008) *Storytelling: storytelling for children aged 2 to 5*, User Friendly Resources. Wright, A. (1995) *Storytelling with children*, Oxford University Press.
Activities	1. Telling a story 2. The value of stories 3. Finding and telling good stories 4. Using indigenous stories 5. Using success stories 6. Reflection

Module 4.3	Inquiry learning
Key Concepts	Inquiry based learning, planning skills
Overview	The development of thinking and problem solving skills is an important objective of Education for Sustainable Development, especially given the urgency of problems facing the world today. These skills can be taught and enhanced through enquiry learning. Enquiry learning is a learner-centred approach that emphasises higher order thinking skills. It may take several forms, including analysis, problem solving, discovery and creative activities, both in the classroom and the community. Most importantly, in enquiry learning students are responsible for processing the data they are working with in order to reach their own conclusions. This module clarifies the characteristics of enquiry learning and illustrates strategies for teaching through enquiry-based approaches.
Learning Outcomes	At the end of this module learners will be able to: • To develop an understanding of enquiry-based teaching and learning strategies; • To develop skills in planning for enquiry-based learning; and • To illustrate ways of evaluating enquiry-based teaching and learning.
Readings	Barrett,T., MacLabhrainn, I. and Fallon, H. (eds) (2005) *Handbook of Enquiry and Problem-based Learning. Irish Case Studies and International*

Perspectives, AISHE, Released under Creative Commons Attribution-NonCommercial-ShareAlike 2.0 licence.

Boud, D. and Feletti, G. (1997) *The Challenge of Problem-based Learning* (2nd Edition), Routledge.

Duch, B.J., Groh, S.E. and Allen, D.E. (eds) (2001) *The Power of Problem-Based Learning*, Stylus Publishing.

Gough, N. (1992) *Blueprints for Greening Schools*, Gould League, Melbourne

Hutchings, W. (2007) *Enquiry-Based Learning: Definitions and Rationale*, University of Manchester.

Hutchings, W. (2007) *The philosophical bases of Enquiry-Based Learning*, University of Manchester.

Jaques, D. and Salmon, G. (2007) *Learning in groups: a handbook for face-to-face and online environments* (4th Edition), Routledge.

Kahn, P. and O'Rourke, K. (2004) *Guide to Enquiry-Based Learning*, University of Manchester.

Lambros, A. (2002) *Problem-based learning in K-8 classrooms: A Teacher's Guide to Implementation*, Corwin Press.

Schwartz, P., Mennin, S. and Webb, G. (eds) (2001) *Problem-based learning:*

	*case studies, experience and practic*e, Routledge.
Activities	1. A spinning world 2. Recognising enquiry-based learning 3. Mapping Pollution: An example of enquiry learning 4. A model for enquiry learning 5. Reflection

Module 4.4	Future Problem Solving
Key Concepts	futures perspective, Future Problem Solving strategy
Overview	Future Problem Solving is a strategy for helping students develop skills for analysing a problem. Working through a six step process can help them decide – from a futures perspective – what should be done about a problem. The six steps are: • Identifying possible causes and effects of a problem • Identifying the underlying problem • Brainstorming potential solutions • Developing criteria for evaluating solutions • Evaluating all solutions to determine the best one • Developing an action plan As well as developing problem solving skills, this teaching strategy also helps students to develop an interest in the future and improve their research, group

	work and communication skills. The problem chosen to illustrate the Future Problem Solving strategy in this module is waste management, a problem that is becoming increasingly serious because the amount of waste is growing all around the world. Solutions to the problems of both solid and chemical waste are considered in this module.
Learning Outcomes	At the end of this module learners will be able to: • To appreciate the importance of integrating a futures perspective • To develop expertise in using Future Problem Solving as a teaching strategy • To plan ways of using the Future Problem Solving strategy when teaching other topics
Readings	_____ (1997) Trash – Heaps of Trouble, *New Internationalist*, No. 295. _____ (1999) Hazardous Waste, *Our Planet*, No. 104. Barrett,T., MacLabhrainn, I. and Fallon, H. (eds) (2005) *Handbook of Enquiry and Problem-based Learning. Irish Case Studies and International Perspectives*, AISHE, Released under Creative Commons Attribution-NonCommercial-ShareAlike 2.0 licence. Boswell, R. (1998) *Learning Theme Packs*, Future Problem Solving Program, Ann Arbor. Crabb, A. (1998) *The Coach's Guide to Future Problem Solvers Program*,

	Future Problem Solving Program, Ann Arbor. Crabb, A. (n.d.) *Problem Solving Across the Curriculum*, Future Problem Solving Program, Ann Arbor. Crabb, A. (n.d.) *Student Guide Workbook*, Future Problem Solving Program, Ann Arbor.
Activities	1. Fantasy voyage 2. Waste problems 3. Future Problem Solving 4. Reflectionhttp://www.unesco.org/education/tlsf/mods/theme_d/mod23.html?panel=5 - top

Module 4.5	Learning outside the classroom
Key Concepts	risk management, strategies for teaching and learning outside the classroom
Overview	This module provides examples of ways that learning outside the classroom can be used to facilitate Education for Sustainable Development. This includes short visits into the school grounds and local community, as well as visits to farms, factories, offices, neighbourhood science centres and natural settings such as a forest, a beach or a national park. Providing students with high quality learning activities in relevant situations

	beyond the walls of the classroom is vital for helping students appreciate their first hand experiences from a variety of different perspectives. Experiences outside the classroom also enhances learning by providing students with opportunities to practice skills of enquiry, values analysis and clarification and problem solving in everyday situations. However, taking students outside the classroom requires careful planning of the learning activities and attention to the health and safety risks that might be faced. This module provides guidance on these aspects of planning for learning outside the classroom.
Learning Outcomes	At the end of this module learners will be able to: • To develop an awareness of the positive impact that experiences outside the classroom can have on Education for Sustainable Development; • To develop an understanding of the planning, organisation and risk management required for teaching and learning outside the classroom; and • To identify appropriate strategies for teaching and learning outside the classroom.
Readings	_____ (2000) Focus on Fieldwork: Special Issue, *Teaching Geography*, 25(2). Department for Education and Employment (1998) *Health and Safety of Pupils on Educational Visits*, HMSO, London. Department for Education and Skills (2006) Learning Outside the Classroom

	Manifesto, Learning Outside the Classroom. Department for Education and Skills & Department for Culture, Media and Sport (2006) Laying the foundations: Using the built environment to teach. DeWitt, J. and Storksdieck, M. (2008) A short review of school field trips: key findings from the past and implications for the future, *Visitor Studies*, 11(2), pp. 181-197. Laws, K. (1989) Learning geography through fieldwork, in Fien, J., Gerber, R. and Wilson, P. (eds) *The Geography Teacher's Guide to the Classroom*, 2nd edition, Macmillan, Melbourne. Rogers, A. (ed) (1995) *Taking Action: An Environmental Guide For You and Your Community*, United Nations Environment Programme, Nairobi. Smith, M. (2002) Exploring a changing world: A guide to fieldwork for youth expeditions, Young Explorers Trust.
Activities	1. Learning in the local area 2. Approaches to learning outside the classroom 3. Planning for learning outside the classroom 4. Risk management 5. Reflectionhttp://www.unesco.org/education/tlsf/mods/theme_d/mod23.html?panel=5 - top

Module 4.6	Community Problem Solving
Key Concepts	Community Problem Solving, learning strategies
Overview	This module introduces Community Problem Solving as a teaching and learning strategy. As such, it is the 'practical' application module that builds on the ideas for citizenship education developed in Module 7. It also draws on the ideas about experiential, enquiry and values education, Future Problem Solving and learning outside the classroom in other modules. Community Problem Solving provides students with an opportunity to practice the skills that are needed to participate in finding solutions to the local issues that concern them. This helps to develop the important citizenship objectives of learning for a sustainable future and integrates skills – for both students and teachers – of using experiential and enquiry-based strategies. It also integrates skills in the planning of values clarification and values analysis with the possible solutions so students can take action to help achieve a sustainable future.
Learning Outcomes	At the end of this module learners will be able to: • To develop an understanding of Community Problem Solving, especially as it may be used in education for sustainable futures. • To identify the skills students need to participate in Community Problem Solving. • To explore questions and issues that may be encountered when

	teaching through Community Problem Solving. • To identify teaching and learning strategies that may be used as part of a Community Problem Solving project.
Readings	Barrett,T., MacLabhrainn, I. and Fallon, H. (eds) (2005) *Handbook of Enquiry and Problem-based Learning. Irish Case Studies and International Perspectives*, AISHE, Released under Creative Commons Attribution-NonCommercial-ShareAlike 2.0 licence. Bardwell, L., Monroe, M. and Tudor, M. (1994) *Environmental Problem Solving: Theory, Practice and Possibilities in Environmental Education*, North American Association for Environmental Education, Troy, Ohio. Bull, J., Cromwell, M., Cwikiel, W., Di Chiro, G., Guarina, J., Rathje, R., Stapp, W., Wals, A. and Youngquist, M. (1988) *Education in Action: A Community Problem Solving Program for Schools*, Thomson-Shore, Dexter, Michigan. Hungerford, H. *et al*. (1988) *Investigating and Evaluating Environmental Issues and Actions: Skill Development Modules*, Stripes Publishing Company, USA. Jensen, B.B. and Schnack, K. (1997) The action competence approach in environmental education, *Environmental Education Research*, 3(2), pp. 162-178. McCain, T. (2005) *Teaching for tomorrow: teaching content and problem-solving skills*, Corwin Press.

	OECD (1995) *Environmental Education for the 21st Century*, OECD, Paris. Rogers, A. (ed) (1995) *Taking Action: An Environmental Guide For You and Your Community*, United Nations Environment Programme, Nairobi. Stapp, W., Wals, A. and Stankorb, S. (eds) (1996) *Environmental Education for Empowerment*, Kendall/Hunt, Dubuque. Wals, A. (1994) Action Research and Community Problem-solving: environmental education in an inner-city, *Journal Educational Action Research*, 2(2), pp. 163-182
Activities	1. Local concerns 2. What is Community Problem Solving? 3. Developing students' skills 4. Planning to use Community Problem Solving 5. Reflectionhttp://www.unesco.org/education/tlsf/mods/theme_d/mod23.html?panel=5 - top

Course Syllabus

Course No.: (107751)
No. of credit hours: 3
Sustainable Development in the Arab World
Hashemite University, Faculty of Arts, Department of Humanities & Social Sciences,
Fall Semester, 2014-2015

Instructor Information

Instructor: Dr. Yahya A. Ali
Office Location: Arts 307
Telephone: Ext. 4453
Office Hours: Thu, 11-1PM & by appointment
E-mail: ykali@hu.edu.jo
Website:

Course Description/Overview:

This course reviews the concept of sustainable development including the three pillars of sustainable development: economic, environmental and social aspects. The course focuses on the basic concepts of economic development based on the assessment of the cost and benefit, and its practical application. Moreover, the course examines the role of individuals, governments, and the public and private sectors in addition to the multilateral donor institutions. The determinants of activation models of sustainable development will be specified and discussed. The course focuses on issues of sustainable development in the Arab world, including population, sustainable consumption, institutional response and growth management.

Course Learning Objectives

This course aims to achieve the following objectives:
1. identify the economic and social indicators for sustainable development
2. identify some of the terminology used in this area and its implications.
3. study and analyze the strategies of sustainable development.
4. recognize the importance of sustainable development in the Arab World.
5. determine the impacts of population and natural resources on the development process.
6. identify practical ways to achieve sustainable development.

Course requirements:
1. Submit a research paper discusses and analyzes a topic chosen by the student within the main themes of the course in coordination with the instructor.
The student has to submit a proposal of his research paper in the fourth week of the season.

A date will be set to view the paper during the last two weeks of the season.
2. There will be a discussion and analysis of a topic from the course's topics by two students every week and this activity will be clarified in the class. The results of the discussion and analysis should be submitted the day before the date of the next class.
3. Participation and debate is an essential part in the evaluation.

Course content:

Week	**Topic**
1 & 2	• Introduction and organization of work throughout the semester • A general introduction on sustainable development
3	• Concepts and terminology • Environmental challenges and their influence in Arab countries • Challenges of economic security • Occupation and military intervention and its impact on humans and the environment • Energy, water, population, natural resources and development
4	• Presentations of proposals
5	• Development and environment
6	• Security and development
7	• Globalization and sustainable development
8	• Strategies of sustainable development
9	• Economic and social indicators of sustainable development

10	• The need for sustainable development in the Arab countries
11	• Biodiversity, ozone layer, climate change
12	• Solid waste and hazardous waste
13	• Environmental Impact Assessment and Environmental Management
14	• Media and environmental awareness
15	• Research paper presentation
16	• Research paper presentation

Evaluation:

Course work	%
Research paper	30
Weekly commentaries	20
Participation	10
Final Exam	40
Total	100

Texts and supplementary material:

- Arabic Encyclopedia of knowledge for sustainable development. 2006 vol.(1.2). Editor: Mostafa Tolba. Arab Scientific Publishers, Beirut, Lebanon.
- United Nations Development Program. Arab Human Development Report for 2009.

- Munier, Nolberto. 2005. Introduction to Sustainability: Road to a Better Future. Springer: The Netherlands.
- Lele, Sharachchandra M., Sustainable Development: A Critical Review," *World Development*, 19, 607-621, 1991.
- Norgaard, Richard B., "Sustainable Development: A Co-Evolutionary View," *Futures*, December 1988, 606-620.

- Rees, William, “Revisiting Carrying Capacity: Area-Based Indicators of Sustainability,” *Population and Environment: A Journal of Interdisciplinary Studies*, Vol. 17, No. 3, January 1996, 195-215.
- Buttel, Frederick, Ann P. Hawkins and Alison G. Power, “From Limits to Growth to Global Change,” *Global Environmental Change*, December 1990, 57-66.
- Luten, Daniel, “The Limits-to-growth Controversy,” Chapter 8 in *Sourcebook on the Environment,* edited by Kenneth A. Hammond, George Macinko, Wilma B. Fairchild, the University of Chicago Press, 1978.
- Stockdale, Jerry, “Pro-Growth, Limits to Growth, and a Sustainable Development Synthesis,” *Society and Natural Resources,* Vol. 2, 161-176, 1989.
- Dietz, Thomas, and Eugene A. Rosa, “Effects of Population and Affluence on CO2 Emissions,” *PNAS* Vol. 94, 1997, 175-179.
- Dietz, Thomas, and Eugene A. Rosa, “Rethinking the Environmental Impacts of Population, Affluence and Technology,” *Human Ecology Review*, Summer/Autumn, 1, 1994, 277-300.
- Dunlap, Riley E., “The Nature and Cause of Environmental Problems: A Social-Ecological Perspective,” *Environment and Development: A sociological Understanding for the Better Human Conditions, Chapter 3,* Seoul Press, 1994, 45-84.
- Mazur, Allan, “How Does Population Growth Contribute to Rising Energy Consumption in America?” *Population and Environment: A Journal of Interdisciplinary Studies,* Vol. 15, No. 5, 1994, 371-378.
- Shaw, R. Paul, “Rapid Population Growth and Environmental Degradation: Ultimate *versus* Proximate Factors,” *Environmental Conservation,* Vol. 16, No. 3, 1989, 199-208.
- Rosa, Eugene A., and Gary E. Machlis, “Energetic Theories of Society: An Evaluative Review,” *Sociological Inquiry,* 53: 152-178, 1983
- Rosa, Eugene A., Gary E. Machlis, and Kenneth M. Keating, “Energy and Society,” *Annual Review of Sociology*, 1988, 14: 149-172

- Barbosa, Luiz C., “The People of the Forest Against International Capitalism: Systemic and Anti-Systemic Forces in the Battle for the Preservation of the Brazilian Amazon Rainforest, “ *Sociological Perspective*, Vol. 39, No.2, 1996, 317-331.
- Goldblatt, David, “The Political Ecology of Capitalism: Andre Gorz,” chapter 3 in *Social Theory and the Environment*, 1996, 74-111.
- O’Conner, James, “is Sustainable Capitalism Possible,” Chapter 8 in *Food for the Future: Conditions and Contradictions of Sustainability,* Ed by Patricia Allen*,* 1983, revised in 1994, 152-175.
- Schnaiberg, Allan, “The Political Economy of Environmental Problems and Policies: Consciousness, Conflict, and Control Capacity,” *Advances in Human Ecology,* Vol. 3, 1994, 23-64.
- Smith, David, “Uneven Development and The Environment: Toward a World-System perspective,” *Humboldt Journal of Social Relations,* Vol. 20:1, 1994, 151-175.
- Dietz, Thomas, and Linda Kalof, “Environmentalism Among Nation-states,” *Social Indicators Research*, 26” 353-366, 1992.
- Anderton, Douglas, Andy B. Anderson, John Michael Oakes, and Michael R. Fraser, “Environmental Equity: The Demographics of Dumping,” *Demography,* Vol. 31, No. 2, 1994.
- Oakes, John Michael, Douglas L. Anderton, and Andy B. Anderson, “A Longitudinal Analysis of Environmental Equity in Communities with Hazardous Waste Facilities,” *Social Science Research* 25, 125-148, 1996.
- Taylor, Dorceta E., “The Rise of the Environmental Justice Paradigm,” *American Behavioral Scientist,* Vol. 43, No. 4, January 2000, 508-580.

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than 2 classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 10% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Course	Environmental Spatial and Temporal Variability
Module 1	**Regionalized variable**
Key Concepts	Spatial and temporal variability
Overview	Students are asked to distinguish between non-regionalized and regionalized

	variables. Question raise upon why environmental properties vary from space to another and with time? And how can we estimate these variations? Is there a concept governing their variance? Is it booming independence of time and space? What are the nature and governing forces that may lead to such variabilities? The group discussions will let understand the various types of existing variables and how to characterize and explore these variables. However, the word "curriculum" means more things.
Aim	The overriding aim of this module is to improve student's capability to understand various terminologies used for regionalized variables and the theories behind their existence. Students should be able to provide tools to characters these variabilites depending on variable type using various tests and hypotheses.
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss the different types of regionalized variables. • Capable to characterise any variable using measures of central tendency, measures of dispersion, measures of shape, outliers, probability distributions, and test of normality.
Units	Unit 1.1: Theories of Statistics, Unit 1.2: Observations and variables, Unit 1.3: Data presentation of one variable, two variables, three variables, and Unit 1.4: Regionalized variables. Unit 1.5: Population and sampling theory. Unit 1.6: measures of central tendency, dispersion, and shape. Unit 1.7: Identification of outliers and testing of normality.
Readings	1. Donald Nielsen. 2003. Spatial and Temporal Statistics. Sampling Field Soils and Their Vegetation. GeoEcology, Germany. 2. John C. Davis. 2002. Statistics and data analysis in geology. Wiley, John & Sons, Incorporated.
Activity	**Overview**

	Assignment 1.2: Reflect on statistical theory 1. Provide ten examples on each type of variables within a class room? 2. How can you determine the type of presentation required? (3-4 paragraphs). 3. What your opinion about the following statement “discoveries are always made from outliers”. Assignment 1.2: Practical application using the provided set of data. Test the normality of the system? What is the measures of central tendency suggests in this data? Can you find any outlier within the set of data? If the outlier was neglected, can you state the normality status.
Module 2	**Data Exploration and Mining**
Key Concepts	Spatial and temporal Modeling

Overview	Students are introduced to varous avialable modeling techniques starting from simple linear regression, curve fitting, advance data mining technqiues (e.g. decision trees, multi-linear models, screening, partitionning, cluster, and artificial neural netowrk). Question raised is why there are many models available in nature? Does the existance of each entitiy (its growth or decay) varies by entity type? Or its interaction with nature is different? Questions raised in terms of how can we decide which model is the most appropriate. In answers to these questions, students are introduced to conept of model capability in terms of root mean square error (RMSE), coefficient of determination, and the confidence interval of current and future predictions. The choose of best model will initially depend on the data type and category followed by best model capability of prediction.
Aim	The overriding aim of this module is to provide advance modelling techniques that is used internationally to predict current and future magnitudes and trends in nature.
Learning Outcomes	At the end of this module learners will be able to: • Explore most familiar models used in statistics. • Understand the nature of each model category and the benefit of each model. • Improve their computer skills using advance modelling programs as JMP from SAS.
Units	Unit 2.1: regression model analyses. Unit 2.2: curve (non-linear) fitting. Unit 2.3: advance data mining technqiues Unit 2.4 The prediction capability Unit 2.5 Selection of best model

Readings	1. Donald Nielsen. 2003. Spatial and Temporal Statistics. Sampling Field Soils and Their Vegetation. GeoEcology, Germany. 2. Hands-out prepared by the instructor for the class 3. JMP help file, 2008. SAS, USA.
Activity	**Overview**
	Assignment 2.1: Improving skills using attached set of data: 1. test of all of the following models for the set of data; simple linear regression, curve fitting, advance data mining technqiues (e.g. decision trees, multi-linear models, screening, partitionning, cluster, and artificial neural netowrk). 2. Conduct testing for the model prediction capability? What can you interfere? 3. IF you have to choose between these models, which model you will select and why? 4. If the modeler is interested in simple modeling, can you decide what are the limitations of the application of such model? Assignment 2.2: Compare the models introduced in this course with other models in literature and/or within different faculties. What do you suggest? Do you think most applied models are linear or non-linear, and why?
Module 3	**Spatial and temporal modeling and interpolation**
Key Concepts	**Autocorrelogram and semivariogram, estimation and interpolation, IWD, Kriging, ARIMA.**

Overview	Students are introduced in distinguishing between correlation and semivariance, taking into account the variation with distance. Students are also introduced on how to characterize a regionalized variable. Questions raised are how many Autocorrelograms and variograms exist in nature? Do these tools provide indication of environmental facotrs governing the distribution of the tested property? Practical application will demonstrate various spatial characterization of actual tested properties in the country. Similarly, students are questioned on how to quantify the spatial extent of the property in nature prom known measured points to estimate non-measured points. In a group discussion, students will encage in various theories and practical applications of each interpolation techniques and questions raised on the limitation of each theory. Theories of weighting factors, corner point technique, inverse distance technique, variogram weighting factor technique, punctual kriging, block kriging, universal kriging, indicator kriging, practical examples. If a temporal variable is used, can these variables be tested as spatial or regionalized variables? How can we test temporal variables? Students are engagaed in new terminologies of time scale variability, choosing the best fit, ARIMA, Seasonal ARIMA, with temporal applications of actual data sets. Questions may raise the difficulty to have a property that is both spatial and temporally variable. How can we test and predict such a variable? Is there any model that incorporate regionalized and temporal variables?
Aim	This module aims to have advance understand of modelling of both regionalized and temporal variables. Characterizing the nature governing their spatial and temporal distribution and theories for quantification the magnitude of existence using advance interpolation and extrapolation techniques.

Learning Outcomes	At the end of this module learners will be able to: • Distinguish between regionalized and temporal variables • Characterize the spatial dependence and direction of influence of spatial property. • Able to define best semivariogram model that govern its spatial behaviour. • Determine the best theory to interpolate and extrapolate the magnitude of existence. • Predict the temporal variability of a property with emphasis of future prediction.
Units	Unit 3.1: Autocorrelation analysis Unit 3.2: Autocorrelation and correlograms Unit 3.3: Estimation, interpolation and extrapolation Unit 3.4: Temporal Analyses and ARIMA. Unit 3.5: Importance of spatial and temporal prediction as a EIA tool.
Readings	1. Donald Nielsen. 2003. Spatial and Temporal Statistics. Sampling Field Soils and Their Vegetation. GeoEcology, Germany. 2. Isobel Clark. Practical Geostatisitcs. 3. John C. Davis. 2002. Statistics and data analysis in geology. Wiley, John & Sons, Incorporated. 4. Wellmer, F.W. 1998. Statistical Evaluations in Exploration for Mineral Deposits. Springer, Berlin. 5. Soil Science Society of America (SSSA). 1996. Applications of GIS to the Modeling of Non-Point Source Pollutants in the Vadose Zone. Special Publication Number 48. Madison, Wisconsin, USA.
Activity	**Overview** Assignment 3.1: Practical applications for environmental pollution for both land and groundwater from several point and non-point sources. 1. Using the attached data, can you characterize the spatial and temporal

	extent and behavior of the pollution in the study area? 2. Can you decide what factors that may cause such spatial distribution? 3. Using appropriate interpolation techniques, can you estimate the extent of the pollution at the basin? And how can you control such pollution? *4.* In term of pollution reserve calculation, can you predict various scenarios if adaptive plans are used? Assignment 3.2: Environmental sustainability Can you provide at least 4 national and international studies that implies the use of spatial and temporal modeling for EIA and Environmental sustainability? Discuss the theories used by each case, from your stand point can you define he advantages and weaknesses of the models used?
Module 4	**Climate Change and Modeling**
Key Concepts	climate change impacts, vulnerability assessment, and future prediction for strategic planning
Overview	Worldwide, climate change is consider one of the major threat that may affect a country with risks degrees varies spatially and temporally according to human abuse of nature. Students are initially overviewed of Climate Change Variability with emphasis on actual evidences. Questions raised on how the GHGs may interact with any environmental property on earth? How can we test the effect of these gases on climatic variability? What are the expected impacts of climate change and how it vary from one place to another? In accordance to above, students are introduced to IPCC and UNFCCC and associated protocols and COP meetings. The students are introduced to all national communication reports issued to the context of UNFCCC. Students are viewed with climate change modelling Techniques, Climate Models and their Evaluation, Global and Regional Climate Projections, and Applications in Climate Change Modelling. Questions raised on how these models vary from introduced models? What are the uncertenity levels

	associated with these models and how can why reduce these assocatiated errors?, In addition, in a group discussion, students are allowed to integrate the knowledge of all management practices taken over other classes to provide several adaptation and Mitigation of Climate Change. Question raised on how can we deiced on which measure to use? IS there a criteria applicable for BMP. And finally, how do these models and prediction as a decision tools can be useful for Capacity Development for Innovation, formulating legislations and policies, and how can they be integrated into strategic planning and action plans that ensures sustainable environmental development of the country?
Aim	This module aims to understand the capability of the modelling concepts to derive adaptation and mitigation plans and formulation into policies and strategies based on sustainability issues.
Learning Outcomes	At the end of this module learners will be able to: • Understand the science behind the climate change and weather variability. • Able to define and prioritize adaptation and mitigation measures based on existing impacts. • Able to use the modelling concept to have a decision tools for future scenarios that govern the existing historic variability. • Capable to formulate according to climatic scenarios and adaptation scenarios the appropriate strategic planning for sustainable development.
Units	Unit 4.1: Overview of Climate Change Variability *Unit 4.2:* Climate change Impacts Unit 4.3: climate change modelling Techniques Unit 4.4: Global and Regional Climate Projections Unit 4.5: Adaptation and Mitigation of Climate Change, Unit 4.6: Capacity Development and strategic maninstreamin.

Readings	1. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.) (2007). Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 2. J.T. Houghton, Y. Ding D.J. Griggs, M. Noguer, P.J. van der Linden, X. Dai, K. Maskell, and C.A. Johnson (Eds). Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change Published for the Intergovernmental Panel on Climate Change. Cambridge University Press. 3. Bert Metz, Ogunlade Davidson, Jan-Willem Martens, Sascha Van Rooijen and Laura Van Wie Mcgrory (Eds.) (2000). Methodological and Technological Issues in Technology Transfer. IPCC. Cambridge University Press, UK. pp 432. 4. Nebojsa Nakicenovic and Rob Swart (Eds.) (2000). Emissions Scenarios. IPCC. Cambridge University Press, UK. pp 570. 5. JT Houghton, LG Meira Filho, J Bruce, Hoesung Lee, BA Callander, E Haites, N Harris and K Maskell (Eds). (1994). Radiative Forcing of Climate Change and An Evaluation of the IPCC IS92 Emission Scenarios. IPCC, Cambridge University Press, UK. pp 339. 6. IPCC Fifth Assessment Report: Climate Change 2013 (AR5) 7. IPCC Fourth Assessment Report: Climate Change 2007 (AR4) 8. IPCC Third Assessment Report: Climate Change 2001 (TAR) 9. IPCC Second Assessment Report: Climate Change 1995 (SAR) 10. IPCC First Assessment Report 1990 (FAR) 11. First National Communication to the United Nations Framework Convention on Climate Change (UNFCCC). http://www.moenv.gov.jo/En/Agreements/Documents/first%20national%20communication.pdf

	12. Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC). 2009. http://unfccc.int/resource/docs/natc/jornc2.pdf 13. The National Climate Change Policy and Sector Strategic Guidance Framework of the Hashemite Kingdom of Jordan (2013-2020). http://www.jo.undp.org/content/dam/jordan/docs/Publications/Climate%20change%20policy_JO.pdf 14. Third Country Report on The Implementation of the United Nations Convention to Desertification Combat (UNCCD). http://www.moenv.gov.jo/En/EnvImpactAssessmentStudies/Documents/jordan-eng.pdf 15. National Strategy And Action Plan To Combat Desertification (2006). The Hashemite Kingdom Of Jordan, Ministry OF ENVIRONMENT. http://ag.arizona.edu/oals/IALC/jordansoils/_html/NAP.pdf
Activity	**Overview** *Assignment 4.1: Taking Climate Change Threat Seriously* 25. Looking over 1st and 2nd national communications to climate change to UNFCCC, can you define what are the degree of uncertainty associated in applied models used to derive future scenarios and predictions? 26. If RCM are used instead of GCM, how do you think the adaptation plans might be changed? 27. Test another parameter that wasn't introduced in these communications, can you suggest better recommendations? 28. Looking over desertification in Jordan, can you suggest s synergetic themes between climate change and desertification adaptation and mitigation options? Looking over 1st communication of Jordan to UNCD and the strategic plan, can you reference the modelling categories

used? And how can you improve these models?

Assignment 4.2: Practical application from current weather data to set future 3rd national communication.

1. Use the available data to interpret the extent of spatial and temporal variability of weather data to inform about possible impacts of climate change on various sectors (agriculture, water, energy, transportation, health, etc).
2. IF RCM is used following IPCC 2013, can you determine best adaptation and mitigation plans (look at attached pdf files)?
3. How can formulate the national climate change policy into effective strategic plan taking further step in what is called NAPA?

Course Syllabus

Course Number: 111202411
Environmental Spatial and Temporal Variability

The Hashemite University, Faculty of Natural Resources and Environment,
Department of Land Management and Environment,
Spring Semester, 2014-2015

Instructor Information

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Course Identification

Course Number:	111202411
Course Name:	Environmental Spatial and Temporal Variability
Course Location:	University Campus
Class Times:	Sunday and Tuesday 12:00pm – 13:00pm
Prerequisites:	Environmental Science (111203231) and GIS (111203243)
Faculty Web Page:	http://www.hu.edu.jo

Course Description/Overview

The course aims to introduce students to the concept of regionalized variables and the available international modelling approaches used to quantify these variabilities. In addition, the course aims in educating the students with the concept of interpolation using kriging techniques and future prediction using advance mathematical modelling techniques as ARIMA.

The course also aims to educate and train students on the cabailities of the spatial and temporal models to be implemented as an environmental impact assessment technqiue to any risk that may threat either natural or human entities. With emphasis on policy oriented research, the course aims in providing various skills to ensure proper land, water, and environmental management planning and sustainable development through practical applications for various measures obtained from governmental and research institutional units.

In order to increase the awareness of the students of the climate change threats to the fragile environmental systems of the country (including land, water, and biodiversity), the course concentrate on climate change and overviews the climatic variability in all its associated components providing evidencing of climate variability. also, the section overviews the capability of the spatial and temporal modelling to access climate change impacts (e.g. drought, floods, etc), to estimate the vulnerability of the targeted systems, and to provide adaptation and mitigation options and measures that facilitate further sustainable development of the country towards equitable climate-compatibility.

Final section focuses on importance of modeling in mainstreaming policies and strategies at both national and international levels with issues related to climate change and sustainable human development. Finally, the course provides analysis and interpretation of large-scale variability and observed climate change, identifying trend analyses and description of atmosphere Behavior with overviews of numerical modeling and numerical weather prediction as GCM, RCM, stochastic models, and downscaling. Using participatory techniques, such as focus group discussions and individual interviews students are involved in gathering and identifying further challenges, limitations, obstacles and barriers to achieve the sustainability of the country various natural systems.

Course Learning Objectives

The overarching goals of this course are: a) to provide several approaches to model, estimate, and predict future spatial and temporal variability using simple and advanced statistical and data mining techniques; b) raise awareness of the students on climate change vulnerability and the capability of spatial and temporal models for future planning, sustainable management, and strategic development; and c) use available statistical tools to conduct environmental impact assessments for any system, and to identify and quantify threats, risks and constrains allocated within the environmental entity.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

60. Distinguish between statistical methodologies and approaches to analyse the regionalized variable spatially and temporally based on the data types.
61. Use the available softwares to derive and conduct environmental impact assessment for any system, and to quantify threats, risks and constrains allocated within the environmental entity.
62. Improve intellectual and practical skills through practical applications of actual national and international case studies.
63. Improve the awareness of the modelling and its vital role in estimating the impacts and vulnerability assessments of the system for climate change threats.
64. Improve and broaden students knowledge towards the importance of spatial tools to mainstream climate change policy and strategy

Course Resources

Course Website(s)

1. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.) (2007). Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
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3. Bert Metz, Ogunlade Davidson, Jan-Willem Martens, Sascha Van Rooijen and Laura Van Wie Mcgrory (Eds.) (2000). Methodological and Technological Issues in Technology Transfer. IPCC. Cambridge University Press, UK. pp 432.
4. Nebojsa Nakicenovic and Rob Swart (Eds.) (2000). Emissions Scenarios. IPCC. Cambridge University Press, UK. pp 570.
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6. **IPCC Fifth Assessment Report: Climate Change 2013 (AR5)**
7. **IPCC Fourth Assessment Report: Climate Change 2007 (AR4)**
8. **IPCC Third Assessment Report: Climate Change 2001 (TAR)**
9. **IPCC Second Assessment Report: Climate Change 1995 (SAR)**
10. **IPCC First Assessment Report 1990 (FAR)**

Internet Link(s)

1. http://unfccc.int/2860.php
2. http://www.ipcc.ch/
3. http://www.epa.gov/climatechange/links.html
4. http://cdiac.ornl.gov/pns/gcclinks.html
5. http://www.climateark.org/links/
6. http://www.linktv.org/climatechange
7. http://www.unep.org/
8. http://www.wmo.int/
9. http://www.un.org/
10. http://www.un.org/wcm/content/site/climatechange/gateway
11. http://www.ipcc-data.org/
12. http://www.cbd.int/
13. http://www.unccd.int/en/Pages/default.aspx
14. http://www.giss.nasa.gov/projects/gcm/

15. http://lcluc.umd.edu/
16. http://daac.ornl.gov/daacpages/mercury.html
17. www.aip.org/history/climate/GCM.htm
18. www.realclimate.org/index.php/.../general-circulation-model-gcm/

Required Course Texts and Materials

1. Donald Nielsen. 2003. Spatial and Temporal Statistics. Sampling Field Soils and Their Vegetation. GeoEcology, Germany.
2. Hands-out prepared by the instructor for the class

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5. John C. Davis. 2002. Statistics and data analysis in geology. Wiley, John & Sons, Incorporated.
6. Roussos Dimitrakopoulos. 1993. Geostatistics for the next century. Kluwer
7. Rawlings, J.O, S.G. Pantula, and D.A. Dickey. 1998. Applied Regression Analysis: A Research Tool. Second Ed. Springer-Verlag, New York, Inc.
8. Wellmer, F.W. 1998. Statistical Evaluations in Exploration for Mineral Deposits. Springer, Berlin.
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10. J. David Neelin. Climate Change and Climate Modeling. Cambridge University Press. (January 31, 2011), 1 edition.
11. Angel Utset. Climate Variability, Modeling Tools and Agricultural Decision-Making (Climate Change and Its Causes, Effects and Prediction). Nova Science Publishers, Inc. April 30, 2009, 1 edition.

12. Decade-to-century-scale climate variability and change a science strategy. National Research Council (U.S.). Panel on Climate Variability on Decade-to-Century Time Scales. National Acacemy Press, Washington, D.C. : 1998.
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16. Burroughs, William James (2001) Climate Change: a multidisciplinary approach. Cambridge University Press, Cambridge; New York.
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18. Advances in global change research (2001). Remote sensing and climate modeling synergies and limitations. Kluwer Academic Publishers, Dordrecht; Boston.
19. Climate change and developing countries (2002). Advances in global change research. Ravindranath, N. H. Kluwer Academic Publishers, Dordrecht, Boston.
20. The encyclopedia of weather and climate change: a complete visual guide (2010). Weather and climate change. University of California Press, Berkeley, Calif.
21. Climate change: a multidisciplinary approach. Burroughs, William James. Cambridge University Press, Cambridge; New York.
22. Climate Change Vulnerability and Adaptation in Asia and the Pacific (2010). Lin Erda, William C. Bolhofer, Saleemul Huq, Stephanie Lenhart, Shishir K. Mukherjee, Joel B. Smith, Joe Wisniewski. Springer,
23. Climate Change: Impacts, Adaptation and Vulnerability: Summary for Policymakers, a Report of Working Group II of the Intergovernmental (2007). Wmo Records.
24. Climate policy after Kyoto. United Nations Framework Convention on Climate Change (1992). Protocols, etc. 1997 Dec. 11.
25. Understanding climate change feedbacks (2003). National Academies Press, Washington,

D.C.
26. Climate change and global crop productivity (2000). Publication: CABI Pub., Wallingford, Oxon, UK; New York, NY.
27. Climate Change and Adaptation Strategies for Human Health (2006). Bettina Menne, Kristie L. Ebi. Steinkopff.
28. Adaptation to Climate Change: A Spatial Challenge (2009). Rob Roggema. Springer, Drodrecht.
29. Adapting to Climate Change: Thresholds, Values, Governance (2010). Adger, Dr Irene Lorenzoni and Karen L. O'Brien. Cambridge University Press, Cambridge, UK.

Assignments and Grading Scheme

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following:

First Hour Exam	10%
Second Hour Exam	10%
Laboratory	15%
Assignments	10
Final Hour Exam	50%
Total	100

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Topics	*Week*
Introduction Theories of Statistics, observations, variables, data presentation, one variable, two variables, three variables, regionalized variables.	1

Data Exploration Introduction, population and sampling theory, concepts and types of variables, measures of central tendency, measures of dispersion, measures of shape, outliers, probability distributions, test of normality.	2
Data Analyses Introduction, regression model analyses, curve fitting, criteria for choosing the "best fit", nonlinear estimation, advance data mining technqiues, practical examples.	3-4
Correlogram and Semi-variogram Autocorrelation analysis, idealized correlograms, correlation length, correlation shape, Moran I test, Fundamental principle of semi-variance, semi-variogram analysis and its components, semi-variograms models, practical applications.	5-6
The Volume-Variance Relationship Regularization, semivariograms for core samples, volume variance calculations, grade/tonnage curves, applications.	7-8
Estimation, interpolation and extrapolation Introduction to the weighting factors, corner point technique, inverse distance technique, variogram weighting factor technique, punctual kriging, block kriging, universal kriging, indicator kriging, practical examples.	9-10
Temporal Analysis Definition of time scale variability, choosing the best fit, ARIMA, Seasonal ARIMA, practical applications.	10-11

Climate Change and Modeling Overview of Climate Change Variability, Climate change Impacts, climate change modelling Techniques, Climate Models and their Evaluation, Global and Regional Climate Projections, Applications in Climate Change Modelling, Adaptation and Mitigation of Climate Change, Capacity Development for Innovation, practical applications using local and international case studies.	16

Course Syllabus

Course Number: 111202411
Environmental Spatial and Temporal Variability

The Hashemite University, Faculty of Natural Resources and Environment,
Department of Land Management and Environment,
Spring Semester, 2014-2015

Instructor Information

Instructor:	Dr. Mohammed Ibrahim Al-Qinna
Office Location:	Geological Building, 110
Telephone:	Office +962 5 3903333 Ext. 5122
Office Hours:	Tuesday 14.30- 17.00, Wednsday 14.00 – 16.00
E-mail:	Qinna@hu.edu.jo
Website:	http://staff.hu.edu.jo/qinna

Course Identification

Course Number:	111202411
Course Name:	Environmental Spatial and Temporal Variability
Course Location:	University Campus
Class Times:	Sunday and Tuesday 12:00pm – 13:00pm
Prerequisites:	Environmental Science (111203231) and GIS (111203243)
Faculty Web Page:	http://www.hu.edu.jo

Course Description/Overview

The course aims to introduce students to the concept of regionalized variables and the available international modelling approaches used to quantify these variabilities. In addition, the course aims in educating the students with the concept of interpolation using kriging techniques and future prediction using advance mathematical modelling techniques as ARIMA.

The course also aims to educate and train students on the cabailities of the spatial and temporal models to be implemented as an environmental impact assessment technqiue to any risk that may threat either natural or human entities. With emphasis on policy oriented research, the course aims in providing various skills to ensure proper land, water, and environmental management planning and sustainable development through practical applications for various measures obtained from governmental and research institutional units.

In order to increase the awareness of the students of the climate change threats to the fragile environmental systems of the country (including land, water, and biodiversity), the course concentrate on climate change and overviews the climatic variability in all its associated components providing evidencing of climate variability. also, the section overviews the capability of the spatial and temporal modelling to access climate change impacts (e.g. drought, floods, etc), to estimate the vulnerability of the targeted systems, and to provide adaptation and mitigation options and measures that facilitate further sustainable development of the country towards

equitable climate-compatibility.

Final section focuses on importance of modeling in mainstreaming policies and strategies at both national and international levels with issues related to climate change and sustainable human development. Finally, the course provides analysis and interpretation of large-scale variability and observed climate change, identifying trend analyses and description of atmosphere Behavior with overviews of numerical modeling and numerical weather prediction as GCM, RCM, stochastic models, and downscaling. Using participatory techniques, such as focus group discussions and individual interviews students are involved in gathering and identifying further challenges, limitations, obstacles and barriers to achieve the sustainability of the country various natural systems.

Course Learning Objectives

The overarching goals of this course are: a) to provide several approaches to model, estimate, and predict future spatial and temporal variability using simple and advanced statistical and data mining techniques; b) raise awareness of the students on climate change vulnerability and the capability of spatial and temporal models for future planning, sustainable management, and strategic development; and c) use available statistical tools to conduct environmental impact assessments for any system, and to identify and quantify threats, risks and constrains allocated within the environmental entity.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

65. Distinguish between statistical methodologies and approaches to analyse the regionalized variable spatially and temporally based on the data types.
66. Use the available softwares to derive and conduct environmental impact assessment for any system, and to quantify threats, risks and constrains allocated within the environmental

entity.

67. Improve intellectual and practical skills through practical applications of actual national and international case studies.
68. Improve the awareness of the modelling and its vital role in estimating the impacts and vulnerability assessments of the system for climate change threats.
69. Improve and broaden students knowledge towards the importance of spatial tools to mainstream climate change policy and strategy

Course Resources

Course Website(s)

11. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.) (2007). Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
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19. http://unfccc.int/2860.php
20. http://www.ipcc.ch/
21. http://www.epa.gov/climatechange/links.html
22. http://cdiac.ornl.gov/pns/gcclinks.html
23. http://www.climateark.org/links/
24. http://www.linktv.org/climatechange
25. http://www.unep.org/
26. http://www.wmo.int/
27. http://www.un.org/
28. http://www.un.org/wcm/content/site/climatechange/gateway
29. http://www.ipcc-data.org/
30. http://www.cbd.int/
31. http://www.unccd.int/en/Pages/default.aspx
32. http://www.giss.nasa.gov/projects/gcm/
33. http://lcluc.umd.edu/
34. http://daac.ornl.gov/daacpages/mercury.html
35. www.aip.org/history/**climate**/GCM.htm
36. www.real**climate**.org/index.php/.../general-**circulation-model**-gcm/

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Climate change Overview of Climate Change Variability, Climate change Impacts, climate change modelling Techniques, Climate Models and their Evaluation, Global and Regional Climate Projections, Applications in Climate Change Modelling, Adaptation and Mitigation of Climate Change, Capacity Development for	16

Innovation, practical applications using local and international case studies.	

Course	**Multimedia programming**
Module 1	Course overview
Key Concepts	What is Multimedia, Defining multimedia, Types of multimedia, Multimedia requirements, Delivering and Using Multimedia, Where to use multimedia
Overview	This module will provide a general introduction to multimedia. There will be a focus on the opportunities that the multimedia provides. This module will also explain how multimedia will be used to address none technological concepts such as climate change.
Aim	The overriding aim of this module is to turn students able to understand what is multimedia and what its strengths and limitations.
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss the strengths and limitations of multimedia • Discuss how technology can contribute to sustainability
Units	Unit 1.1 Defining multimedia Unit 1.2: Types of multimedia Unit 1.3: Delivering and Using Multimedia Unit 1.4: Where to use multimedia
Readings	
Activity	**Overview** Reflecting Upon the use of multimedia to address climate change in Jordan, and globally.

Module 2	**making multimedia**
Key Concepts	The Stages of a Project, Hardware, Software, Delivery vehicles, Creativity, Organization
Overview	In this module the different stages of a multimedia project is explained and discussed. The needed hardware and software to develop the project is also discussed. Then the importance of creativity and organizational skills are presented
Aim	The aim of this module is to Enhances understandings of the processes and practices of developing a multimedia project
Learning Outcomes	At the end of this module learners will be able to: • Understand the stages of a multimedia project • Understand the processes of making a multimedia project and its requirments
Units	Unit 2.1: Stages of a Project. Unit 2.2: Hardware, Software tools. Unit 2.3: Delivery vehicles Unit 2.4: Organizational and creativity skills
Readings	
Activity	Discuss the stages of a multimedia project about climate change
Module 3	**Multimedia Skills**

Key Concepts	Members of a Multimedia Team
Overview	Who are Multimedia Developers? Members of a Multimedia Team, Project manager, Multimedia designer, Interface designer, Writer, Video specialist, Audio specialist, Multimedia programmer, Producer of multimedia for the Web, Team building
Aim	This module aims at identifying the various skills that the multimedia project team should hold.
Learning Outcomes	At the end of this module learners will be able to: • Be able to identify different skills needed for a project
Units	Unit 3.1: Members of a Multimedia Team *Unit 3.2:* Project manager Unit 3.3: *Designers* Unit 3.4: Video specialist, Audio specialist Unit 3.5: Producer of multimedia for the Web
Readings	
Activity	**Overview** *Assignment 0: building a team an choosing a topic* Form a group of 3-4 students. Choose a project and write the plane in accordance of the team skills to achieve it. [End of the week] This term project will be about climate change This assignment will be described in a paper (maximum 2 pages) comprised of the climate change topic description.

Module 4	Text
Key Concepts	Using Text in Multimedia
Overview	Using Text, Using Text in Multimedia, Designing with text, Choosing text fonts, Menus for navigation, Buttons for interaction, HTML documents, Symbols and icons, Animating text, Mapping text across platforms, Font Editing and Design Tools
Aim	The overriding aim of this module is to explore the use of text in a multimedia project
Learning Outcomes	At the end of this module learners will be able to: • Demonstrate knowledge on the concept of Mapping text across platforms • Be able to develop using Font Editing and Design Tools
Units	Unit 3.1: Using Text in Multimedia Unit 3.2: Designing with text Unit 3.3: Mapping text across platforms Unit 3.4: Font Editing and Design Tools
Readings	
Activity	**Overview**
	Assignment 1: choose an effect or a topic in climate change and divide it into several scenes, plane the story board. Decide what media type you will use to deliver each scene. [End of the week] Assignment : Using the WWW search for participatory video clips addressing climate change with particular to your own theme chosen.

Module 5	**sound**
Key Concepts	Digital sound, MIDI sound
Overview	The Power of Sound, Multimedia system sounds, MIDI Versus Digital Audio, Understanding computer audio, Digital audio, Preparing digital audio files, File size versus quality, Editing digital recordings, Making MIDI audio, Audio File Formats, Toward professional sound: The Red Book standard, Copyright issues
Aim	The aim of this module is to equip students with the capacity to record and edit sound.
Learning Outcomes	At the end of this module learners will be able to: • Digitize soun • work with MIDI • incorporate sound to a project
Units	Unit 5.1: MIDI Versus Digital Audio Unit 5.2: Preparing digital audio files Unit 5.3: Preparing MIDI files Unit 5.4: professional sound
Readings	
Activity	**Overview**
	Start the production process

	Assignment 2: record and choose a suitable file format for the various scenes using the tool "Sound Forge" [Mid of week 6]
Module 6	**Images**
Key Concepts	Color, bit maps, vector images
Overview	Understanding natural light and color , Computerized color and color models, Color palettes , Making Still Images, Bitmaps, Bitmap software, Capturing and editing images, Vector drawing, Vector-drawn objects versus bitmaps, 3-D drawing and rendering, Panoramas, Image File Formats **Assignment 3:** design the needed images for climate change topic using the tool Photoshop [Mid of week 7]
Aim	The overriding aim of this module is to learn the processes for editing and working with images
Learning Outcomes	At the end of this module learners will be able to: • work with digital images • work with vector images
Units	Unit 6.1: Understanding natural light and color Unit 6.2: Making Still Images Unit 6.3: Vector-drawn objects versus bitmaps
Readings	A compilation of hands-out
Activity	**Overview**
	Assignment 3: design the needed images for climate change topic using the tool Photoshop [Mid of week 7]

Module 7	Animation
Key Concepts	Cell, computer animation
Overview	The Power of Motion, Principles of Animation, Animation techniques, Cel animation, Computer animation, Kinematics, Morphing, Animation file formats
Aim	The aim of this module is to help students understand and work with animation
Learning Outcomes	At the end of this module learners will be able to: • be able to work with animation • animate simple scenes
Units	Unit 7.1: Power of Motion Unit 7.2: Animation techniques Unit 7.3: Computer animation
Readings	
Activity	**Overview**
	Assignment 4: using Flash animate the scenes designed earlier [end of week 10]

Module 8	Video
Key Concepts	Analog, digital video
Overview	Using Video, Analog versus digital, How Video Works, Broadcast video standards, High Definition Television (HDTV), Integrating Computers and Television, Video color, Working with text and titles, Shooting and Editing

	Video, Recording formats, Digitizing video, Video compression
Aim	The aim of this module is to help students integrate the video into the project and be able to edit and shoot video
Learning Outcomes	At the end of this module learners will be able to: • be able to work with different video file formats • shoot and edit video
Units	Unit 8.1: Analog versus digital Unit 8.2: Video color Unit 8.3: Shooting and Editing Video Unit 8.4: Digitizing video, Video compression
Readings	Windows Movie Maker free online video tutorials from Atomic Learning are available at http://www.atomiclearning.com/moviemaker2. These tutorials are very helpful in learning the various features of Movie Maker. (You will need the QuickTime video player to view the Atomic Learning tutorials. If needed, click on QuickTime to download the latest version.) Ourmedia.org Publish & store your creations- video, audio, text or graphics. Google Video: Upload or download, digital videos of any size or length.
Activity	**Overview** **Assignment 5:** Imagine that you are a multimedia instructor; explain one of the presented topics in this course/ or one of the used tools to your students

	using the Camtasia program to track all your actions and events. [not a group assignment] [end of week 12] **Project:** using the material developed in the assignments (1-4) build a complete seamless project for climate change topic that has been chosen in assignment 0. [end of week 14]

Computer Science and applications Department

Course Syllabus

1001311: Multimedia programming

Hashemite University, Prince Al Hussein Bin Abdullah II for Information Technology, Computer Science

Instructor Information

Instructor: Ibrahim Al-oqily, Dr.
Office Location: IT 238
Telephone: +962 797112343
Office Hours: Sun, Tue, Thur (11:00AM - 1:00 PM)
E-mail: IZALOQILY@HU.EDU.JO
Website: http://staff.hu.edu.jo/ialoqily

Course Identification

Course Number: 1001311

Course Name: Multimedia Programming
Course Location: http://www.hlms.hu.edu.jo
Class Times: Sun, Tue, Thur 9-10:00Am – 12-1:00pm
Prerequisites:
Faculty Web Page: http://www.hu.edu.jo/fac/Default.aspx?facid=67000000

Course Description/Overview

This course teaches the concepts and skills of using text, images, sound, animation, and video to create multimedia projects and applications. Students will learn the basic principles of each media type including digital representation and issues that arise when media are combined. Students will deal with ethical and legal issues, design considerations including usability, hardware and software that enable multimedia, data representation and file types, data storage, data transmission, digitizing and compression techniques. The course provides case studies, particularly related to climate change issues, showing how students, families and citizens can be "empowered" to make their voices heard in the process for building a more sustainable society. The course contains assignments to practice the use of different concepts. The assignments concentrates on developing video-clips dealing with climate change and local/global issues related to sustainable human development. Using participatory techniques, such as focus group discussions, individual interviews and writing scenarios students are involved in gathering evidence from the environment and community members involved in making the participatory videos. Students will be engaged in a self-reflective process assessing the strengths and limitations of participatory video as a catalyst for transforming themselves and society.

Course Learning Objectives

The course is intended to meet the following learning objectives:

5. To equip students with an understanding of the processes and methodologies required for effective design of multimedia artifacts and systems;

6. To provide a framework for classification, capture and effective deployment of the range of multimedia resources by using participatory video and animation as tools to help the community, identify risks and develop climate change adaptation strategies

7. To support the development of skilled and imaginative use of a selection of software tools appropriate to the design, management and deployment of multimedia resources and systems.

8. To learn how to use multimedia projects to raise awareness of the role of some technologies in enabling learners to reflect critically on the rights, roles and responsibilities of an active citizen in preparing for a sustainable future for all

Course Content Learning Outcomes

LO1 : **Knowledge and Understanding** (Objective 1) [taught in lectures]

Having successfully completed this course, you will be able to demonstrate knowledge and understanding of:

- the current key issues in multimedia development
- Specific and detailed knowledge and understanding in a number of chosen topics in the area of multimedia.

LO2 : **Intellectual Skills** (Objective 2) [taught in lectures and re-enforced through the coursework]

Having successfully completed this course, you will be able to:

- analyze, review and critically evaluate the work of peers
- analyze, review and critically evaluate your own work
- explain the inter-relationship of areas of computer science research and the ways in which the convergence of technologies drives the development of Multimedia Systems

LO3 : **Practical Skills** (Objective 3) [taught in lectures and re-enforced through the coursework]

Having successfully completed this course, you will be able to:

- develop and integrate a broad range of skills necessary to develop and understand a multimedia projects

LO4 : **General Transferable Skills** (Objective 4) [taught in lectures and re-enforced through the coursework]

Having successfully completed this course, you will be able to:

- communicate technical information in a written format, and to an agreed academic convention
- communicate technical information in a verbal format
- work collaboratively with others to achieve greater understanding of a technical issue and sustainable environment
- study independently and make personal choice in study

Course Resources

Course Website(s)

- http://www.hlms.hu.edu.jo (Login using your student number and password)
- http://www.widearea.co.uk/designer/compress.html
- http://www.digitalhymnal.org/glossary_m-z.html
- http://www.sigmm.org/Education/

Required Course Texts and Materials

- Vaughan, T. "Multimedia - Making it Work" 8 edition (October 29, 2010), McGraw-Hill, 2008. **ISBN-10:** 0071748466

Optional Course Texts and Materials

- Steinmetz and Nahrstedt, “Multimedia Computing, Communications and Applications,” Pearson Education, Sep 1, 1995
- Anne Cranny-Francis,” MultiMedia: texts and contexts,” Sage Publications Ltd (October 3, 2005) ISBN-10: 076194995X
- Richard E. Mayer, "Multimedia Learning," Cambridge University Press; 2 edition (January 19, 2009), ISBN-10: 0521514126
- Ashraf M. A. Ahmad and Ismail Khalil Ibrahim, "Multimedia Transcoding in Mobile and Wireless Networks," (Jul 25, 2008)

Assignments and Grading Scheme

Project: This term project will be about designing and developing a video or an animation about climate change in Jordan. Using the material developed in the assignments (1-4) you will build a complete seamless project for your story that will be decided in assignment 0. Knowledge and Understanding developed during this course will be used to achieve the project.

Assignment 0: Form a group of 3-4 students. Choose a project and write the plane in accordance of the team skills to achieve it. General Transferable Skills listed in LO4 will be taught and practiced during this assignment.

Assignment 1: choose an effect or a topic in climate change and divide it into several scenes. Decide what media type you will use to deliver each scene. General Transferable Skills listed in LO4 will be taught and practiced during this assignment.

Assignment 2: record and choose a suitable file format for the various scenes using the tool "Sound Forge" Practical Skills listed in LO3 will be demonstrated using this assignment

Assignment 3: design the needed images for climate change topic using the tool Photoshop Practical Skills listed in LO3 will be demonstrated using this assignment

Assignment 4: using Flash animate (or make a short video) the scenes designed earlier Practical Skills listed in LO3 will be demonstrated using this assignment

Assignment 5: Imagine that you are a multimedia instructor; explain one of the presented topics in this course/ or one of the used tools/ or any topic of your choice to your students using the Camtasia program to track all your actions and events. Intellectual Skills listed in LO2 in addition to Practical Skills listed in LO3 will be acquired from this assignment.

Grading System

Letter grades will be awarded based on the following scale.

80-100%: A range (A+,A, A-)

70-80%: B range (B+, B, B-)

60-70%: C range (C+, C, C-)

50-60%: D range (D+, D)

Below 50%: F

These thresholds are not binding. We may lower the thresholds described here depending on the performance of the class. We will not raise the thresholds. We will give an approximate grade breakdown in the middle of the semester, but **you are responsible for keeping track of**

your own grades. If you would like to appeal your grade on any of the assignments or exams, you may do so within **one week** of the assignment or exam being handed back. Your **entire** assignment or exam will be regarded and your grade may go up or down, or it may stay the same

Grading Policy

Assignments	10%
Project	15%
Class attendance/participation	5%
Midterm Exams	20%
Final Exam	50%
Total Points	**100**

Course Policies

Late Assignments

Assignments are due on the posted dates. There is a 20% deduction for late assignment. The deduction becomes 50% if the assignment is two days late. No credit is given after three days. Any exceptions must be arranged at least a day before the assignment is due.

Classroom Protocol

8. Students are expected to read the appropriate sections of the book before each lecture.
9. Please be considerate of your classmates during class.
10. Students are expected to show courtesy and respect toward their classmates.
11. Please come to class on time. If you are late more than 10 minutes then you are not allowed to enter the class.
12. Please make sure that your cellular phone does not interrupt during lecture time, and especially during test time.
13. Please do not carry on side discussions with other students during lecture time.
14. When you have a question, please raise your hand and ask the question so that everyone may benefit from it.

Dissability

Students with special needs should discuss their needs with instructor before the first class to allow for proper arrangements.

Important Dates to Remember

Midterm Exams [during week 9]
Final Exam [during week 16]
Project deadline [end of week 14]

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines
1		What is Multimedia, Defining multimedia, Types of multimedia, Multimedia requirements, Delivering and Using Multimedia, Where to use multimedia? Virtual reality (VR)
2		**Introduction to making multimedia** The Stages of a Project, Hardware, Software, Delivery vehicles, Creativity, Organization
3		**Multimedia Skills** Who are Multimedia Developers? Members of a Multimedia Team, Project manager, Multimedia designer, Interface designer, Writer, Video specialist, Audio specialist, Multimedia programmer, Producer of multimedia for the Web, Team building **Assignment 0:** Form a group of 3-4 students. Choose a project and write the plane in accordance of the team skills to achieve it. [End of the week] This term project will be about climate change
4		**Text**

		Using Text, Using Text in Multimedia, Designing with text, Choosing text fonts, Menus for navigation, Buttons for interaction, HTML documents, Symbols and icons, Animating text, Mapping text across platforms, Font Editing and Design Tools **Assignment 1**: choose an effect or a topic in climate change and divide it into several scenes. Decide what media type you will use to deliver each scene. [End of the week]
5 +6		**Sound** The Power of Sound, Multimedia system sounds, MIDI Versus Digital Audio, Understanding computer audio, Digital audio, Preparing digital audio files, File size versus quality, Editing digital recordings, Making MIDI audio, Audio File Formats, Toward professional sound: The Red Book standard, Copyright issues **Assignment 2:** record and choose a suitable file format for the various scenes using the tool "Sound Forge" [Mid of week 6]
7+8		**Images** Understanding natural light and color , Computerized color and color models, Color palettes , Making Still Images, Bitmaps, Bitmap software, Capturing and editing images, Vector drawing, Vector-drawn objects versus bitmaps, 3-D drawing and rendering, Panoramas, Image File Formats **Assignment 3:** design the needed images for climate change topic using the tool Photoshop [Mid of week 7]
		MidTerm Exam
9+10		**Animation** The Power of Motion, Principles of Animation, Animation techniques, Cel animation, Computer animation, Kinematics, Morphing, Animation

		file formats **Assignment 4:** using Flash animate the scenes designed earlier [end of week 10]
		Project: using the material developed in the assignments (1-4) build a complete seamless project for climate change topic that has been chosen in assignment 0. [end of week 14]
11+12		**Video** Using Video, Analog versus digital, How Video Works, Broadcast video standards, High Definition Television (HDTV), Integrating Computers and Television, Video color, Working with text and titles, Shooting and Editing Video, Recording formats, Digitizing video, Video compression **Assignment 5:** Imagine that you are a multimedia instructor; explain one of the presented topics in this course/ or one of the used tools to your students using the Camtasia program to track all your actions and events. [not a group assignment] [end of week 12]
13		**Hardware, Basic Software tools** The Macintosh platform, The Windows platform, Memory and Storage Devices. Web servers, Web browsers, Plug-ins and delivery vehicles, Web Page Makers and Site Builders
14+15		**Compression Technique (Hand Out)** Sound compression techniques, Image Compression techniques, Video compression techniques
		Final Exam

Course Syllabus

Course Number:

Course Name: **Environmental Impact Assessment**

Instructor Information

Instructor	Dr. Salahuddin M. Jaber
Office Location	218 Faculty of Natural Resources and Environment Building Hashemite University Campus
Telephone (Office)	05 390 3333 # 4472
Office Hours	
E-mail	sjaber@hu.edu.jo
Website	

Course Identification

Course Number	
Course Name	Environmental Impact Assessment
Course Location	Hashemite University Campus
Class Times	
Pre-requisites	
Faculty Web Page	http://www.hu.edu.jo/

Course Description/Overview

This course is directed to beginning students of environmental impact assessment (EIA). The main focus is on the fundamental principles and 'good' practices of EIA that are common across EIA systems.

In recognition that EIA is a subject of interest to many disciplines and persons of varied backgrounds, this course is interdisciplinary in perspective and attempts to balance discussion on physical and human environments.

The course is organized in four parts. In each part a number of principles and procedures are introduced, including case study examples and select methods and techniques. Part I introduces the basic principles of EIA, including the aims and objectives of EIA and an overview of the generic EIA process. Part II examines the nature of environmental impacts and common methods and techniques used to support EIA practice. Part III focuses on EIA principles and procedures, from screening, scoping, impact prediction and evaluation to post-decision analysis. Part IV introduces one key area of EIA that is under rapid transition – strategic environmental assessment (SEA) – and demonstrates linkages between it and project-based EIA.

Course Learning Objectives

The major goals of this course are:

1. Provide information and guidance on EIA and SEA good practice as being the most commonly practiced environmental management tools in the world.
2. Explain the concepts, procedures, and tools that are used currently in implementing an integrated approach to impact assessment of development projects, policies, plans, and programs.
3. Provide comprehensive coverage of generic elements of good practice that are internationally accepted and widely applicable.
4. Indicate some of the possible future directions for integrated assessment based on current trends and initiatives.
5. Raise awareness of the importance of the roles that EIA and SEA play in sustainable development and in climate change adaptation policies and in combating global warming.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Explain the terms EIA and SEA and their objectives.
2. Discuss the major drawbacks of EIA and SEA.
3. Participate in conducting an EIA and SEA.
4. Supervise a scoping session for determining the scope of EIA and SEA.
5. Write EIA and SEA draft and final reports.
6. Participate in reviewing the EIA and SEA draft and final reports.
7. Develop a comprehensive:
    a. environmental management plan (EMP)
    b. environmental monitoring plan
    c. environmental contingency and emergency plan
8. Discuss the roles of stakeholders and public in EIA and SEA.
9. Explain the legal (national and international) requirements of EIA and SEA.
10. Demonstrate the importance of EIA and SEA in sustainable development and combating global warming.

Course Resources

Required Course Texts and Materials

Hands-out prepared by the instructor for the class.

Noble B.F. (2009): Introduction to Environmental Impact Assessment: A Guide to Principles and Practices. Canada: Oxford University Press.

Optional Course Texts and Materials

Optional Textbooks:

Glasson J., Therivel R., and Chadwick A. (2012): Introduction to Environmental Impact Assessment. USA: Routledge.

Eccleston C.H. and Doub J.P. (2012): Preparing NEPA Environmental Assessments – A User's Guide to Best Professional Practices. USA: CRC Press.

James D.E. (2011): The Application of Economic Techniques in Environmental Impact Assessment. Netherlands: Springer.

Friedman F.B. (2011): Practical Guide to Environmental Management. USA: Environmental Law Institute.

Optional International Peer-Reviewed and Refereed Journals:

Environmental Impact Assessment Review – Elsevier: http://www.journals.elsevier.com/environmental-impact-assessment-review/

Journal of Environmental Management – Elsevier: http://www.journals.elsevier.com/journal-of-environmental-management/

Environmental Management – Springer: http://www.springer.com/environment/environmental+management/journal/267

Optional International Organizations Websites:

United Nations Development Program: http://www.undp.org/content/undp/en/home.html

United Nations Environment Program: http://www.unep.org/

The World Bank: http://www.worldbank.org/

International Finance Corporation: http://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/home

Organization for Economic Cooperation and Development: http://www.oecd.org/

The Environmental Law Institute: http://www.eli.org/

United States Environmental Protection Agency: http://www.epa.gov/

Grading Policy

First Exam	20%
Second Exam	20%
Assignments	10%
Attendance and Participation	10%
Final Exam	40%

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than 15% of the classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 10% of the grade.

Disability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Course Schedule

Week	Topic
1	• Discussion of syllabus and assignments, course requirements and pre-requisites. • The generic EIA process
2	• Aims and objectives of EIA
3 and 4	• Nature and classification of environmental impacts
5 and 6	• Methods supporting EIA practice
7	• National and international legal requirements of EIA
8	• Screening procedures
9	• Scoping procedures
10	• Predicting environmental impacts
11	• Determining impacts significance
12	• Managing project impacts
13	• Post-decision monitoring
14	• SEA principles
15 and 16	• Projects discussions and presentations

Course Modules

Course	Environmental Impact Assessment
Module 1	EIA Principles
Key Concepts	The generic EIA process
Overview	This module introduces the basic principles of EIA, including aims and objectives of EIA and an overview of the generic process EIA process.
Aim	The main aims of this module are to introduce the students to the basic terminology in EIA and its objectives and drawbacks and how the EIA is carried out as a generic process.
Learning Outcomes	At the end of this module the students will be able to discuss: 1. what is meant by EIA 2. the origins and development of EIA 3. the international status of EIA 4. the EIA process 5. the benefits and challenges of EIA
Readings	Chapter 1: Noble B.F. (2009): Introduction to Environmental Impact Assessment: A Guide to Principles and Practices. Canada: Oxford University Press.
Module 2	Foundations of EIA
Key Concepts	Environmental impacts methods used in EIA practice
Overview	This module examines the nature of environmental impacts and common methods and techniques used to support EIA practice.
Aim	The main aims of this module are to introduce students to the

	types of environmental impacts and the methods used to identify, predict, and manage environmental impacts, in addition to the types of publics and how they can be exposed to the EIA
Learning Outcomes	At the end of this module the students will be able to discuss: 1. the differences between environmental effects and impacts 2. different types of environmental impacts 3. different methods used for impact identification and classification, including checklists, matrices, networks, models, GIS, and expert judgment 4. rational for public involvement 5. levels of public involvement 6. elements for successful public involvement
Readings	Chapters 3 and 4: Noble B.F. (2009): Introduction to Environmental Impact Assessment: A Guide to Principles and Practices. Canada: Oxford University Press.
Module 3	EIA Practice
Key Concepts	Screening Scoping impact prediction, evaluation, management, and monitoring
Overview	This module focuses on EIA principles and procedures, from screening, scoping, impact prediction and evaluation to post-decision analysis.
Aim	The main aims of this module are to introduce students to the different stages of carrying out EIA from screening to post-decision monitoring
Learning Outcomes	At the end of this module the students will be able to discuss: 1. screening procedures 2. scoping types and functions

	3. scoping requisites 4. impact prediction 5. basic requirements of impact prediction 6. predicting impacts on the biophysical environment 7. predicting impacts on the human environment 8. challenges to impact prediction 9. determining impact significance 10. managing negative and positive impacts 11. rational for post-decision monitoring 12. requirements for effective monitoring 13. monitoring methods and techniques
Readings	Chapters 5, 6, 7, 8, 9, and 10: Noble B.F. (2009): Introduction to Environmental Impact Assessment: A Guide to Principles and Practices. Canada: Oxford University Press.
Module 4	Advancing Principles and Practices
Key Concepts	SEA principles
Overview	This module introduces SEA and demonstrates the linkage between it and project-based EIA.
Aim	The main aims of this module are to introduce students to the basic concepts of SEA and the future of EIA and SEA
Learning Outcomes	At the end of this module the students will be able to discuss: 1. the basics of SEA 2. aims and objectives of SEA 3. types of SEA 4. SEA framework 5. Future directions of EIA and SEA
Readings	Chapter 12: Noble B.F. (2009): Introduction to Environmental Impact Assessment: A Guide to Principles and Practices. Canada: Oxford University Press.

Course Syllabus
Economic Feasibility Studies
Department of Economics
Faculty of Economics and Administrative Sciences
The Hashemite University
First Semester, 2014-2015

Course Identification

Course Title	**Economic Feasibility Studies**
Course Number	**110201412**
Prerequisites	**Principles of Microeconomics (110205103) & Principles of Finance (110205105)**
Providing Department	**Economics Department**
Sections Number	**1**
Accredited Hours	**3 credit hours**
Lectures Location	**ECON 112**
Class Times	**12:00-1:00**

Instructor Information

Instructor	**Dr. Ahmad Alwaked**
Office Location	**Econ. 304**
E-mail	**aalwaked@hu.edu.jo**
office Hours	**By appointment**
Telephone	**(05) 3903333 Ext: 4189**
Faculty Web Page	**http://staff.hu.edu.jo/aalwaked**

Course Description:

This course aims to provide students with an overview of the economic decision making process. It helps students test the feasibility of economic projects and introduces methods of preference between different projects. It also aims to improve students' report writing and to help student collect and analyze data efficiently.

Course Objectives: Learning Outcomes:

The main objectives of this course are to help students to understand what economic feasibility studies is all about by providing students with the basic knowledge concerning the main topics in feasibility studies and project appraisal, especially with regard to cost and revenue structure of the firm, financial analysis, managerial analysis, accounting analysis and investors decision making process. This general objective will be achieved through the following learning outcomes:

A- Knowledge and Understanding: the students should be able to:

1- Understand the investors' decision making.
2- Identify the difference between feasibility study and project appraisal.
3- Understand the different levels of economic feasibility studies.
4- Learn the cost and revenue structures of the projects.
5- Learn the relationship between economics, financial, business and accounting analysis.

B- Intellectual Skills: students should be able to:

1- Employ Economic terms and concepts in making rational decisions.
2- Identify the costs and revenue terms and items.
3- Learn how to calculate and determine the economic profit and loss in economic institutions.
4- Compare between different projects in terms of profitability.
5- Identify the all aspects of the firm: legal, environmental, market, technical, financial and social.
6- Learn how to present his work and defends it.

C- Practical skills:

1- Using theory tools to analyze the behavior of firms and individuals.
2- Using the graph, tables, and equations in the analysis of economic variables.

3- Using statistical and financial analysis.
4- Using computer in conducting a preliminary study.

Teaching Methods:

Duration	: 14 weeks, 42 hours
Lectures	: 33lectures plus 60 minutes midterm exam

Course Work Requirements:

Activity	Type	Due date
Homework	. - Prepare market survey for a project; .	2/10/2014
	. - Prepare a preliminary feasibility studies for a project; . - Submit a feasibility study	28/12/2014

Tests and Evaluation:

1. Final exam 40 Points
2. Class Participation & presentation 20 Points
3. Midterm exam (2/12/2014) 20 Points
4. Project 20 Points

Course Contents:

Part one: Investment and Economic Feasibility Studies: Chapter 1: Concepts of Feasibility Studies Chapter 2: Stages of Feasibility Studies and interrelations	6 Lecture
Part two: Aspects of a Feasibility Study Chapter 3: Environmental aspects of the Feasibility Study Chapter 4: Legal aspects of the Feasibility Study Chapter 5: The Marketing aspect of a Feasibility study of a project Chapter 6: The Technical aspect of a Feasibility study of a project Chapter 7: The Financial aspect of a Feasibility study of a project Chapter 8: The Social aspect of a Feasibility study of a project	18 Lectures
Part three: Risk, Evaluation, Forecasting and fixing Chapter 9: Risk and Uncertainty involved in a project Chapter 10: Project Evaluation in existing firm(project) Chapter 11: Performance Forecasting for existing firms (project) Chapter 12: Losing Project Fixing	8 Lectures
Part Four: 1) Case study: Chapter 13 **2) "Production of Interlock Concrete" Case** **3) Using Computer in Feasibility Studies and project evaluation**	4 Lectures
Part Five: Research writing skills	1 Lectures

Part Six: Designing and Writing a Feasibility Study " Presentation"	2 Lectures

Text Book and supporting Material:
Text Book:

- Economic Feasibility Studies and Evaluate Investment Projects, Shokairi Mousa & Osama Salaam, 3rd edition, Massira Publishing, Amman, Jordan 2013.

Supporting Material:

- Feasibility Studies and Project Evaluation, Kadem Nadem Alesawi, Amman, Jordan, 2005.

Note: All students will be provided by a detailed summary, three case studies, and a well-organized feasibility tables.

Good Luck

Course Syllabus

Course Number:
Course Name: **Environmental Impact Assessment**
Instructor Information

Instructor	Dr. Salahuddin M. Jaber
Office Location	218 Faculty of Natural Resources and Environment Building Hashemite University Campus
Telephone (Office)	05 390 3333 # 4472
Office Hours	
E-mail	sjaber@hu.edu.jo
Website	

Course Identification

Course Number	
Course Name	Environmental Impact Assessment

Course Location Hashemite University Campus
Class Times
Pre-requisites
Faculty Web Page http://www.hu.edu.jo/

Course Description/Overview

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Course Learning Objectives

The major goals of this course are:

6. Provide information and guidance on EIA and SEA good practice as being the most commonly practiced environmental management tools in the world.
7. Explain the concepts, procedures, and tools that are used currently in implementing an integrated approach to impact assessment of development projects, policies, plans, and programs.
8. Provide comprehensive coverage of generic elements of good practice that are internationally accepted and widely applicable.
9. Indicate some of the possible future directions for integrated assessment based on current trends and initiatives.
10. Raise awareness of the importance of the roles that EIA and SEA play in sustainable development and in climate change adaptation policies and in combating global warming.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

11. Explain the terms EIA and SEA and their objectives.

12. Discuss the major drawbacks of EIA and SEA.
13. Participate in conducting an EIA and SEA.
14. Supervise a scoping session for determining the scope of EIA and SEA.
15. Write EIA and SEA draft and final reports.
16. Participate in reviewing the EIA and SEA draft and final reports.
17. Develop a comprehensive:
    a. environmental management plan (EMP)
    b. environmental monitoring plan
    c. environmental contingency and emergency plan
18. Discuss the roles of stakeholders and public in EIA and SEA.
19. Explain the legal (national and international) requirements of EIA and SEA.
20. Demonstrate the importance of EIA and SEA in sustainable development and combating global warming.

Course Resources

Required Course Texts and Materials

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Journal of Environmental Management – Elsevier: http://www.journals.elsevier.com/journal-of-environmental-management/

Environmental Management – Springer: http://www.springer.com/environment/environmental+management/journal/267

Optional International Organizations Websites:

United Nations Development Program: http://www.undp.org/content/undp/en/home.html
United Nations Environment Program: http://www.unep.org/
The World Bank: http://www.worldbank.org/
International Finance Corporation: http://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/home
Organization for Economic Cooperation and Development: http://www.oecd.org/
The Environmental Law Institute: http://www.eli.org/
United States Environmental Protection Agency: http://www.epa.gov/

Grading Policy

First Exam	20%
Second Exam	20%
Assignments	10%
Attendance and Participation	10%
Final Exam	40%

Course Policies

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Course Schedule

Week	Topic

1	• Discussion of syllabus and assignments, course requirements and pre-requisites. • The generic EIA process
2	• Aims and objectives of EIA
3 and 4	• Nature and classification of environmental impacts
5 and 6	• Methods supporting EIA practice
7	• National and international legal requirements of EIA
8	• Screening procedures
9	• Scoping procedures
10	• Predicting environmental impacts
11	• Determining impacts significance
12	• Managing project impacts
13	• Post-decision monitoring
14	• SEA principles
15 and 16	• Projects discussions and presentations

Course Modules

Course	Environmental Impact Assessment
Module 1	EIA Principles
Key Concepts	The generic EIA process
Overview	This module introduces the basic principles of EIA, including aims and objectives of EIA and an overview of the generic process EIA process.
Aim	The main aims of this module are to introduce the students to the basic terminology in EIA and its objectives and drawbacks and

	how the EIA is carried out as a generic process.
Learning Outcomes	At the end of this module the students will be able to discuss: 6. what is meant by EIA 7. the origins and development of EIA 8. the international status of EIA 9. the EIA process 10. the benefits and challenges of EIA
Readings	Chapter 1: Noble B.F. (2009): Introduction to Environmental Impact Assessment: A Guide to Principles and Practices. Canada: Oxford University Press.
Module 2	Foundations of EIA
Key Concepts	Environmental impacts methods used in EIA practice
Overview	This module examines the nature of environmental impacts and common methods and techniques used to support EIA practice.
Aim	The main aims of this module are to introduce students to the types of environmental impacts and the methods used to identify, predict, and manage environmental impacts, in addition to the types of publics and how they can be exposed to the EIA
Learning Outcomes	At the end of this module the students will be able to discuss: 7. the differences between environmental effects and impacts 8. different types of environmental impacts 9. different methods used for impact identification and classification, including checklists, matrices, networks, models, GIS, and expert judgment 10. rational for public involvement 11. levels of public involvement 12. elements for successful public involvement

Readings	Chapters 3 and 4: Noble B.F. (2009): Introduction to Environmental Impact Assessment: A Guide to Principles and Practices. Canada: Oxford University Press.
Module 3	EIA Practice
Key Concepts	Screening Scoping impact prediction, evaluation, management, and monitoring
Overview	This module focuses on EIA principles and procedures, from screening, scoping, impact prediction and evaluation to post-decision analysis.
Aim	The main aims of this module are to introduce students to the different stages of carrying out EIA from screening to post-decision monitoring
Learning Outcomes	At the end of this module the students will be able to discuss: 14. screening procedures 15. scoping types and functions 16. scoping requisites 17. impact prediction 18. basic requirements of impact prediction 19. predicting impacts on the biophysical environment 20. predicting impacts on the human environment 21. challenges to impact prediction 22. determining impact significance 23. managing negative and positive impacts 24. rational for post-decision monitoring 25. requirements for effective monitoring 26. monitoring methods and techniques
Readings	Chapters 5, 6, 7, 8, 9, and 10: Noble B.F. (2009): Introduction to Environmental Impact Assessment: A Guide to Principles and

	Practices. Canada: Oxford University Press.
Module 4	Advancing Principles and Practices
Key Concepts	SEA principles
Overview	This module introduces SEA and demonstrates the linkage between it and project-based EIA.
Aim	The main aims of this module are to introduce students to the basic concepts of SEA and the future of EIA and SEA
Learning Outcomes	At the end of this module the students will be able to discuss: 6. the basics of SEA 7. aims and objectives of SEA 8. types of SEA 9. SEA framework 10. Future directions of EIA and SEA
Readings	Chapter 12: Noble B.F. (2009): Introduction to Environmental Impact Assessment: A Guide to Principles and Practices. Canada: Oxford University Press.

Course	**Climate Change and Global Warming**
Module 1	Introduction to Global Climate Change
Key Concepts	Climate elements, climate change
Overview	The earth has become warmer over the last century. It is reported that the average surface temperature of the earth has increased during the twentieth century by about 0.6° ± 0.2°C. This may seem like a small shift, but although regional and short-term temperatures do fluctuate over a wide range, global temperatures are generally quite stable. In fact, the difference between today's

	average global temperature and the average global temperature during the last Ice Age is only about 5 degrees C. Indeed, it's warmer today around the world than at any time during the past 1000 years, and the warmest years of the previous century have occurred within the past decade.
Aim	The aim of this module is to understand and appreciate climatic changes throughout the globe.
Learning Outcomes	At the end of this module learners will be able to: • Memorize the definition of climate • Name the climate elements • Explain meteorological charts that illustrates climatic data • Appreciate the increase in the mean temperature of the Earth as a planet
Units	Introduction to Global Climate Change
Readings	Cpater one in Bloom text The Discovery of Global Warming by Spencer Weart http://www.aip.org/history/climate/20ctrend.htm Global Climate Change Research Explorer http://www.exploratorium.edu/climate/index.html
Activity	• Power-point slides will be presented • Learners will read chapter one in Bloom text and will access http://www.aip.org/history/climate/20ctrend.htm and http://www.exploratorium.edu/climate/index.html
Module 2	History of Earth's Climate
Key Concepts	Paleoclimatology, geological thermometers, isotopes

Overview	Given that the climate is changing, two questions emerge: First, have such changes happened before in the history of the Earth? And second, what is causing this change? In this module we will examine past climates (paleoclimates) and the forces that caused them to change. This information will set the stage for asking if the same forces that caused past changes are causing climate warming today, and for making predictions about what will happen in the future. From abundant geological evidence, we know that only three hundred and fifty years ago the world was in the depths of a prolonged cold spell called the "Little Ice Age," which lingered for nearly 500 years. Twenty thousand years ago, in the middle of the last glacial period, large continental scale ice sheets covered much of North America, Northern Europe, and Northern Asia. Fifty million years ago, global temperatures were so high that there were no large ice sheets at all.
Aim	The overriding aim of this module is to acquire sound understanding of past climates that prevailed on our planet.
Learning Outcomes	At the end of this module learners will be able to: • Understand what paleoclimatology means • Examine different techniques that are used to study past climates
Units	Chapter 2: History of Earth's Climate
Readings	▪ History of Earth's Climate by Bloom ▪ What is Paleoclimatology? by US NOAA ▪ Earth's Climatic History by Pidwirny

Activity	• Power-point slides will be presented • Learners will read chapter two in Bloom text and will access http://www.ncdc.noaa.gov/paleo/primer.html and http://www.physicalgeography.net/fundamentals/7x.html
Module 3	Causes of Climate Change
Key Concepts	Climate forcings, cyclic forcings, noncyclic forcings, green house effect
Overview	Energy flows in from the sun, much of it in the visible wavelengths, and back out again as long-wave infrared (heat) radiation. An increase in the luminosity of the sun, for example, is a positive forcing that tends to make Earth warmer. A very large volcanic eruption, on the other hand, can increase the aerosols (fine particles) in the lower stratosphere (altitudes of 10–15 miles) that reflect sunlight to space and thus reduce the solar energy delivered to Earth's surface. These examples are natural forcings. Human-made forcings result from, for example, the gases and aerosols produced by fossil fuel burning, and alterations of Earth's surface from various changes in land use, such as the conversion of forests into agricultural land. Those gases that absorb infrared radiation, i.e., the "greenhouse" gases, tend to prevent this heat radiation from escaping to space, leading eventually to a warming of Earth's surface. The observations of human-induced forcings underlie the current concerns about climate change.
Aim	This module aims at identifying cyclic and noncyclic climate forcings.
Learning Outcomes	At the end of this module learners will be able to: • List and explain noncyclic climate forcings • List and explain cyclic climate forcings
Units	Chapter 3 - Causes of Climate Change

Readings	Global Warming Facts and Our Future https://www.koshland-science-museum.org/explore-the-science/earth-lab Causes of Climate Change by US EPA http://www.epa.gov/climatechange/science/causes.html Encyclopedia of Earth: GH effect http://www.eoearth.org/view/article/153146
Activity	• Power-point slides will be presented • Learners will read chapter three in Bloom text and will access https://www.koshland-science-museum.org/explore-the-science/earth-lab, http://www.epa.gov/climatechange/science/causes.html, and http://www.eoearth.org/view/article/153146.
Module 4	World of Tomorrow: Computer Simulation Models
Key Concepts	Modelling, ocean-atmosphere interaction, IPCC, emission scenarios
Overview	The climate is an extremely complex system, whose internal dynamics and future evolution can only be understood through extensive investigations and complicated model computations. An understanding of these natural processes and the implications of man's interference is, however, a prerequisite for preserving the diversity of living conditions on earth. The public and policymakers therefore expect science to provide a reliable basis for climate and environmental protection policy. The earth cannot be experimented with. It is too complex to be reproduced in the laboratory. The only remaining possibility is to simulate it in a computer model.

	How will the climate system react in the future to diverse emissions of greenhouse gases, nitrogen oxides, and other trace substances? How will global warming, the increase in sea level and the change in composition of the upper and lower atmosphere affect living conditions for humans? In order to analyse these impacts, researchers must consider both changes resulting from human activity and those resulting from natural climate and environmental fluctuations, which have historically exerted a heavy stress on societies. The assessment of how the climate in the next century will be affected by the combination of both natural and human factors represents one of the major challenges for science.
Aim	The overriding aim of this module is to understand basic principles in modelling of climate changes.
Learning Outcomes	At the end of this module learners will be able to: • Explain ocean and atmospheric interactions that control the climate • Explain how climate models work • Appreciate the role of the IPCC in studying the climate • Explain emission scenarios of green house gasses
Units	Chapter 4 - World of Tomorrow: Computer Simulation Models
Readings	Simple Models of Climate Change by Weart http://www.aip.org/history/climate/simple.htm GCMs by Weart http://www.aip.org/history/climate/GCM.htm IPCC Chapter on GCMs http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter8.pdf

Activity	• Power-point slides will be presented • Learners will read chapter four in Bloom text and will access: http://www.aip.org/history/climate/simple.htm, http://www.aip.org/history/climate/GCM.htm, and http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter8.pdf
Module 5	**Biological Impacts of Higher Carbon Dioxide Concentrations**
Key Concepts	Food, plant growing rate, crops yield
Overview	Rising atmospheric concentrations of carbon dioxide could dramatically influence the performance of crops, but experimental results to date have been highly variable. For example, when C3 plants are grown under carbon dioxide enrichment, productivity increases dramatically at first. But, over time, organic nitrogen in the plants decreases and productivity diminishes in soils where nitrate is an important source of this nutrient. We have discovered a phenomenon that provides a relatively simple explanation for the latter responses: in C3 plants, elevated carbon dioxide concentrations inhibit photorespiration, which in turn inhibits shoot nitrate assimilation. Agriculture would benefit from the careful management of nitrogen fertilizers, particularly those that are ammonium based.
Aim	The overriding aim of this module is to list and explain negative impacts of climate change on plant and animal adaptation and crops yield
Learning Outcomes	At the end of this module learners will be able to: • Explain the relation between climate change and adaptation in plants and animals • Explain the climate change impact on crops yield and food production
Units	Chapter 5 – Biological Impacts of Higher Carbon Dioxide Concentrations

Readings	Learners are expected to read Chapter 5 in Bloom textbook
Activity	• Power-point slides will be presented • Learners will read chapter five in Bloom text and will access: http://ucce.ucdavis.edu/files/repositoryfiles/ca6302p67-65646.pdf
Module 6	**Climate Change and the Biosphere**
Key Concepts	Biodiversity
Overview	There is ample evidence that climate change affects biodiversity. According to the Millennium Ecosystem Assessment, climate change is likely to become one of the most significant drivers of biodiversity loss by the end of the century. Climate change is already forcing biodiversity to adapt either through shifting habitat, changing life cycles, or the development of new physical traits. Conserving natural terrestrial, freshwater and marine ecosystems and restoring degraded ecosystems (including their genetic and species diversity) is essential for the overall goals of both the Convention on Biological Diversity and the United Nations Framework Convention on Climate Change because ecosystems play a key role in the global carbon cycle and in adapting to climate change, while also providing a wide range of ecosystem services that are essential for human well-being and the achievement of the Millennium Development Goals.
Aim	The overriding aim of this module is to appreciate the linkage between climate change and biodiversity
Learning Outcomes	At the end of this module learners will be able to: • Explain the impact of climate on ecosystems

	• Explain how different ecosystems would respond to the climate change • Identify negative impacts of climate change on biodiversity
Units	Chapter 6 - Climate Change and the Biosphere
Readings	Encyclopedia of Earth: Biosphere, Ecosystem Disturbance, Species Shifts http://www.eoearth.org/topics/view/54257/
Activity	• Power-point slides will be presented • Learners will read chapter six in Bloom text and will access: http://www.eoearth.org/topics/view/54257/
Module 7	**Mitigation Strategies**
Key Concepts	Mitigation, alternative energy sources
Overview	Climate Change Mitigation refers to efforts to reduce or prevent emission of greenhouse gases. Mitigation can mean using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behaviour. It can be as complex as a plan for a new city, or as a simple as improvements to a cook stove design. Efforts underway around the world range from high-tech subway systems to bicycling paths and walkways. Protecting natural carbon sinks like forests and oceans, or creating new sinks through silviculture or green agriculture are also elements of mitigation.
Aim	The overriding aim of this module is to introduce students to different mitigation strategies on climate change
Learning Outcomes	At the end of this module learners will be able to: • Identify the relation between climate change and traditional energy sources • Consider several strategies used to mitigate climate change including using of alternative energy sources, promote solid waste management, and promote sustainable development.

Units	Chapter 7 – Mitigation Strategies: Transportation Chapter 8 – Mitigation Strategies: Electric Power Generation Chapter 9 – Mitigation Strategies: Other Sectors
Readings	Chapters 7 to 9 in Bloom, IPCC Mitigation of Climate Change Report: Transportation,IPCC Mitigation of Climate Change Report, Energy Supply, and IPCC Mitigation of Climate Change Report, Chapt. 6-10
Activity	• Power-point slides will be presented • Learners will read chapters seven to nine in Bloom text and will access: http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch5.html http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch4.html http://www.ipcc.ch/publications_and_data/ar4/wg3/en/contents.html
Module 8	**Economics of Global Climate Change**
Key Concepts	Economics of climate change
Overview	Scientists and economists are beginning to grapple with the serious economic and environmental consequences if we fail to respond to the on-going global warming. Negative impacts of climate change, such as damage to property and infrastructure, sea-level rise, floods, droughts, wildfires, and extreme storms, require extensive repair of essential infrastructure such as homes, roads, bridges, railroad tracks, airport runways, power

	lines, dams, levees, and seawalls. Disruptions in daily life related to climate change can mean lost work and school days and harm trade, transportation, agriculture, fisheries, energy production, and tourism. Severe rainfall events and snowstorms can delay planting and harvesting, cause power outages, snarl traffic, delay air travel, and otherwise make it difficult for people to go about their daily business. Climate-related health risks also reduce productivity, such as when extreme heat curtails construction, or when more potent allergies and more air pollution lead to lost work and school days. Mass migration and security threats. Global warming is likely to increase the number of "climate refugees"—people who are forced to leave their homes because of drought, flooding, or other climate-related disasters. Mass movements of people and social disruption may lead to civil unrest, and might even spur military intervention and other unintended consequences. Societies may find ways to prepare for and cope with some climate impacts—provided that we do not let our carbon emissions continue unabated. However, even a partial accounting of these measures suggests that coping is likely to be more costly steps to reduce carbon emissions thereby reducing associated climate impacts. For example, farmers might need to irrigate previously rain-fed areas, cool vulnerable livestock, and manage new or more numerous pests. Local and state governments that taker early steps to ensure that houses are more energy efficient, and build early warning systems for heat waves and disasters and add emergency responders are more likely to cope with extreme events. Governments may also have to build seawalls, contain sewer overflows, and strengthen bridges, subways, and other critical components of the transportation system. Rebuilding after disasters strike is likely to prove even more costly than these preventive measures, studies show. And these costs do not

	include those stemming from lives lost and other irreversible consequences of allowing heat-trapping gases to accumulate unchecked in our atmosphere.
Aim	The overriding aim of this module is to appreciate the massive cost of the climate change.
Learning Outcomes	At the end of this module learners will be able to: • Explain the economic losses associated with global warming including sea level rise, floods, droughts, diseases, refugees, hurricanes, sick leaves. • Discuss required emergency spending to coup up with global warming • Explain the negative impacts of global warming on national and international funding
Units	Chapter 10 – Economics of Global Climate Change
Readings	Chapters 10 in Bloom, The Economics of Climate Change: A Primer by CBO, and Requiem for Kyoto by Nordhaus & Boyer
Activity	• Power-point slides will be presented • Learners will read chapter ten in Bloom text and will access: http://www.cbo.gov/publication/14387 and http://www.econ.yale.edu/~nordhaus/homepage/Kyoto.pdf
Module 9	**Global Climate change and the Law**
Key Concepts	Legislations, policy, international treaties

Overview	Most countries are Parties to the United Nations Framework Convention on Climate Change (UNFCCC). Article 2 of the Convention states its ultimate objective, which is to stabilize the concentration of greenhouse gases in the atmosphere "at a level that would prevent dangerous anthropogenic. The natural, technical, and social sciences can provide information on decisions relating to this objective, e.g., the possible magnitude and rate of future climate changes. However, the IPCC has also concluded that the decision of what constitutes "dangerous" interference requires value judgements, which will vary between different regions of the world. Factors that might affect this decision include the local consequences of climate change impacts, the ability of a particular region to adapt to climate change (adaptive capacity), and the ability of a region to reduce its GHG emissions (mitigative capacity).
Aim	The overriding aim of this module is to introduce students to international treaties that address the climate change.
Learning Outcomes	At the end of this module learners will be able to: • Name and explain local legislations that govern the climatic issues • Name and explain international treaties that are address the global climatic issues
Units	Chapter 11 - Global Climate and the Law
Readings	Chapter eleven in Bloom, and United Nations Framework Convention on Climate Change.
Activity	• Power-point slides will be presented • Learners will read chapter eleven in Bloom text and will access: http://unfccc.int/2860.php
Module 10	**Global Climate Change: The Human Response**

Key Concepts	Mitigation, alternative energy sources
Overview	In order to mitigate the human contribution to global warming, we should reduce carbon dioxide and other greenhouse gas emissions. Controlling emissions is a large, complex, and potentially expensive problem that no single strategy will solve. Strategies include increasing the energy efficiency of our cars, homes, and power; capturing the carbon emitted by power plants and store it underground; producing more energy from renewable fuels; halt deforestation and soil degradation worldwide, while reforesting more areas. Even if we were to stop greenhouse gas emissions today, additional climate change from emissions already in the atmosphere would be inevitable. For this reason, many governments and industries are beginning to adapt policies, disaster response plans, or infrastructure to prepare for anticipated changes. While some adaptations are difficult and expensive, many are relatively inexpensive and offer immediate benefits. For individuals, governments, and businesses, responding to climate change requires understanding and accepting the risks of regional climate change, assessing the immediate and long-term costs and benefits of adaptation strategies, and implementing adaptations that bring the most

	benefits relative to the cost and risk.
Aim	The overriding aim of this module is to highlight feasible strategies in respond to climate change.
Learning Outcomes	At the end of this module learners will be able to: • Highlight main strategies that are believed to minimise the negative consequences of climate change • Identify what individuals, communities, and governments can do in order to slow down the rate of t e climate change.
Units	Chapter 12 – Global Climate Change: The Human Response
Readings	Chapter twelve in Bloom; Global Warming Politics by Shellenberger & Nordhaus; and Welcome to Doomsday by Moyers.

Activity	• Power-point slides will be presented • Learners will read chapter twelve in Bloom text and will access: http://thebreakthrough.org/images/Death_of_Environmentalism.pdf, http://billmoyers.com/2005/02/25/welcome-to-doomsday-march-24-2005/

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number: ??

Climate Change and Global Warming

The Hashemite University, Faculty of Natural Resources and Environment, Department of Water Management and Environment,

Fall Semester, 2014-2015

Instructor Information

Instructor: Dr. Mahmoud Abu-Allaban

Office Location: The Hashemite University Campus
Telephone: Office – +962 -5- 3903333 4567
Office Hours: S M TH 8.00-10.00
E-mail: mlaban@hu.edu.jo
Website:

Course Identification

Course Number: **??**
Course Name: Climate Change and Global Warming
Course Location: University Campus
Class Times: Wednesday 8:30pm – 11:30am
Prerequisites: Basic concepts in math and science
Faculty Web Page:

Course Description/Overview

The purpose of this course is to provide an overview of the climate change and global warming issue, from its theoretical discovery by atmospheric scientists, to its potential effects on the globe, linkages with resource management and sustainable development, and options for response. Climate history of the Earth and background concepts; climate processes; historical and future climate change; global warming; causes of climate change; human effects on climate; health impacts of climate change; ecosystem impacts of climate change. The course considers the rate of climate change, and what we must do to adapt our philosophies, economics, and lifestyle to reduce carbon emissions. The course will also cover the on-going policy debates at the international scale, including responses to the Kyoto Protocol and Copenhagen Accords.

The course will emphasise on modern climate change, anthropogenic forcing and measured and predicted consequences of this forcing. To understand modern climate change and predictions, it is necessary to develop an understanding of natural climate forcing, natural variability and feedbacks in the climate system. Students will be concurrently studying the earth's climate history, and modern climate change; because it is important to put modern climate change into context, both in terms of the timescale and magnitude of the observed and predicted changes. In addition, studying past climate changes gives an insight into how the climate system operates.

Course Learning Objectives

Upon completion of this course students should be able to describe how the Earth's climate system works and summarize general atmosphere circulation patterns, ocean circulation patterns and climate oscillations. Students should be able to illustrate components of the Earth's carbon cycle and quantitatively describe how addition of CO2 to the atmosphere through burning fossil fuels will influence the climate. Importantly, students will gain the scientific basis to analyse and critique policy issues related to global warming.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

70. Define the terms weather and climate and explain the effect they have on daily life;
71. Explain what the 'greenhouse effect' refers to and explain its significance;
72. Examine how changes in the atmosphere affect global climate conditions;
73. Describe the carbon cycle and assess the impact of changes to the cycle; Demonstrate a solid understanding of the climate system;

74. Evaluate the various factors that shape climate;
75. Explain the concept of climate change;
76. Describe the causes of climate change;
77. Examine the effects of climate change;
78. Describe how past climates contribute to our current understanding of climate change;
79. Consider the different viewpoints/perspectives that exist about climate change;
80. Explain the consequences, risks, and uncertainties of climate change;
81. Suggest strategies at a global, national, local and personal level to manage climate change;
82. Examine the effectiveness of climate change management strategies.

Course Resources

Course Website(s)

Required Course Texts and Materials

Global Climate Change: Convergence of Disciplines
by Arnold Jeffrey Bloom. ISBN 0878930272.

Optional Course Texts and Materials

Climate Change: The Science of Global Warming and Our Energy Future
by Edmond Mathez
Publisher: Columbia University Press (1st edition, 2009)

ISBN: 0231146426

Climate Change: Picturing the Science
by Gavin Schmidt, Joshua Wolfe, and Jeffrey D. Sachs
Publisher: W. W. Norton & Company (1st edition, 2009)
ISBN: 0393331253

The Discovery of Global Warming by Spencer Weart http://www.aip.org/history/climate/20ctrend.htm

Global Climate Change Research Explorer
http://www.exploratorium.edu/climate/index.html

What is Paleoclimatology? by US NOAA http://www.ncdc.noaa.gov/paleo/primer.html

Earth's Climatic History by Pidwirny
http://www.physicalgeography.net/fundamentals/7x.html

Global Warming Facts and Our Future
https://www.koshland-science-museum.org/explore-the-science/earth-lab

Causes of Climate Change by US EPA http://www.epa.gov/climatechange/science/causes.html

Encyclopedia of Earth: GH effect
http://www.eoearth.org/view/article/153146/

Simple Models of Climate Change by Weart
http://www.aip.org/history/climate/simple.htm

GCMs by Weart http://www.aip.org/history/climate/GCM.htm

IPCC Chapter on GCMs
http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter8.pdf

Food Quality by Bloom
http://ucce.ucdavis.edu/files/repositoryfiles/ca6302p67-65646.pdf

Encyclopedia of Earth: Biosphere, Ecosystem Disturbance, Species Shifts
http://www.eoearth.org/topics/view/54257/

IPCC Mitigation of Climate Change Report, Transportation
http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch5.html

IPCC Mitigation of Climate Change Report, Energy Supply
http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch4.html

IPCC Mitigation of Climate Change Report, Chapt. 6-10
http://www.ipcc.ch/publications_and_data/ar4/wg3/en/contents.html

The Economics of Climate Change: A Primer by CBO http://www.cbo.gov/publication/14387
Requiem for Kyoto by Nordhaus & Boyer http://www.econ.yale.edu/~nordhaus/homepage/Kyoto.pdf

United Nations Framework Convention on Climate Change
http://unfccc.int/2860.php

Global Warming Politics by Shellenberger & Nordhaus http://thebreakthrough.org/images/Death_of_Environmentalism.pdf

Welcome to Doomsday by Moyers
http://billmoyers.com/2005/02/25/welcome-to-doomsday-march-24-2005/

Assignments and Grading Scheme

Grading System

Letter grades (from highest to lowest) A+, A, A−, B+, B, B−, C+, C, C−, D+, D, D−, and F are used.

Grading Policy

Grades are based on the following:

First Exam	15%
Second Exam	15%
Final Exam	50%
Assignments	10%
Class attendance	10%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

Students are expected to attend all classes. You cannot pass the class under any circumstances if you miss more than six classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	21/9/2014	Chapter 1 - Introduction to Global Climate Change *The Discovery of Global Warming* by Spencer Weart *Global Climate Change Research Explorer*
2	28/9/2014	Chapter 2 - History of Earth's Climate *What is Paleoclimatology?* by US NOAA *Earth's Climatic History* by Pidwirny
Eidul-Adha Break (5/12/2014-10/12/2014)		
3	12/10/2014	Chapter 3 - Causes of Climate Change *Global Warming Facts and Our Future* *Causes of Climate Change* by US EPA Encyclopedia of Earth: *GH effect*
4	19/10/2014	Chapter 4 - World of Tomorrow: Computer Simulation Models *Simple Models of Climate Change* by Weart *GCMs* by Weart IPCC *Chapter on GCMs*
5	26/10/2014	Chapter 5 – Biological Impacts of Higher Carbon Dioxide Concentrations *Food Quality* by Bloom

6	2/11/2014	Chapter 6 - Climate Change and the Biosphere Encyclopedia of Earth: *Biosphere*, *Ecosystem Disturbance*, *Species Shifts*
7	9/11/2014	Chapter 7 – Mitigation Strategies: Transportation IPCC Mitigation of Climate Change Report, *Transportation*
8	16/11/2014	Chapter 8 – Mitigation Strategies: Electric Power Generation IPCC Mitigation of Climate Change Report, *Energy Supply*
9	23/11/2014	Chapter 9 – Mitigation Strategies: Other Sectors IPCC Mitigation of Climate Change Report, *Chapt. 6-10*
10	30/11/2014	Chapter 10 - Economics of Global Climate Change *The Economics of Climate Change: A Primer* by CBO *Requiem for Kyoto* by Nordhaus & Boyer
11	7/12/2014	Chapter 11 - Global Climate and the Law United Nations *Framework Convention on Climate Change*
12	14/12/2014	Chapter 12 - Global Climate Change: The Human Response *Global Warming Politics* by Shellenberger & Nordhaus *Welcome to Doomsday* by Moyers

The CLIMASP Course Modules

Course Syllabus

Course Number: (**110302238)**

Teaching Methods of Chemistry and Geology Concepts
Hashemite University, Faculty of Educational Sciences, Department of Curricula & Instruction,
Fall Semester, 2014-2015

Instructor Information

Instructor: Dr. Ahmad Qablan
Office Location: Economics Building 241
Telephone: Ext. 5070
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E-mail: ahqablan@gmail.com
Website:

Course Description/Overview

This course intends to help education students to incorporate several contemporary teaching strategies to teach chemistry and geology concepts. Case method teaching can increase students' interests in studying chemistry, concept mapping deepens student understanding, Predict-Observe-Explain (POE) strategy increases the level of classroom interaction, workshops and problem-based learning provide students with an opportunity to acquire effective problem solving techniques, 5E instructional model helps students design and teach their science lessons in an interactive way.

Course Learning Objectives

The overarching goals of this course are: a) to help students understand the constructivist perspective in designing learning experiences. b) Encourage students to link the scientific concepts to relevant environmental and sustainability issues to enable learners to become reflective learners, know their roles and responsibilities of an active citizen, and contribute in maintaining a sustainable future for all; and c) design and deliver their own science lessons in the classroom.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

83. Discuss the various epistemologies of curricula addressing issues of education for sustainability.
84. Connect their science content to the environment and sustainability issues.
85. Develop a lesson plan built according to the 5E instructional model and deliver it in the classroom.
86. Use social media (i.e. Facebook) to communicate with their classmates and contribute in raising their environmental sustainability awareness.
87. Apply recent classroom teaching techniques in their teaching and especially those that enhance students' critical thinking and reflective learning skills.
88. Demonstrate awareness and ability to advocate for sustainability education in their teaching.

Course Resources

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class

- Rodger W. Bybee, Joseph A. Taylor, April Gardner, Pamela Van Scotter, Janet Carlson Powell, Anne Westbrook, and Nancy Landes. (2006). The BSCS 5E Instructional Model: Origins and Effectiveness. A Report Prepared for the Office of Science Education. National Institutes of Health.

- Rodger W. Bybee. (2009). A Commissioned Paper Prepared For A Workshop On Exploring The Intersection Of Science Education And The Development Of 21st Century Skills. The National Academies, Board on Science Education.

- Baodi Gou. (2003). Contemporary teaching strategies in general chemistry. The China Papers.

- UNESCO. (2010). Teaching and Learning for a Sustainable Future.
    - Curriculum Rationale.
    - Across the curriculum.
    - Contemporary issues.
    - Teaching and learning strategies.

- Keeley. Page. (2008). An introduction to formative assessment classroom techniques. Science Formative Assessment: 75 Practical Strategies for Linking Assessment, Instruction, and Learning.

- Keeley. Page. (2008). Integrating FACTS with instruction and learning. Science Formative Assessment: 75 Practical Strategies for Linking Assessment, Instruction, and Learning.

- Keeley. Page. (2008). Get the FACTs! 75 science formative assessment classroom techniques. Science Formative Assessment: 75 Practical Strategies for Linking Assessment, Instruction, and Learning.

Assignments and Grading Scheme

Grading Policy

Grades can be based on the following:

Assignments	20%
Exams	60
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than 6 classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)

1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites.
2		The BSCS 5E Instructional Model: Origins and Effectiveness. Part I.
3		The BSCS 5E Instructional Model: Origins and Effectiveness. Part II.
4		A Commissioned Paper Prepared For A Workshop On Exploring Intersection Of Science Education And The Development Of Century Skills. Part I.
5		A Commissioned Paper Prepared For A Workshop On Exploring Intersection Of Science Education And The Development Of Century Skills. Part II.
6		Contemporary teaching strategies in general chemistry
7		Teaching and Learning for a Sustainable Future. • Curriculum Rationale.
8		Teaching and Learning for a Sustainable Future. • Across the curriculum.
9		Teaching and Learning for a Sustainable Future. • Contemporary issues.
10		Teaching and Learning for a Sustainable Future. • Teaching and learning strategies.
11		An introduction to formative assessment classroom techniques.
12		Integrating FACTS with instruction and learning

13		Get the FACTs! 75 science formative assessment classroom techniques.
14-16		Students' lesson plans presentations.

Course Syllabus

Course Number: (**110302238)**

Education for Sustainable Development

Hashemite University, Faculty of Educational Sciences, Department of Curricula & Instruction,

Fall Semester, 2014-2015

Instructor Information

Instructor: Dr. Ahmad Qablan

Office Location: Economics Building 241

Telephone: Ext. 5070

Office Hours:

E-mail: ahqablan@gmail.com

Website:

Course Description/Overview

Education is the most effective means that society possesses for confronting the challenges of the future. Indeed, education continuously shapes and reshapes the world of tomorrow. As the world is facing serious environmental problems that could threaten the existence of all mankind on earth, the course "teaching and learning for a sustainable world" comes to help teachers better prepare future generations on how to deal with various environmental problems and issues. It seeks to help them better understand the complexity of the world around us? How are the problems of our world interconnected, and what does that imply for their solution? What kind of world do we want for the future, within the limits of our Earth's life support systems? How can we reconcile the requirements of economy, society, and the environment?

The course intends to strengthen teachers' capacities to learn diverse ways to reorient their everyday classroom teaching and learning and address the global and local environmental concerns. The course adopts Inquiry-based learning approach as an overall guiding model of learning. Inquiry is most consistent with development of the skills for lifelong learning as it prepares learners to know what to do when the options before them are not clear. Inquiry approach is directed by questions that learners work together to address. Both process and products of learning are assessed.

Course Learning Objectives

Educating for a sustainable future is not so much about a destination as about the process of learning to make decisions that consider the long-term economy, ecology and equity of all communities. Its goal is to build an enduring society, which involves learning how to anticipate the consequences of our actions envision a sustainable future and create the steps needed to achieve the vision. Individuals and societies will perpetually have to make choices. How those choices are made and the information and ethical discernment used in making them will determine whether our visions of a sustainable future are achieved.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

- To develop an appreciation of the scope and purpose of educating for a sustainable future.
- To clarify concepts and themes related to sustainable development and how they can be integrated in all subject areas across the school curriculum.
- To enhance skills for integrating issues of sustainability into a range of school subjects and classroom topics.

- To enhance skills for using a wide range of interactive and learner-centred teaching and learning strategies that underpin the knowledge, critical thinking, values and citizenship objectives implicit in reorienting education towards sustainable development.
- To encourage wider awareness of Information and Communication Technologies (ICTs), the potential of multimedia-based approaches to education and the potential of the Internet as a rich source of educational materials.
- To enhance skills in computer literacy and multimedia education.

Course Resources

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class

- UNESCO. (2010). Teaching and Learning for a Sustainable Future.
    - Curriculum Rationale.
    - Across the curriculum.
    - Contemporary issues.
    - Teaching and learning strategies.

- NOAA Costal Services Center. (2010). Local Strategies For Addressing Climate Change.
- International Alliance of Leading Education Institute. (2009). Climate Change and Sustainable Development: The Response from Education: A cross-national report.
- West Coast Environmental Law. (2012). Preparing for Climate Change: An Implementation guide for local governments in British Columbia.

- Agyeman, Julian, Robert D. Bullard and Bob Evans (Eds.) (2003). Just Sustainabilities: Development in an Unequal World. London: Earth scan. (Introduction and conclusion.).

- Ayers, Jessica and David Dodman. (2010). “Climate change adaptation and development: the state of the debate”. Progress in Development Studies 10 (2): 161-168.

- Baker, Susan. (2006). Sustainable Development. Milton Park, Abingdon, Oxon; New York, N.Y.: Routledge. (Chapter 2, “The concept of sustainable development”).

- Brosius, Peter (1997) “Endangered forest, endangered people: Environmentalist representations of indigenous knowledge”, Human Ecology 25: 47-69.

- Lohman, Larry (2003) “Re-imagining the population debate”. Corner House Briefing 28.

- Martínez-Alier, Joan et al. (2010). “Sustainable de-growth: Mapping the context, criticisms and future prospects of an emergent paradigm” Ecological Economics 69: 1741-1747.

- Merchant, Carolyn (Ed.) (1994) Ecology. Atlantic Highlands, N. J: Humanities Press. (Introduction, pp 1-25.)

- Osorio, Leonardo et al. (2005). “Debates on sustainable development: towards a holistic view of reality”. Environment, Development and Sustainability 7: 501-518.

- Robbins, Paul (2004) Political Ecology: A Critical Introduction. Blackwell Publishing.

Assignments and Grading Scheme

Grading Policy

Grades can be based on the following:

Assignments	20%
Exams	60
Class attendance/participation	20%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than 6 classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 20% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		**Course Overview** Discussion of syllabus and assignments, course requirements and prerequisites.
2-4		**Module 1: Introducing ESD**: An introduction to global realities, imperatives for sustainable development and educational issues that form the rationale for Educating for a Sustainable World. The topics that will be explored through this module are: • Exploring global realities • Understanding sustainable development • Reorienting education for a sustainable future
5-8		**Module 2: Sustainable Development across the Curriculum**: An overview of ways in which Educating for a Sustainable Future can be integrated into all areas of the curriculum. The topics that will be explored through this module are: • Sustainable futures across the curriculum • Learning Cycle as a model of inquiry teaching and learning • Supporting strategies to connect between instruction, assessment, and classroom management
9-12		**Module 3: Current Issues:** An illustration of how different curriculum themes may be reoriented to integrate an

		interdisciplinary emphasis on sustainable futures. The topics that will be explored through this module are: • Understanding world hunger • Population & development • Culture for a sustainable future • Women & sustainable development • Sustainable communities
13-16		**Module 4: Teaching & Learning Strategies**: Practical advices on using teaching and learning strategies that can help students achieve the wide range of knowledge, skill and values objectives of Education for Sustainable Development. The topics that will be explored through this module are: • Experiential learning • Storytelling • Inquiry learning • Future Problem Solving • Learning outside the classroom • Community Problem Solving

fall Semester 2014/15

Econometrics (110201327)

SYLLABUS

Dr. Usama Robin alqalawi
Office number: 334 economic and managerial since
Email: urmal-qalawi@hu.edu.jo

Office Hours: .....
Meeting Times:.....

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Required Text and Supplements

1- Harris, Jonathan M., and Brian Roach. *Environmental and natural resource economics: A contemporary approach*. ME Sharpe, 2013.
2- Van den Bergh, Jeroen CJM, ed. *Handbook of environmental and resource economics*. Edward Elgar Publishing, 2002

Supporting Material:

Over the Internet**:** see website http://www.gdae.org/environ-econ.

Course Objectives:

This course analyzes the environmental problem from economics perspective. Issues regarding the use of scarce natural resources and its impact on the surrounding environment will extensively covered. The course will cover both general methodological principles and specific applications. We will consider the efficient and reasonable use of society Environmental resources such as the atmosphere, water, land, , and ecological systems.

Grading

The final grade distribution is as follows:

Homework's, Attendance, In-Class Exercises, Quizzes:… . 10 Points
First Midterm: …… (Ch. I and 1-6)… …….. 20 Points
Second Midterm: …… (Ch. I and 8-11)… …….. 20 Points
Project ……. … 10 Points
Final Exam: To be announced …(comprehensive) …… 40 Points
Total:……100 Points

Learning Outcomes:

Knowledge outcomes

- A broad knowledge of environmental problem.
- Theoretical background for the standard methods used in empirical analyses

Skills

- The ability to critically and systematically analyze and evaluate policies and programs.
- Practice environmental and natural resource decision-making.

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Competence

- ethical commitment
- Ability to analyze and synthesize

Quizzes and Exams:

I will **NOT** accept excuses for missed exams or quizzes. Arrangements of using make-up exam can be made in advance in extraordinary circumstances. No make-up quiz will be held. The final examination will be comprehensive

Homework:

Homework is assigned and graded. Homework problems are to be considered an integral part of the course. It is up to the students to make sure he/she knows how to solve the problems in homework set. The exams will be designed to distinguish students who work out and study the homework problems.

Lectures Schedule

Week (1-6)

- Chapter 1: **Changing Perspectives on the Environment (3 lectures)**

1. Economics and the Environment.
2. A Framework for Environmental Analysis
3. Environmental Microeconomics and Macroeconomics

- Chapter 2 : **Resources, Environment, and Economic Development (3 lectures)**
  1. A Brief History of Economic Growth and the Environment
  2. A Summary of Recent Growth
  3. The Future of Economic Growth and the Environment
  4. Sustainable Development
- Chapter 3 : **The Theory of Environmental Externalities (3 lectures)**
  1. The Theory of Externalities
  2. Welfare Analysis of Externalities
  3. Property Rights and the Environment

- Chapter 4 : **Common Property Resources and Public Goods (3 lectures)**
  1. Common Property, Open Access, and Property Rights
  2. The Environment as a Public Good
  3. The Global Commons
- Chapter 6: **Valuing the Environment**
  1. Total Economic Value
  2. Overview of Valuation Techniques
  3. Cost-Benefit Analysis **(4 lectures**)

- Review **(1 lecture**)
- First Midterm **(1 lecture**)

Week 7- 12

- Chapter 8: **National Income and Environmental Accounting (4 lectures)**
  1. Greening the National Income Accounts
  2. Environmentally-Adjusted Net Domestic Product
  3. Adjusted Net Saving
  4. The Genuine Progress Indicator
  5. The Better Life Index
  6. Environmental Asset Accounts
  7. The Future of Alternative Indicators
- Chapter 9: **Population and the Environment(4 lectures)**
  1. The Dynamics of Population Growth

2. Predicting Future Population Growth
3. The Theory of Demographic Transition
4. Population Growth and Economic Growth
5. Ecological Perspectives on Population Growth
6. Population Policies for the Twenty-First Century

- Chapter 10: **Agriculture, Food and Environment(4 lectures)**
  1. Feeding the World: Population and Food Supply
  2. Trends in Global Food Production
  3. Projections for the Future
  4. Agriculture's Impact on the Environment
  5. Sustainable Agriculture for the Future?
- Chapter 11: **Resources: Scarcity and Abundance (4 lectures)**
  1. The Supply of Non-Renewable Resources
  2. Economic Theory of Non-Renewable Resource Use
  3. Global Scarcity or Increasing Abundance?
  4. Environmental Impacts of Mining
  5. The Potential for Recycling
- **Review (1 lecture**)

- **Second midterm (1 lecture**)

Week 13

- Chapter 12: **Energy: The Great Transition (3 lectures)**
  1. Energy and Economic Systems
  2. Evaluation of Energy Sources
  3. Energy Trends and Projections
  4. Energy Supplies: Fossil Fuels
  5. The Economics of Alternative Energy Futures
  6. Policies for the Great Energy Transition
- **Review (1 lecture**)

Week 14

- **Final Exam**

Classroom Rules

1-Students must show the most respect toward each other and the instructor.
2-Come to class on time , and don't leave early unless permission has been obtained.
3- Students should not carry conversations with each other, or talk to cell phone during class lecture and discussion.
4- Students are not allowed to read non-assigned materials.
5- It's the student responsibility to inform the instructor " **a week** " prior if there is a conflict with an exam.
6- It's the student responsibility to know how to deal with Module.

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number: ??

Renewable Energy Resources

The Hashemite University, Faculty of Natural Resources and Environment, Department of Water Management and Environment,

Fall Semester, 2014-2015

Instructor Information

Instructor: Dr. Mahmoud Abu-Allaban
Office Location: The Hashemite University Campus
Telephone: Office – +962 -5- 3903333 4567

Office Hours: S M TH 8.00-10.00
E-mail: mlaban@hu.edu.jo
Website:

Course Identification

Course Number: ??
Course Name: Renewable Energy Resources
Course Location: University Campus
Class Times: Wednesday 5:00pm – 8:00am
Prerequisites: Basic concepts in math and science
Faculty Web Page:

Course Description/Overview

Energy plays a dominant role in our modem industrial society. Rapid growth of energy consumption has had a noticeable impact on the climate. This course will address the issues of sources of renewable, energy conversion technologies, air pollution and other environmental effects related to energy extraction and consumption, and finally the important issues of conservation and public policy. The course will also explore society's present needs and future energy demands, and focus on alternate, renewable energy sources such as solar, biofuel, wind power, geothermal, and hydropower. Energy conservation methods will be emphasized.

Course Learning Objectives

Upon the completion of this course students should be familiar with major renewable energy technologies and their implications on the climate systems. Students will understand the principals of solar, wind, hydropower, geothermal, and biomass, and appreciate their roles in reducing atmospheric carbon.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. List and generally explain the main sources of energy and their implications in the climate;

2. Describe the challenges and problems associated with the use of various energy sources, including fossil fuels, with regard to on-going climate change;

3. Discuss remedies and potential solutions to climate change issues associated with fossil fuels;

4. List and describe the primary renewable energy resources and technologies.

5. Convert units of energy—to quantify energy demands and make comparisons among energy uses, resources, and technologies.

6. Collect and organize information on renewable energy technologies as a basis for further analysis and evaluation.

Course Resources

Course Website(s)

Required Course Texts and Materials

Energy Systems and Sustainability: Power for a Sustainable Future
by Godfrey Boyle, Bob Everett, and Janet Ramage. Oxford University Press, ISBN: 0-19-926179-2.

Real Goods Solar Living Sourcebook: The Complete Guide to Renewable Energy
by John Schaeffer.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

Letter grades (from highest to lowest) A+, A, A−, B+, B, B−, C+, C, C−, D+, D, D−, and F are used.

Grading Policy

Grades are based on the following:

First Exam	15%
Second Exam	15%
Final Exam	50%
Assignments	10%
Class attendance	10%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

Students are expected to attend all classes. You cannot pass the class under any circumstances if you miss more than six classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics
1	21/9/2014	Introduction to energy systems and resources
2	28/9/2014	Energy efficiency, sustainability & the environment
Eidul-Adha Break (5/12/2014-10/12/2014)		
3	12/10/2014	Quantifying energy & energy arithmetic Heat to motive power
4	19/10/2014	Electricity - a primer Fossil fuels - past, present & future
5	26/10/2014	Remedies & alternatives for fossil fuels CHP/cogeneration Energy efficiency and conservation
6	2/11/2014	Solar - thermal Solar - PV
7	9/11/2014	Green building
8	16/11/2014	Wind – small & large Hydro – small & large Wave & tidal
9	23/11/2014	Geothermal
10	30/11/2014	Biofuel
11	7/12/2014	Biodiesel - uses, production, processes, ethanol - issues & future prospects
12	14/12/2014	Fuel cells

		Transportation - hybrids, flexfuels, fuel cells

CLIMASP COURSE MODULES TEMPLATE

Instructor: **Dr. Theodora De Baz**

Course	**Biological Concepts and Methods of Teaching Biology**
Module 1	**Diversity of Living Organisms:**
Key Concepts	Biodiversity, Taxonomy, Food Chain, Climate Change, Sustainability.
Overview	Asking students what is meant by biodiversity and why the classification procedure helps in understanding biodiversity better. Emphasis will be made on the inter-dependence of the biotic components in our ecosystems: producers, consumers, and decomposers. Questions to be addressed in this module include the following: What are the impacts climate change on plants, animals, aquatic life, and human well-being? Does climate change cause loss among species, and why is it considered as one of the major current threats to biodiversity.
Aim	The main aim of this module is to introduce students to the wide variety of living organisms in a natural habitat, and explore the benefits of biodiversity. Emphasis will be made on the enormous impacts of the environmental conditions that can be collectively coined "climate change" on species diversity and people's livelihoods.
Learning Outcomes	At the end of this module, students will be able to: • Identify and discuss the classification of living organisms. • Explain how plants and animals support each other in the food chains

	or food webs. • Discuss that biodiversity have direct and indirect economic benefits to humans as well as to our ecosystem. • Identify the threats caused by climate change to biodiversity and habitat loss. • Become aware of the over-exploitation of the forest resources through deforestation. • Appreciating the ethical aesthetic values of the different types of ecosystems. • Act as a responsible citizen for preserving the ecosystems for the present and future generations.
Units	Unit 1.1 Monera Unit 1.2 Protista Unit 1.3 Funji: Zygomycota, Ascomycota, Basidiomycota Unit 1.4 Plantae Kingdom: Bryophytes and Ferns, Gymnosperms, Angiosperms: Monocotyledons & Dicotyledons Unit 1.5 Animalia Kingdom: Porifera, Cooelenterate. Platyhelminthes, Nematoda, Annelid, Arthropoda, Mollusca, Echinodermata, Protochordata, Vertbra: Pieces, Amphibia, Reptila, Aves, Mamilla.
Readings	Laurance, W.F. Habitat destruction: death by a thousand cuts Lovejoy, T. E. (2010). Climate Change. In: Sodhi NS, Ehrlich PR, editors. Conservation Biology for All. Great Clarendon Street, Oxford: Oxford University Press. P. 153-162. Climate change Lovejoy, T. & Hannah, L. (2006). Climate Change and Biodiversity. TERI Press. ISBN 81-7993-084-X. Maciver, D., & Dallmeir, F. (2008). Climate Change and Biodiversity in the

	Americans. Symposium held at the Smithsonian Tropical Research Institute, Panama, February 25-29. Online at: www.climatechangeandbiodiversity.ca. Rediscovering Biology: Online Textbook Unit 12, Annerberg Media: Online at:www.learner.org/courses/biology/textbook/biodiv Sodhi, N. S. & Ehrlich, Conserving Biology for All http://www.mongabay.com/conservation-biology-for-all.html
Activity	**Assignment 1: Drawing A Classification Chart** This activity will develop students' skill in organizing their knowledge into a concept map. **Assignment 2: Identifying Food Chains** In small groups, students discuss the connections between species and brainstorm examples of food chains. **Assignment 3:** Writing reports on the fauna and flora in the country, with special emphasis on the trees and wild plants.
Module 2	**Cell and Tissue Structure and Function:**
Key Concepts	The Cell, The Cell Theory, Cytology, Animal Cell, Plant Cell, Animal Tissues, Plant Tissues, Skin Care and protection.
Overview	Students are introduced to the most basic unit of structural organization within living things that consist of many parts, called organelles. The nucleus contains genetic material that determines an organism's chemical and physical characteristics. Cells vary in their shape and function. Similar

	cells working together are collectively called a tissue. Emphasis are also made on the importance of taking good care of our body cells and , and preventing the physical agents such as heat and harmful UV radiation that may damage cells by coagulating their contents. Smoking is another cause of skin damage and premature aging.
Aim	The aim of this module is discuss the anatomy and physiology of the cell/tissue structures and the physiological processes which occur therein within living organisms.
Learning Outcomes	At the end of the module, learners will be able to: • Describe the structure and function of the different cell organelles and how they are assembled. • Describe the different organelles and their functions. • Describe the main types of tissue, their classification, structure, and the physiological processes that occur therein • Practice personal hygienic behaviors
Units	2:1 Cell Theory, Animal and Plants Cells 2:2 Cell Organelles: cell membrane, nucleus and DNA replication; ribosome and protein synthesis; centriole and cell division (mitosis and meiosis); lysosomes and role in phagocytosis ; mitochondria and cellular respiration; golgi apparatus; cytoskeleton and cell motility; endoplasmic reticulum and functions. 2:3 Plant Tissues: Meristematic, Collenchyma, Parenchyma, Sclerenchyma, Xylem, Phloem 2:4 Animal Tissues: Epithelial, Connective, Muscular, Nervous
Readings	Campbell, Reece, Taylor, Simon, Dickey 2009, Biology Concepts and

	Connections, 6th Edition, Pearson [ISBN: 978-0-321-52650-2] Krogh, David 2009, Biology, A Guide to the Natural World, 4th Edition, Pearson [ISBN: 978-0-321-56371-2] Neil A. Campbell, BIOLOGY [ISBN: 0-13-135691-7] Wayne M. Becker... [et al.], The World of the Cell [ISBN: 0805393935]
Activity	Assignment: Writing a report on how to care for our skin and protect it from harmful radiation.
Module 3	**Human Body Systems**
Key Concepts	Human Body Systems: Digestive, Respiratory, Circulatory, Nervous.
Overview	The human body is made up of several organ systems that all work together as a unit to make sure the body keeps functioning. There are ten major organ systems in the body, each of which plays a different role in helping the body work. In this unity four body systems are discussed. The Circulatory system is made up of the heart, blood, and blood vessels. It is concerned with circulating blood to deliver oxygen and nutrients to every part of the body. The purpose of the Digestive System is to turn the food you eat into something useful for the body, and how the body uses this system to digest food so the cells can make energy. The purpose of the Respiratory System is to supply the blood and oxygen to all parts of the body. While the nervous system is the control center in the human body. It receives and interprets stimuli and transmits impulses to organs to coordinate all the body's actions and reactions. A discussion of the impact of climate change on food and nutrition security and global spread of infectious diseases will take place at the end of the unit.
Aim	The main purpose of this module is to present a review of the human body,

	its major systems, and their primary functions. This module contains four units, each with introduction to the structures and functions of that system.
Learning Outcomes	Upon completion of this module, the students should be able to: • Describe the anatomy and physiology of each major body system. • Define common terminology related to the anatomy and physiology of each body system. • Become aware that Climate Change have led to the emergence of large-scale environmental hazards to human health. • Develop an awareness of the impact of climate change has an on food and nutrition security and global spread of infectious diseases. • Acquire the vocabulary associated with the human body systems.
Units	4:1 The Digestive System & Nutrition 4:2 The Respiratory System 4:3 The Circulatory System 4:4 The Nervous System
Readings	Human Anatomy: Human Body Systems http://www. innerbody.com/the-human-body/ Biology: The Human Body, Brightstorm http://www.brightstorm.com/science/biology/the-human-body/

Activity	Students are asked to investigate the impacts of climate change on the community's public health and safety systems, and address the factors that have an effect on young children, older adults and people with medical conditions. (Heat waves can lead to heart strokes and dehydration)
Module 4	**Transfer of Energy: Photosynthesis & Cellular Respiration**
Key Concepts	Photosynthesis, Cellular Respiration,
Overview	Students are introduced to the process of photosynthesis and how usable energy is captured from sunlight by chloroplasts and is stored through the synthesis of sugar from carbon dioxide, and how how chemical energy in food is converted to a form of usable energy (ATP) during the process of Cellular Respiration. A discussion of the role played by photosynthesis in Climate Change mitigation is also discussed.
Aim	The main aim of this module is to compare Photosynthesis to cellular respiration, and explain how both are essential processes in Carbon cycle and transfer of energy in the ecosystem.
Learning Outcomes	At the end of the module, learners will be able to: • Demonstrate knowledge of Photosynthesis • Demonstrate knowledge of Cellular Respiration . • Discuss how Photosynthesis and Cellular Respiration are connected.

	• Understand the significant role photosynthesis plays in Climate Change Mitigation. • Act as a responsible and caring citizen who participates in projects involving planting trees.
Units	3.1 Photosynthesis: Light Absorption Spectrum, 3.2 Cellular Respiration: Aerobic and Anaerobic Respiration. 3.3 Climate Change Mitigation
Readings	Campbell, Reece, Taylor, Simon, Dickey 2009, Biology Concepts and Connections, 6th Edition, Pearson [ISBN: 978-0-321-52650-2] Krogh, David 2009, Biology, A Guide to the Natural World, 4th Edition, Pearson [ISBN: 978-0-321-56371-2] Neil A. Campbell, BIOLOGY [ISBN: 0-13-135691-7] Sodhi, N. S. & Ehrlich, Conserving Biology for All. Online at: http://www.mongabay.com/conservation-biology-for-all.html Wayne M. Becker... [et al.], The World of the Cell [ISBN: 0805393935]
Activity	Conducting an experiment "Photosynthesis and Respiration in Elodea". Students are asked to design an experiment which will allow them demonstrate the changes in carbon dioxide concentration associated with both respiration and photosynthesis in the fresh water plant *Elodea*.
Module 5	**Nature of Science, Teaching & Learning Strategies**
Key Concepts	Nature of Science, Educational Objectives, and Instructional Strategies, Climate Change, Sustainable Development.

Overview	Education is a key strategy for achieving a more sustainable society. Integrating the topic of climate change and related sustainability issues in teaching, support students in developing more holistic and interdisciplinary world views and understanding.
Aim	The aim of this unit is to introduce student to the nature of science, getting acquainted with the three domains of educational objectives, and offer practical advices on using teaching and learning strategies that can help students achieve the wide range of knowledge, skills and values for sustainable development.
Learning Outcomes	At the end of the module, learners will be able to: • Demonstrate knowledge of the nature of science • Discuss the three domains of the educational objectives. • Embrace the Five ESD competencies: To know, to be, to do, to work together, and to transform the world. • Adopt a number of values and attitudes: Preserving nature, concern for the future generations, living in harmony with the environment, and Secure full commitment to sustainable development at the personal, local, national, and global levels • Apply a number of instructional strategies in their teaching • Use scientific thinking processes to conduct investigations. •
Units	Unit 5:1 Nature of Science: Characteristics, Values, Assumptions Unit 5:2 Educational Objectives: Domains: Cognitive, Affective, Psychomotor Unit 5:3 Teaching & Learning Strategies:

	• Storytelling • Inquiry learning • Future Problem Solving • Learning outside the classroom • Community Problem Solving • Experiential learning
Readings	UNESCO. (2010). Teaching and Learning for a Sustainable Future. . Climate Change Education for Sustainable Development, **UNESCO.** Mustante, S. (2011). Teaching Biology for a Sustainable Future. **BioScience, 61** (10), 751. Online at: biosience:oxfordjournals.org/content/61/10/751.full. Robinson, Z. (2011). Teaching Climate Change in Higher Education: Barriers and Opportunities. In Haslett, France & Gedye (Eds.) . Pedagogy of Climate Change. Online at: www.gees.ac.uk/pub/other/pocc/chapter%204.pdf.
Activity	Assignment 1: Students are asked to write an essay about the local and global impact of the scientific discoveries and human activities on the living style of the population, health, and the biosphere. Assignment 2: When discussing the Education Objectives at the Affective Domain, students are asked to give examples of the values and ethics on sustainability that have to be considered, motivated, and sustained.

	Assignment 3: Dividing the class into groups. Each group is asked to introduce a teaching strategy and present a lesson to the class that deals with climate change or an environmental issue.

CLIMASP COURSE SYLLABUS TEMPLATE

Biological Concepts and Methods of Teaching Biology

مفاهيم بيولوجية وطرق تدريسها

Hashemite University

Faculty of Educational Sciences

Department of Curricula & Instruction

First Semester (Fall), 2014/2015

Instructor Information

Instructor: **Dr. Theodora De Baz**

Office Location: Faculty of Educational Sciences, Economics Building Room 139

Telephone: Office – 5 390 3333, Ext. 4211
Office Hours: 1:00 – 2:00 Sunday –Tuesday - Thursday
E-mail: tdebaz@gmail.com

Course Identification

Course Number: **110302130**

Course Name: **Biological Concepts and Methods of Teaching Biology**

Course Location: Economics Building

Class Times: Section 1: Sunday, Tuesday & Thursday 2:00-3:00
Section 2: Monday & Wednesday 8:00-9:30

Faculty Web Page: http://www.hu.edu.jo

Course Description/Overview*

This course will introduce students to the principles of biological sciences, the diversity of living organisms, cells and tissues structure and function, human body systems, nutrition and good health, energy transfer in plants (photosynthesis and cellular respiration), genetics, nature of science, educational objectives, constructivism approach, and methods of teaching theses topics, namely: cooperative learning , concept maps, conceptual change, scientific projects, dry labs, STS, and how the principles of climate change and sustainable development (ESD) could be effectively integrated into the biological concepts and the instructional methods.

Course Learning Objectives

The general objectives of this course are as follows:

1- Classify the Living organisms according to Six-Kingdoms and three-Domain classification systems.
2 - Appreciate the value of diversity
3- Understand the range of local and international issues facing today's global Community.

4- Demonstrate knowledge of the process of Photosynthesis and the significant role it plays in Climate Change Mitigation.
5- Demonstrate knowledge of Cellular Respiration and how chemical energy in food is converted to a form of usable energy (ATP).
6- Compare photosynthesis to cellular respiration, and how both are essential processes in Carbon cycle and transfer of energy in the ecosystem
7- Describe the relation of form, function of cells structures and tissues.
8- Describe the structure and explain the function of human body systems.
9- Describe mechanisms that living organisms use to combat disease.
10- Integrate the principles of Nature of science
11- Employ a variety of effective ESD teaching techniques in presenting scientific concepts.
12- Appreciate the concept of becoming life-long learners and developing competencies in integrating ESD strategies in their teaching

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

A) Demonstrate knowledge of biology concepts.

B) Embrace new behaviours and practices that contribute to becoming responsible active citizens who contribute to building a sustainable world, through adopting values and ethics conductive to climate change and global understanding.

C) Tackle environmental problems and become aware of the issues related to environmental destruction, and how contribute to building a better world.

D) Act as a member of a global community in working individually and collectively towards a better man-nature relationships.

Through applying various pedagogical strategies e.g.: group-work, self reflection, peer discussions on global real life topics or controversial issues, in addition to employing alternative means of assessment, as performance tasks, data gathering assignments, research projects, oral presentations and portfolios.

Course Resources

Required Course Texts and Materials

Laurance, W.F. Habitat destruction: death by a thousand cuts

Lovejoy, T. E. (2010). Climate Change. In: Sodhi NS, Ehrlich PR, editors. Conservation Biology for All. Great Clarendon Street, Oxford: Oxford University Press. P. 153-162. Climate change

Lovejoy, T. & Hannah, L. (2006). Climate Change and Biodiversity. TERI Press. ISBN 81-7993-084-X.

Maciver, D., & Dallmeir, F. (2008). Climate Change and Biodiversity in the Americans. Symposium held at the Smithsonian Tropical Research Institute, Panama, February 25-29. Online at: www.climatechangeandbiodiversity.ca.

Rediscovering Biology: Online Textbook Unit 12, Annerberg Media: Online at:www.learner.org/courses/biology/textbook/biodiv

Sodhi, N. S. & Ehrlich, Conserving Biology for All **http://www.mongabay.com/conservation-biology-for-all.html**

Campbell, Reece, Taylor, Simon, Dickey 2009, Biology Concepts and Connections, 6th Edition, Pearson [ISBN: 978-0-321-52650-2]

Krogh, David 2009, Biology, A Guide to the Natural World, 4th Edition, Pearson [ISBN: 978-0-321-56371-2]

Neil A. Campbell, BIOLOGY [ISBN: 0-13-135691-7]

Wayne M. Becker... [et al.], The World of the Cell [ISBN: 0805393935]

Human Anatomy: Human Body Systems. Online at: http://www. innerbody.com/the-human-body/

Biology: The Human Body, Brightstorm. Online at: http://www.brightstorm.com/science/biology/the-human-body/

UNESCO. (2010). Teaching and Learning for a Sustainable Future.

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Climate Change Education for Sustainable Development, **UNESCO.**
Mustante, S. (2011). Teaching Biology for a Sustainable Future. **BioScience, 61** (10*)*, 751. Online at: biosience:oxfordjournals.org/content/61/10/751.full.

Robinson, Z. (2011). Teaching Climate Change in Higher Education: Barriers and Opportunities. In Haslett, France & Gedye (Eds.) . Pedagogy of Climate Change. Online at: www.gees.ac.uk/pub/other/pocc/chapter%204.pdf.

Assignments and Grading Scheme

- **First Hour Exam (15%)**
- **Second Hour Exam (15%)**
- **Practical Assignments and Attendance (20%)**
- **Final Exam (50%)**

Important Dates to Remember

Course Schedule

Week	Topics
1+2	Diversity of Living Organisms
3	Cell and Tissue Structure and Function
4	Photosynthesis
5	Cellular Respiration

6	**First Hour Exam**
7	Human Body Systems - The Digestive System - The Heart and the Circulatory System
8	Human Body Systems - The Respiratory System - The Nervous System - Nutrition and Health
9	**Second Hour Exam**
10	Nature of Science
11	Educational Objectives
12	Constructivism in Teaching Science
13	Instructional Strategies
14	Instructional Strategies
15	Review
16	**Final Exam**

Course Policies

Attendance is required for all course sessions. Students are expected to participate in all class discussions, small group work, report writing, presentations, and other class activities.

Mobile phones should be turned off. Each student must bring to class his textbook, notebook, and pens, and is responsible for knowing the reading materials assigned, as well as what information was included in the lectures and class discussions. Make-up tests will be given only in the event of valid excuse. Acts of dishonesty include (but not limited to) cheating, plagiarism, and forgery. Plagiarism is defined as the

"unacknowledged use of someone else's work is in effect an attempt to deceive one's reader into thinking it is one's own work". This includes handing in the product of other students, or complete papers and materials from the Internet. Academic dishonesty will impact the continuation of the course and can jeopardize the successful completion of the program.

Course	**Developmental Biology**
Module 1	Introduction to developmental biology
Key Concepts	Embryo, questions of developmental biology, genomic equivalence
Overview	In this module we set the distinction between developmental biology and embryology and introduce the definition of the science and all the progress that has happened for this science since 350 bc. We will also discuss the difference between epigenesis and preformation. One of the most difficult questions of developmental biology is what breaks egg symmetry, we will try to answer the question
Aim	To understand the main questions asked by developmental biologists and the tools used to answer these questions.
Learning Outcomes	At the end of this module learners will be able to: • Understand how a single cell (the fertilized egg) can give rise to an adult • Understand how one adult can give rise to another adult
Units	Unit 1.1 Introduction to Developmental Biology Unit 1.2: Genomic Equivalence Unit 1.3: Cell-Cell Communication
Readings	Developmental Biology, Scott Gilbert, Sinauer Associates Inc., 2010, 9th ed
Activity	**1) Assignments:** 1. What is the role played by cell migration in development? 2. How is the egg symmetry broken?

	2) Role play: 1. Pick your role is with or against epigenesis. Apply your knowledge to your argument 2. Set up a play where each student is a model organism used in the study of developmental biology, each will discuss the role of this organism in the achievements and discoveries **3) Laboratory experiments:** Two weeks of laboratory to examine the tools used in developmental biology such as microscope, Western blotting, PCR, RT-PCR …etc.
Module 2	Sex Determination
Key Concepts	Sex chromosome, SRY region of Y chromosome, Environment
Overview	In this module we will discuss the possible mechanisms to determine the sex of the fetus in the different model organisms with an emphasis on the SRY region in the Y chromosome in humans and its role in sex determination. In addition, we will discuss briefly the role of the environment and climate change in sex determination, since it was found that Y sperms are only generated in alligators in the hot environment.
Aim	To understand the process of sex determination in different model organisms
Learning Outcomes	At the end of this module learners will be able to: • Explain the different mechanisms of sex determination • Discuss the role of SRY region and its relation to infertility and sex characteristics
Units	Unit 2.1: Sex determination

Readings	- Developmental Biology, Scott Gilbert, Sinauer Associates Inc., 2010, 9th ed - www.pubmed.com
Activity	**1) Assignments:** 1. What is the role played by SRY region in development of testis? 2. How does climate change affects gender selection? **2) Visits to in vitro fertilization centre to see real cases of SRY-related infertility and visit to reproduction physiology clinic to see real cases of SRY mutation cases** **3) Laboratory experiments:** PCR, RT-PCR testing of SRY mutation
Module 3	Gametogenesis
Key Concepts	Spermatogenesis, oogenesis, maturation arrest
Overview	This module will cover spermatogenesis in details discussing the anatomy of the male reproductive system, histology of the testis, structure of the seminiferous tubule, the role of the different spermatogenic cells and somatic cells (Sertoli and Lyedig), and the endocrinology and physiology of this process. The same will be done for oogenesis with a focus on the onset and timing of oogenesis and the effects of endocrine disruptors and climate change of the hormonal regulation of gametogenesis
Aim	To examine the process of gametogenesis in males (spermatogenesis) and in females (oogenesis) with a focus on physiology and endocrinology
Learning Outcomes	At the end of this module learners will be able to: • Explain the development of the male and female reproductive systems • Discuss the structure and function of testis and ovary • Explain the process of spermatogenesis and oogenesis

Units	Unit 3.1: Spermatogenesis *Unit 3.2: Oogenesis*
Readings	- Developmental Biology, Scott Gilbert, Sinauer Associates Inc., 2010, 9th ed - www.pubmed.com
Activity	**1) Assignments:** 1. What is the difference between spermatogenesis and oogenesis in terms of timing of onset? 2. How does climate change affects gametogenesis focusing on endocrine disrupters? **2) Role play** **The students will be divided into two groups, one discussing spermatogenesis and the other oogenesis** **3) Laboratory experiments:** - Microscopy: Sections of testis and ovary of mammals will be studied - Seminal fluid analysis
Module 4	Fertilization
Key Concepts	Capacitation, Acrosomal reaction, Zygote, Oocyte activation
Overview	This part will cover fertilization which is the union of egg and sperm that results in the formation of a zygote. The students will study in detail the steps of fertilization which include sperm activation and transport, acrosomal reaction, fusion of the plasma membrane of the gametes, prevention of polyspermy, fusion of the genetic materials of the gametes and oocyte activation. In addition, the students will be introduced to the different modes of fertilization whether internal or external. Finally the students will be introduced briefly to the effects of global warming on

	fertilization.
Aim	This module will cover the process of fertilization in details, exposing the students to different modes of fertilization and the effect of global warming on fertilization
Learning Outcomes	At the end of this module learners will be able to: • Explain the difference between internal and external fertilization • Discuss the steps of fertilization
Units	Unit 4.1: Fertilization
Readings	- Developmental Biology, Scott Gilbert, Sinauer Associates Inc., 2010, 9th ed - www.pubmed.com
Activity	**1) Assignment**: Term paper about in vitro fertilization procedure and a summary of the clinics in Jordan **2) Research proposal:** Write a proposal about the guidelines and laws that should be implemented to govern in vitro fertilization procedures and practices **3) Laboratory experiments:** - Sperm activation and in vitro fertilization of sea urchin oocyte - Visit to in vitro fertilization clinic to watch the procedure of: semen analysis, oocyte pick up, oocyte denudation, insemination and fertilization
Module 5	**Gastrulation**
Key Concepts	Cleavage, Yolk amount and distribution, Cell movement
Overview	This module discusses the different patterns of embryo cleavage and the factors affecting it such as yolk amount and distribution and the position of spindle fiber. In addition, the students will learn about the cell cytoskeleton and the role played by actin filaments and microtubules on

	cell migration and movement during embryo gastrulation.
Aim	To introduce the students to the different patterns of gastrulation employed by model organisms and the different modes of cell migration.
Learning Outcomes	At the end of this module learners will be able to: • Explain the different patterns of cleavage • Discuss the role played by yolk and spindle fiber on cleavage pattern • Explain the different modes of cell migration on gastrulation
Units	Unit 5.1: From zygote to gastrula
Readings	- Developmental Biology, Scott Gilbert, Sinauer Associates Inc., 2010, 9th ed - www.pubmed.com
Activity	**1) Laboratory experiments:** Microscopy: whole mount and cross sections of different organisms gastrula (sea urchin, frog, and chicken)
Module 6	**Early Development in Sea Urchin, Amphibians, Aves, and Mammals**
Key Concepts	Blastopore, blastocoel, archenteron
Overview	This module accumulates all of the students' knowledge of embryogenesis and cell biology to give an over-all picture of the stages between fertilization and gastrula of four model organisms used widely in the studies of developmental biology. We will start with sea urchin since it is the simplest and its early development resembles that of humans. Then we will move to amphibians, the frog as a model, we will focus on the differences between its development and that of sea urchin and the factors that cause this change. We will spend around three weeks studying chick

	development since its grastrulation is similar to that of humans. Finally, we will discuss early stages of human development.
Aim	This module will cover the stages in embryogenesis between fertilization and gastrulation in sea urchin, frog, chicken and humans
Learning Outcomes	At the end of this module learners will be able to: • Apply the knowledge they received in the previous modules to understand the processes between fertilization and gastrulation in 4 model organisms • List the differences between the four model organisms in term of embryogenesis
Units	Unit 6.3: Early development in sea urchin Unit 6.4: Early development in frog Unit 6.5: Early development in chicken Unit 6.6: Early development in human
Readings	- Developmental Biology, Scott Gilbert, Sinauer Associates Inc., 2010, 9th ed - www.pubmed.com
Activity	**1) Assignment:** - Write a term paper about the differences in the four model organisms in term of embryogenesis - Write 2 pages about the choice of model organism to study each phase of embryogenesis **2) Laboratory experiments:** - Microscopy: whole mount and sections of embryos in different stages (cleavage, blastula and gastrula) of sea urchin, frog, and chick
Module 7	**Late Development in Mammals**
Key Concepts	Germ layers, Organogenesis, neurulation
Overview	As biology students are always curious about their own development, the last module will discuss the late stages of human development starting

	with germ layer differentiation to histogenesis to organogenesis. We will be able to cover one system development, the nervous system, a process known as neurulation. We will finish our course with a discussion of how the environment affect nervous system development causing such malformations as spina bifida and anencephaly.
Aim	To understand the processes of germ layer development focusing on nervous system development
Learning Outcomes	At the end of this module learners will be able to: • List the different derivatives of each germ layer • Explain the process of nervous system development
Units	Unit 7.1: Late development in human
Readings	- Developmental Biology, Scott Gilbert, Sinauer Associates Inc., 2010, 9th ed - www.pubmed.com
Activity	**1) Assignment:** Term paper about the development of the three germ layers **2) Role play:** The students will be divided into two groups, one group defending global warming and denying its effects on germ layer development and the other group against global warming. **3) Laboratory experiments:** - Whole mount and sections of human/mammalian neurula - Visit to paediatric clinic and/or OB/GYN clinic witness real cases of nervous system malformation

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Jerash University

Course Syllabus

College: Agriculture
Department: Food and Nutrition Science

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 607475
Course Name: Community Nutrition
Class Hours: (Times & Days)
Classroom: (Number & Building)

Prerequisites:

✓ **Course Description:**

This course will examine the role of nutrition in promoting, maintaining and improving health in the community. It investigates traditional aspects of the emerging health delivery system, as well as entrepreneurial programs in wellness. Students will study the financial, legislative, political, sociological, and scientific aspects of public and community health.
The overall objective of this course is providing an introduction to the practice of public health nutrition, discussion of significant public health nutrition problems, nutrition polices and physical activities, and nutrition programs available to the community.

✓ **Course Learning Objectives:**

1. Understanding the responsibilities of the community nutritionist
2. Nutrition program planning and evaluation strategies
3. Methods of nutritional assessment and intervention
4. Identification of nutrition programs and policies for various stages of the life cycle
5. Solving nutritional and health problems in a community setting

✓ **Expected Course Outcomes:**

1. Develop interventions to affect change and enhance wellness in diverse individual and groups.
2. Explain the impact of a public policy position on dietetics practice.
3. Explain the impact of health care policy and different health care delivery systems on food and nutrition services.

✓ **Course Resources:** (List the required course texts, course material, recommended websites, and other readings)

1. Reading material consists of handouts/internet websites.
2. Boyle, M. and Holben, D. 2013. Community Nutrition in Action: an entrepreneurial approach (6th edition). N.Y.:Thompson/Wadsworth.
3. http://www.ers.usda.gov/
4. http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/community-food-security.aspx
5. http://communityhealth.mc.duke.edu/dynamic/assets/ActionGuide.pdf

Part 3: Assignments, Course policies, and Grading Policy

✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

✓ ***Grade Components:***

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

✓ **Grading Policy:** In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

- ✓ **Course Policies:** All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to neither do their own work and neither gives nor receive unauthorized assistance.
- ✓ ***Homework Assignments:*** *Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.*
- ✓ ***Late Policy:*** *The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.*
- ✓ ***Cheating:*** *Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.*
- ✓ ***Classroom Protocol and Participation Guidelines****: Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.*

Part 4: Course Outline/Schedule

Week	Topics
1	Introduction to Community Nutrition
2	Assessing Community Resources
3	Program Planning for Success
4	Principles of Nutrition Education
5	Marketing Nutrition and Health Promotion
6	Mothers and Infants: Nutrition Assessment, Services and Programs
7	Food Insecurity
8	Children and Adolescents: Nutrition Assessment, Services and Programs
9	Global Food and Nutrition Security: Challenges and Opportunities
10	Healthy Aging: Nutrition Assessment, Services and Programs
11	Public Health Nutrition & the New Nutrition Science
12	The Role of Nutrition in Health Disparities

Week	Topics
13	Introduction to Nutrition Policy
14	Changing Local and County Policies and Environments
15	Continuation
16	Final Exams' week

Part 5: Course Modules

Module 1; Introduction to Community Nutrition	
Key Concepts	Community Nutrition.
Overview	In order for nutrition to impact human health and well-being, it must be applied to human populations through community and population based intervention and education programs. Community nutrition is a modern and comprehensive profession that includes public health nutrition, dietetics/nutrition education, and medical nutrition therapy. Community nutrition deals with a variety of

	food and nutrition issues related to individuals, families, and special groups that have a common link such as place of residence, language, culture, or health issues. This module will introduce students to the field of community nutrition and its role in health and health care. It focuses also on the process and theoretical foundations of nutrition education and the theories, methods and research perspectives applicable to nutrition education. The role of the community nutritionist in determining, delivering and managing community nutrition services is emphasized along with the tools, skills and techniques necessary for developing effective services.
Aim	Enhance students understanding of community nutrition and its role in health care.
Learning Outcomes	At the end of this module students will be able to: 6. Define community nutrition concept **7.** Identify the role of community nutrition in population health.
Units	1. What is community nutrition 2. Public Health and Nutrition 3. Assessing Community Resources 4. Principles of Nutrition Education
Readings	-Boyle, M. and Holben, D. 2013. Community Nutrition in Action: an entrepreneurial approach (6th edition). N.Y.:Thompson/Wadsworth. -http://www.ers.usda.gov/ http://www.jblearning.com/samples/0763747602/47602_ch01_5165.pdf
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes
Module 2; Role of environment, food, nutrition and lifestyle choices in health promotion and disease prevention.	
Key Concepts	Environment, Nutrition, Health, Disease prevention.

Overview	Public health is the art of preventing diseases and promoting health and efficiency through organized community efforts. It was found that increasing nutrition knowledge and the effect of environment on health can reduce medical care costs and improve the quality of life. This module will focus on the role of environment, food and lifestyle choices that may affect and enhance individual's health by preventing diseases related to environmental changes, malnutrition, and bad lifestyle choices.
Aim	The overall aim of this module is to make students understand the relation between environment, nutrition, and health.
Learning Outcomes	At the end of this module students will be able to: 8. Apply knowledge of the role of environment, food and lifestyle choices to develop interventions to affect change and enhance wellness in diverse individuals and groups.
Lessons	1. Marketing Nutrition and Health Promotion 2. Changing Local and County Policies and Environments 3. Mothers and Infants: Nutrition Assessment, Services and Programs 4. Children and Adolescents: Nutrition Assessment, Services and Programs
Readings	-Boyle, M. and Holben, D. 2013. Community Nutrition in Action: an entrepreneurial approach (6th edition). N.Y.:Thompson/Wadsworth. -http://www.ers.usda.gov/ -http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/community-food-security.aspx -http://communityhealth.mc.duke.edu/dynamic/assets/ActionGuide.pdf
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes
Module 3; Fundamentals of Public Policy and Nutrition.	
Key	Public Policy, Nutrition.

Concepts	
Overview	You are what you eat. An old saying that recognizes the critical role that diet has on health. With the goal of improving the nutrition and health of targeted populations local governments have developed and implemented public health policies and programs to prevent nutritional deficiencies by providing nutritious foods, fortifying foods or beverages, and, more recently, limiting the calorie, fat, or sugar content of high-calorie, low-nutrient foods. This module will introduce to students the public policies that used by dietetics to reduce individuals health problems related to their nutrition.
Aim	Enhance students knowledge about public polices used by nutritionists.
Learning Outcomes	At the end of this module students will be able to Explain the impact of a public policy position on dietetics practice.
Units	1. Introduction to Nutrition Policy. 2. Legislative and Regulatory Basis of Dietetics Practice.
Readings	-Boyle, M. and Holben, D. 2013. Community Nutrition in Action: an entrepreneurial approach (6th edition). N.Y.:Thompson/Wadsworth. -http://www.ers.usda.gov/ -http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/community-food-security.aspx -http://communityhealth.mc.duke.edu/dynamic/assets/ActionGuide.pdf
Activities	Participation in class room, assignments and homework. Reading, group discussion, Giving examples, presentations, quizzes
Module 4; Health Care Systems.	
Key Concepts	Health, System.
Overview	Health care systems' goals are good health for the citizens,

	responsiveness to the expectations of the population, and fair means of funding operations. Progress towards them depends on how systems carry out four vital functions: provision of health care services, resource generation, financing, and stewardship. Other dimensions for the evaluation of health systems include quality, efficiency, acceptability, and health equity. This module will enhance students understanding of the impact of health care systems and policies on food nutrition services.
Aim	Enhance students understanding of the health care systems.
Learning Outcomes	At the end of this module students will be able to: **9.** Explain the impact of health care policy and administration, different health care delivery systems and current reimbursement issues, policies and regulations on food and nutrition services.
Units	1. Public Health Nutrition & the New Nutrition Science 2. The Role of Nutrition in Health Disparities
Readings	-Boyle, M. and Holben, D. 2013. Community Nutrition in Action: an entrepreneurial approach (6th edition). N.Y.:Thompson/Wadsworth. -http://www.ers.usda.gov/ -http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/community-food-security.aspx -http://communityhealth.mc.duke.edu/dynamic/assets/ActionGuide.pdf
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes

Jerash University

Course Syllabus

College: Agriculture
Department: Food and Nutrition Science

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 607475
Course Name: Community Nutrition
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:

✓ **Course Description:**

This course will examine the role of nutrition in promoting, maintaining and improving health in the community. It investigates traditional aspects of the emerging health delivery system, as well as entrepreneurial programs in wellness. Students will study the financial, legislative, political, sociological, and scientific aspects of public and community health.
The overall objective of this course is providing an introduction to the practice of public health nutrition, discussion of significant public health nutrition problems, nutrition polices and physical activities, and nutrition programs available to the community.

- ✓ **Course Learning Objectives:**
  6. Understanding the responsibilities of the community nutritionist
  7. Nutrition program planning and evaluation strategies
  8. Methods of nutritional assessment and intervention
  9. Identification of nutrition programs and policies for various stages of the life cycle
  10. Solving nutritional and health problems in a community setting

- ✓ **Expected Course Outcomes:**
  4. Develop interventions to affect change and enhance wellness in diverse individual and groups.
  5. Explain the impact of a public policy position on dietetics practice.
  6. Explain the impact of health care policy and different health care delivery systems on food and nutrition services.

- ✓ **Course Resources:** (List the required course texts, course material, recommended websites, and other readings)
  10. Reading material consists of handouts/internet websites.

11. Boyle, M. and Holben, D. 2013. Community Nutrition in Action: an entrepreneurial approach (6th edition). N.Y.:Thompson/Wadsworth.
12. http://www.ers.usda.gov/
13. http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/community-food-security.aspx
14. http://communityhealth.mc.duke.edu/dynamic/assets/ActionGuide.pdf

Part 3: Assignments, Course policies, and Grading Policy

- ✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*
- ✓ ***Grade Components:***

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

- ✓ **Grading Policy:** In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

- ✓ **Course Policies:** All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to neither do their own work and neither gives nor receive unauthorized assistance.

- ✓ ***Homework Assignments:*** *Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.*
- ✓ ***Late Policy:*** *The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.*
- ✓ ***Cheating:*** *Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.*
- ✓ ***Classroom Protocol and Participation Guidelines****: Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.*

Part 4: Course Outline/Schedule

Week	Topics
1	Introduction to Community Nutrition
2	Assessing Community Resources
3	Program Planning for Success
4	Principles of Nutrition Education
5	Marketing Nutrition and Health Promotion
6	Mothers and Infants: Nutrition Assessment, Services and Programs
7	Food Insecurity
8	Children and Adolescents: Nutrition Assessment, Services and Programs
9	Global Food and Nutrition Security: Challenges and Opportunities
10	Healthy Aging: Nutrition Assessment, Services and Programs
11	Public Health Nutrition & the New Nutrition Science
12	The Role of Nutrition in Health Disparities
13	Introduction to Nutrition Policy
14	Changing Local and County Policies and Environments
15	Continuation

Week	Topics
16	Final Exams' week

Part 5: Course Modules

Module 1; Introduction to Community Nutrition	
Key Concepts	Community Nutrition.
Overview	In order for nutrition to impact human health and well-being, it must be applied to human populations through community and population based intervention and education programs. Community nutrition is a modern and comprehensive profession that includes public health nutrition, dietetics/nutrition education, and medical nutrition therapy. Community nutrition deals with a variety of food and nutrition issues related to individuals, families, and special groups that have a common link such as place of residence, language, culture, or health issues.

	This module will introduce students to the field of community nutrition and its role in health and health care. It focuses also on the process and theoretical foundations of nutrition education and the theories, methods and research perspectives applicable to nutrition education. The role of the community nutritionist in determining, delivering and managing community nutrition services is emphasized along with the tools, skills and techniques necessary for developing effective services.
Aim	Enhance students understanding of community nutrition and its role in health care.
Learning Outcomes	At the end of this module students will be able to: 15. Define community nutrition concept **16.** Identify the role of community nutrition in population health.
Units	1. What is community nutrition 2. Public Health and Nutrition 3. Assessing Community Resources 4. Principles of Nutrition Education
Readings	-Boyle, M. and Holben, D. 2013. Community Nutrition in Action: an entrepreneurial approach (6th edition). N.Y.:Thompson/Wadsworth. -http://www.ers.usda.gov/ http://www.jblearning.com/samples/0763747602/47602_ch01_5165.pdf
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes
Module 2; Role of environment, food, nutrition and lifestyle choices in health promotion and disease prevention.	
Key Concepts	Environment, Nutrition, Health, Disease prevention.
Overview	Public health is the art of preventing diseases and promoting health and efficiency through organized community efforts. It was found that increasing nutrition knowledge and the effect of environment on health

	can reduce medical care costs and improve the quality of life. This module will focus on the role of environment, food and lifestyle choices that may affect and enhance individual's health by preventing diseases related to environmental changes, malnutrition, and bad lifestyle choices.
Aim	The overall aim of this module is to make students understand the relation between environment, nutrition, and health.
Learning Outcomes	At the end of this module students will be able to: 17. Apply knowledge of the role of environment, food and lifestyle choices to develop interventions to affect change and enhance wellness in diverse individuals and groups.
Lessons	1. Marketing Nutrition and Health Promotion 2. Changing Local and County Policies and Environments 3. Mothers and Infants: Nutrition Assessment, Services and Programs 4. Children and Adolescents: Nutrition Assessment, Services and Programs
Readings	-Boyle, M. and Holben, D. 2013. Community Nutrition in Action: an entrepreneurial approach (6th edition). N.Y.:Thompson/Wadsworth. -http://www.ers.usda.gov/ -http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/community-food-security.aspx -http://communityhealth.mc.duke.edu/dynamic/assets/ActionGuide.pdf
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes
Module 3; Fundamentals of Public Policy and Nutrition.	
Key Concepts	Public Policy, Nutrition.
Overview	You are what you eat. An old saying that recognizes the critical role that diet has on health. With the goal of improving the nutrition and health of

	targeted populations local governments have developed and implemented public health policies and programs to prevent nutritional deficiencies by providing nutritious foods, fortifying foods or beverages, and, more recently, limiting the calorie, fat, or sugar content of high-calorie, low-nutrient foods. This module will introduce to students the public policies that used by dietetics to reduce individuals health problems related to their nutrition.
Aim	Enhance students knowledge about public polices used by nutritionists.
Learning Outcomes	At the end of this module students will be able to Explain the impact of a public policy position on dietetics practice.
Units	1. Introduction to Nutrition Policy. 2. Legislative and Regulatory Basis of Dietetics Practice.
Readings	-Boyle, M. and Holben, D. 2013. Community Nutrition in Action: an entrepreneurial approach (6th edition). N.Y.:Thompson/Wadsworth. -http://www.ers.usda.gov/ -http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/community-food-security.aspx -http://communityhealth.mc.duke.edu/dynamic/assets/ActionGuide.pdf
Activities	Participation in class room, assignments and homework. Reading, group discussion, Giving examples, presentations, quizzes
Module 4; Health Care Systems.	
Key Concepts	Health, System.
Overview	Health care systems' goals are good health for the citizens, responsiveness to the expectations of the population, and fair means of funding operations. Progress towards them depends on how systems carry out four vital functions: provision of health care services, resource

	generation, financing, and stewardship. Other dimensions for the evaluation of health systems include quality, efficiency, acceptability, and health equity. This module will enhance students understanding of the impact of health care systems and policies on food nutrition services.
Aim	Enhance students understanding of the health care systems.
Learning Outcomes	At the end of this module students will be able to: **18.** Explain the impact of health care policy and administration, different health care delivery systems and current reimbursement issues, policies and regulations on food and nutrition services.
Units	1. Public Health Nutrition & the New Nutrition Science 2. The Role of Nutrition in Health Disparities
Readings	-Boyle, M. and Holben, D. 2013. Community Nutrition in Action: an entrepreneurial approach (6th edition). N.Y.:Thompson/Wadsworth. -http://www.ers.usda.gov/ -http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/community-food-security.aspx -http://communityhealth.mc.duke.edu/dynamic/assets/ActionGuide.pdf
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes

College: Economics and Administrative Science
Department: Banking and Finance

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 206343
Course Name: Economic Development
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:

✓ **Course Description:**

One out of five people on this planet lives on less than $1 per day and half the world lives on less than $2 per day. The intention of this course is to explore the causes and correlates of global poverty, and discuss policies used to address it. After a brief introduction to the concept of development, this course will develop the tools that will be used by student, including measurements of poverty and inequality, and a basic understanding of regression analysis.

The global distribution of income and the current debate regarding the sources of this distribution ("institutions" versus "geography") will then be briefly discussed as well as some of the important correlates of poverty – corruption and civil conflict. The next section of the course will focus on the impact of nutrition and education on household welfare, as well as programs intended help increase health and schooling outcomes, the relationship between population growth and economic development, as well as the related topics of environment, climate change effect, and agriculture.
The discussion of agriculture leads naturally into the question of rural to urban and international migration. The last section of the course considers the use of land reform and microfinance as pathways out of poverty.

✓ **Course Learning Objectives:**

- To explain long-term economic growth in developing countries.
- Understand specific topics such as population growth, income distribution, environmental issues and project management as well as policy issues of international cooperation and development.
- Provide a solid base of knowledge on economic theory and analytical skills that will enable students to become experts in economic and social development policies.

✓ **Expected Course Outcomes:**

7. Analyze the local economy and value chains in which local enterprise agglomerations and clusters are inserted
8. Analyze policies and develop instruments that support local businesses
9. The abilities to critically analyze and reform policies, and working collaboratively with international organizations on developmental issues.

✓ **Course Resources:**

19. Reading material consists of handouts/internet websites.
20. Putterman, Louis and David Weil "*Post-1500 Population Flows and the Long Run Determinants* of Economic Growth and Inequality", Quarterly Journal of Economics 125:4, November 2010
21. Understanding Poverty, A. Banerjee, R. Benabou, and D. Mookherjee, editors, Oxford University Press: March 2006.
22. The Concept of Development" in Handbook of Development Economics vol. 1
23. Ray, Debraj. Development Economics. Princeton University Press, 1998.

24. Fullerton and Stavins (1998) "How Economists See the Environment"

Part 3: Assignments, Course policies, and Grading Policy

- ✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*
- ✓ ***Grade Components:***

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

- ✓ **Grading Policy:** In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

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- ✓ ***Homework Assignments:*** *Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.*
- ✓ ***Late Policy:*** *The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.*
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Part 4: Course Outline/Schedule

Week	Topics
1	What is development?
2	Tools: Measuring poverty and inequality Tools: Regression analysis
3	Institutions, geography, and the global distribution of income
4	Barriers to growth I: corruption Barriers to growth II: civil wars
5	Human capital: health
6	Human capital: education
7	Conditional Cash Transfer Programs
8	Population and development
9	Environment and development
10	Agriculture in economic development
11	Migration - rural-urban and international
12	Land and property rights

Week	Topics
13	Microfinance
14	Foreign aid and the role of international development agencies
15	Continuation
16	Final Exams' week

Part 5: Course Modules

Module 1; Introduction: What is development?	
Key Concepts	Development, Poverty, Growth, Income
Overview	Development economics is a branch of economics which deals with economic aspects of the development process in low-income countries. Its focus is not only on methods of promoting economic development, economic growth and structural change but also on improving the potential for the mass of the population, for example, through health and education and workplace conditions, whether through public or private channels. Development economics involves the creation of theories and methods that aid in the determination of policies and practices and can be implemented at either the domestic or international level. Poverty refers to the deprivation of basic human needs, which commonly includes food, water, sanitation, clothing, shelter, health care and education. This module will introduce students to economic development by focusing on the history of development, poverty, and distribution of income.
Aim	Enhance student understanding of economic development.

Learning Outcomes	At the end of this module, students will be able to: 25. Define development economics. 26. Identify the causes of poverty. 27. Apply regression analysis.
Units	1. History, Growth and Development 2. Measuring poverty and inequality 3. Regression analysis 4. Institutions, geography, and the global distribution of income
Readings	- Putterman, Louis and David Weil "*Post-1500 Population Flows and the Long Run Determinants* of Economic Growth and Inequality", Quarterly Journal of Economics 125:4, November 2010 - Understanding Poverty, A. Banerjee, R. Benabou, and D. Mookherjee, editors, Oxford University Press: March 2006. - The Concept of Development" in Handbook of Development Economics vol. 1 - Ray, Debraj. Development Economics. Princeton University Press, 1998.
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes
Module 2; Human Capital: Health, and Education	
Key Concepts	Human Capital, Health, Education.
Overview	Human capital is a collective economic view of the human being acting within economies, which is an attempt to capture the social, biological, cultural and psychological complexity as they interact in explicit and/or economic transactions. Many theories explicitly connect investment in human capital development to education, and the role of human capital in economic development, health and reduces diseases, productivity growth, and innovation has frequently been cited as a justification for

	government subsidies for education, health, and job skills training. This module will focus on human capital concept and its relation with health and education.
Aim	Enhance student knowledge about human capital concept.
Learning Outcomes	At the end of this module, students will be able to: 28. Define human capital. 29. Identify the relation between education and health with human capital.
Units	1. Health and Nutrition: Poverty Traps 2. Providing health services and medicines in developing countries 3. Health externalities and randomized experiments 4. Educational Interventions 5. Child Labor
Readings	- Putterman, Louis and David Weil "*Post-1500 Population Flows and the Long Run Determinants* of Economic Growth and Inequality", Quarterly Journal of Economics 125:4, November 2010 - The Concept of Development" in Handbook of Development Economics vol. 1 - Ray, Debraj. Development Economics. Princeton University Press, 1998.
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes
Module 3; Effect of Population and Environment on Development	
Key Concepts	Population, Environment.
Overview	Population dynamics, including growth rates, age structure, fertility and mortality, migration and more, influence every aspect of human, social and economic development. Governments need to be able to gather

	information about, track and analyze population trends in order to create and manage sound policies and generate the political will to appropriately address both current and future needs. "The 'environment' is where we live; and development is what we all do in attempting to improve our lot within that abode. The two are inseparable." *Our Common Future.* This module analyses the evolution of such ideas as well as global trends in relation to environment, climate change, and socio economic development, and the relation of growing population and development.
Aim	Enhance student understanding of the relation between population, environment and development.
Learning Outcomes	At the end of this module, students will be able to: 30. Identify the relation between population, environment and development.
Units	1. Population and development 2. Environment and development
Readings	- Putterman, Louis and David Weil "*Post-1500 Population Flows and the Long Run Determinants* of Economic Growth and Inequality", Quarterly Journal of Economics 125:4, November 2010 - The Concept of Development" in Handbook of Development Economics vol. 1 - Ray, Debraj. Development Economics. Princeton University Press, 1998. - Fullerton and Stavins (1998) "How Economists See the Environment
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes
Module 4; Agriculture , Land Property in Economic Development	

Key Concepts	Agriculture, Land, Economic.
Overview	Thinking on development has long held that agricultural growth is an important step toward economic development and transformation. The majority of the region population lives in rural areas, where poverty and deprivation are most severe. Since almost all rural households depend directly or indirectly on agriculture, and given the large contribution of the sector to the overall economy, one might expect agriculture to be a key component of growth and development. On the other hand, the ability farmers and others to buy a land and have properties may also affect development. Secure and predictable access to land as a productive resource is a key to the livelihoods of millions of farmers around the world. Secure land tenure enables farmers to invest in long-term improvements to their farms and soils in the expectation that they will reap the benefits of those investments without fear that their land be taken away without a reason. Formal and informal land rights are therefore seen as key to improving the conditions of the poor in developing countries in terms of economic growth, agricultural production, food security, natural resource management, gender-related inequalities, conflict management and local governance processes more generally. This module will focus on the role of agriculture and land property in the development of economics.
Aim	Enhance student knowledge about economic development and its relation with agriculture and land.
Learning Outcomes	At the end of this module, students will be able to: 31. Discuss the relation between agriculture, land property and development.
Units	1. Agriculture in economic development 2. Migration - rural-urban and international

	3. Land and property rights 4. Microfinance
Readings	- Putterman, Louis and David Weil "*Post-1500 Population Flows and the Long Run Determinants* of Economic Growth and Inequality", Quarterly Journal of Economics 125:4, November 2010 - The Concept of Development" in Handbook of Development Economics vol. 1 - Ray, Debraj. Development Economics. Princeton University Press, 1998. http://www.ifpri.org/sites/default/files/pubs/pubs/abstract/153/rr153.pdf
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes

Jerash University

Course Syllabus

College: Agriculture
Department: Plant Production and Protection

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 601432
Course Name: Economic Fruit Crops in Jordan
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:

✓ **Course Description:**

Agriculture in Jordan contributed substantially to the economy at the time of Jordan's independence. This course includes an introduction to theoretical and practical aspects in plant growth and development on selected fruit crops that grown in Jordan, with emphasis on scientific name, origin, genetic diversity, and breeding. Discuss the origin and significance of genetic diversity for cultivars and rootstocks.

✓ **Course Learning Objectives:**

1. Environmental factors that affect crop adaptation; growth requirements, morphological, physiological and adaptive traits, plant propagation, dormancy
2. Critical management practices for fruit crop improvement and production

3. Relation between economics and planting fruit crops.

✓ **Expected Course Outcomes:**

10. Students will develop fundamental knowledge on selected Mediterranean fruit crops
11. Become familiar with critical management practices for Mediterranean fruit crop improvement and production

✓ **Course Resources:**

32. Reading material consists of handouts/internet websites.
33. J. N. Landis. 2002. Fruit Crop Ecology and Management. Michigan State University Extension: Michigan Agricultural Experiment Station.
34. M. Rieger. 2006. Introduction to Fruit Crops.
35. http://orchard.uvm.edu/uvmapple/hort/AppleHortBasics/Readings/msue_FruitCropEcology.pdf
36. http://www.fruit-crops.com/chapter1/

Part 3: Assignments, Course policies, and Grading Policy

✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

✓ ***Grade Components:***

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

✓ **Grading Policy:** In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by

the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

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Part 4: Course Outline/Schedule

Week	Topics
1	Introduction to Fruit Crops Agriculture
2	The Agricultural Ecosystem
3	Continuation
4	Socio- economic Baseline
5	Continuation
6	Fresh Fruit Production

Week	Topics
7	Continuation
8	Understanding the Regional Potential of Fruit Production
9	Continuation
10	Estimating the Regional Economic Impacts
11	Continuation
12	Environmental Effects on Insects and Diseases
13	Continuation
14	Production and Marketing Strategy
15	Continuation
16	Final Exams' week

Part 5: Course Modules

Module 1; Introduction: An Ecological Approach to Growing Fruits	
Key Concepts	Ecology, Fruit.
Overview	Biological and social factors are driving the need for new farming practices. Fruit crop ecology is the study of the interactions among the many biological, environmental and management factors that make up and influence fruit production. This module explores growing fruit within a complex web that connects soil, plants, animals, humans, landscapes and the atmosphere. An ecological approach to fruit production recognizes that these factors interact in a changing environment and that it is impossible to change one aspect of a farming system without affecting others. Growers and consumers have benefited greatly from technological advances in fruit production that have increased yields and

	reduced labor costs. There have also been some unexpected environmental and social consequences, such as pesticide resistance, loss of biodiversity; and potential water pollution. Growers and scientists are looking for better ways to work within a healthy system of soils, plants and animals.
Aim	Enhance students understanding of fruit crop farming and its relation ecology.
Learning Outcomes	At the end of this module students will be able to: 37. Define some concepts, like ecology, and fruit crop farming. 38. Understand the relationship between ecology and fruit crop agriculture.
Units	1. Introduction to Fruit Crop Agriculture. 2. Origin, History of Cultivation. 3. The Agricultural Ecosystem. 4. Fresh Fruit Production. 5. Environmental Effects on Insects and Diseases.
Readings	-J. N. Landis. 2002. Fruit Crop Ecology and Management. Michigan State University Extension: Michigan Agricultural Experiment Station. -M. Rieger. 2006. Introduction to Fruit Crops. http://orchard.uvm.edu/uvmapple/hort/AppleHortBasics/Readings/msue_FruitCropEcology.pdf -http://www.fruit-crops.com/chapter1/
Activities	Participation in class room, assignments and homework. Reading, group discussion, Giving examples, presentations, quizzes
Module 2; Economy and Fruit Crops Agriculture	
Key Concepts	Economy, Fruit, Agriculture.
Overview	Agriculture in Jordan contributed substantially to the economy at the

	time of Jordan's independence. Although the agricultural sector's share of Gross national product (GNP) declined in comparison with other sectors of the economy, farming remained economically important and production grew in absolute terms. In the more fertile Jordan River valley, fruits including, tomatoes, melons, bananas and citrus crops often were produced in surplus amounts. Although the country's ultimate agricultural potential was small, economic factors apparently limited production more than environmental constraints It is important to understand the region's overall demographic changes and the economic activity patterns that have evolved over the years. This region is characterized by population declines in its non-metropolitan portions, slow job growth, and comparatively low earnings per job. Economic impacts are estimated using an input-output model of the regional economy. The modeling system accounts for expected transactions among all industries within a region. When a type of industrial activity expands, so do its demands for inputs. When area suppliers increase their sales, they in turn demand more regionally supplied inputs, and so on. This is called a multiplier effect. If we introduce more fruit production, we will introduce more demand for inputs. We must offset those gains by losses to existing agriculture as cropland amounts are considered fixed.
Aim	Enhance students understanding of the relationship between economics and agriculture.
Learning Outcomes	At the end of this module students will be able to: 39. Recognize the effect of agriculture on economy.
Units	1. Socio- economic Baseline 2. Estimating the Regional Economic Impacts. 3. Production and Marketing Strategy.

Readings	-J. N. Landis. 2002. Fruit Crop Ecology and Management. Michigan State University Extension: Michigan Agricultural Experiment Station. -M. Rieger. 2006. Introduction to Fruit Crops. http://orchard.uvm.edu/uvmapple/hort/AppleHortBasics/Readings/msue_FruitCropEcology.pdf -http://www.fruit-crops.com/chapter1/
Activities	Participation in class room, assignments and homework. Reading, group discussion, Giving examples, presentations, quizzes

Jerash University

Course Syllabus

College: Engineering
Department: Civil Engineering

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)

Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 901408
Course Name: Environmental Engineering
Class Hours: (Times & Days)
Classroom:(Number & Building)
Prerequisites:

✓ **Course Description:**

Students in the class will be introduced to topics relevant to environmental engineering. Topics to be covered in this class include characterization of pollution in air, water, and solid wastes, environmental regulations, and engineering approaches for treatment and remediation of the pollution to meet the regulatory requirements. The students will learn to apply mass balance principles and reaction kinetics in engineering calculations and design of treatment systems. Contemporary issues such as water-energy nexus, climate changes, and emerging contaminants (e.g., engineered nano material, pharmaceuticals and personal care products) and potential solutions for addressing these issues will also be discussed. In laboratory sessions, the students will conduct experiments, collect and analyze data, and interpret the results.

✓ **Course Learning Objectives:**

- Learn risk-based assessment for human health.
- Describe potential exposure routes of pollutants to human.
- Know how to determine the amount of product formed and/or reactants used based on stoichiometry.
- Explain the chemical processes that govern the formation and destruction or removal of air pollutants, principally ozone and particulate matter.
- Understand basic laboratory and field techniques in the measurement of air pollutants.
- Demonstrate an understanding of water standards and regulations and how they relate to international controls
- Understand the importance of water in solving local, regional and international community problems.

✓ Expected Course Outcomes:

- To be familiar with environmental laws, pollution, and engineering approaches to mitigate the pollution.
- Explain current air pollution research in the context of the history of air pollution science.
- Explain the relationships between emissions of different air pollutants from different sources, their atmospheric concentrations, and the impacts that they ultimately cause.
- Explain the factors that influence the transport of pollutants around the world.
- Conduct experiments; collect and analyze data; and interpret the results.
- Understand the public health consequences of water supply and use.
- Evaluate the effectiveness of various types of management practice related to treatment of drinking water.
-

✓ Course Resources:

Text book;

- Peirce. J, Vesilind. A, 2003, Environmental Engineering, 4th Edition, Elsevier- Science Print, USA.

Supplemental readings;

- Danny D Reible. (1998). Fundamentals of environmental engineering.Library of Congress, USA.
- Daniel J. Jacob, Introduction to Atmospheric Chemistry, 1999, Princeton University Press. This book is available for free on the web: http://acmg.seas.harvard.edu/people/faculty/djj/book/index.html
- International *Journal* of *Environmental Engineering*
- *Journal* of *Environmental Engineering* and Science
- *Journal* of *Environmental* Chemical *Engineering*
- *Environmental Engineering* and Management *Journal*
- *The International Journal of Energy and Environmental Engineering.*

Part 3: Assignments, Course policies, and Grading Policy

- ✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

- ✓ ***Grade Components:***

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

- ✓ **Grading Policy:** In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

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- ✓ ***Cheating:*** *Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.*
- ✓ ***Classroom Protocol and Participation Guidelines:*** *Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.*

Part 4: Course Outline/Schedule

Week	Topic
1	Course Introduction
2	Mass Balance
3	Mass Balance
4	Pollution Balance
5	Energy Balance
6	Air Pollution
7	Air Pollution Control
8	Air Quality
9	Assessment of Risk
10	Risk Perception
11	Ecosystem Risk Assessment
12	**Water Treatment – Settlinf-**

Week	Topic
13	Filtration
14	**Treatment** Processes – System Layout-
15	Revision and students' presentations
16	Final Exam

Part 5: Course Modules

Module 1; Mass Balance	
Key Concepts	Conservation Law, Energy Balance, Chemical Reactors,Physical Systems
Overview	A mass balance, also called a material balance, is an application of conservation of mass to the analysis of physical systems. By accounting for material entering and leaving a system, mass flows can be identified which might have been unknown, or difficult to measure without this technique. The exact conservation law used in the analysis of the system depends on the context of the problem, but all revolve around mass conservation, i.e. that matter cannot disappear or be created spontaneously. Therefore, mass balances are used widely in engineering and environmental analyses. For example, mass balance theory is used to design chemical reactors, to analyze alternative processes to produce chemicals, as well as to model pollution dispersion and other processes of physical systems. Closely related and complementary analysis techniques include the population balance, energy balance and the somewhat more complex entropy balance. These techniques are required for thorough design and analysis of systems such

	as the refrigeration cycle.
Aim	- Identify engineering economic problems that commonly are found in the business world.
Learning Outcomes	- Apply mass balance and reaction kinetics in designing treatment and pollution control systems.
Units	- Basic concepts - Steady- state materials balance - Dynamic balance on a stirred system - Balance on unstirred system
Readings	- Danny D Reible. (1998). Fundamentals of environmental engineering. Library of Congress, USA
Activities	Lab experiments, Field trip, Drill and practice
Module 2; Air Pollution	
Key Concepts	Pollution , Air Quality , Air Laws, Acid Rain
Overview	Air pollution has significant effects on human health and the environment, through interrelated problems of ozone and particulate matter air pollution, acid rain, visibility degradation, mercury ,stratospheric ozone depletion, and climate change. Significant strides have been made in the past few decades to improve our understanding of the sources, chemical transformation, transport ,deposition, and impacts of different pollutants. We now understand that many air pollutants are linked together through complex chemical interdependencies.
Aim	- Explain the chemical processes that govern the formation and destruction or removal of air pollutants, principally

	ozone and particulate matter. - Understand basic laboratory and field techniques in the measurement of air pollutants.
Learning Outcomes	By the end of this course, students will be able to: - Explain current air pollution research in the context of the history of air pollution science. - Explain the relationships between emissions of different air pollutants from different sources, their atmospheric concentrations, and the impacts that they ultimately cause. - Explain the factors that influence the transport of pollutants around the world.
Units	- Control of gaseous pollutants - Control of climate change - Resources of air pollution - air pollution effects - air quality and common laws
Readings	- Daniel J. Jacob, Introduction to Atmospheric Chemistry, 1999, Princeton University Press. This book is available for free on the web: http://acmg.seas.harvard.edu/people/faculty/djj/book/index.html - Peirce. J, Vesilind. A, 2003, Environmental Engineering, 4th Edition, Elsevier- Science Print, USA. Chapter 18,19,20,21.
Activities	Assignments and instructional visits to real sites
Module 3; Risk Assessment	
Key Concepts	Toxicology, Fault Trees, Environmental Assessment, Uncertainty
Overview	In this module we begin by examining the definition of risk in

	the context of engineering, and compare experts' and laymen's approaches to risk assessment. We look at exposure measurement, toxicology, and epidemiology as ways to assess environmental risk in terms of effects on human health and safety; difficulties inherent to such analyses (e.g., cumulative and synergistic effects, uncertainty) are addressed. We also cover tools used to analyze technology and process-related risks, such as failure mode analysis and fault trees.
Aim	- Learn risk-based assessment for human health. - Be able to describe potential exposure routes of pollutants to human.
Learning Outcomes	- Conduct experiments; collect and analyze data; and interpret the results. - Demonstrate an understanding of the application of the risk assessment approach by participation in class discussion and an oral presentation. - Understand how existing toxicological and epidemiologic data can be of use in a risk assessment.
Units	- Use of risk analysis in environmental assessment - Socioeconomic impact assessment - Dose- response evaluation - Probability - Expression of risk - Exposure and latency
Readings	- Peirce. J, Vesilind. A, 2003, Environmental Engineering, 4th Edition, Elsevier- Science Print, USA. Chapter 1,2. - Selected articles from International Journal of Environmental Engineering

Activities	Quiz, Web search, Student Presentation
Module 4; Water Treatment	
Key Concepts	Treatment Process, Overflow Rates
Overview	Water is coming under increasing pressure from demographic and climatic changes. Treatment processes play a key role in delivering safe, reliable supplies of water to households, industry and agriculture and in safeguarding the quality of water in rivers, lakes, aquifers and around coastal areas. Well educated, skilled and experienced graduates are required to operate and manage vital water and wastewater treatment services. The demand for such graduates is already high and will only increase over coming years as environmental standards for water quality increase, and pressures on our water supplies continue to grow. The course gives the technological backgrounds of treatment processes applied for production of drinking water. The treatment processes are demonstrated with laboratory experiments. Study goals: Knowledge of technological basics and design parameters of drinking water treatment processes
Aim	- Demonstrate an understanding of water standards and regulations and how they relate to international controls - Understand the importance of water in solving local, regional and international community problems
Learning Outcomes	By the end of this module, students should be able to: - Understand the public health consequences of water supply and use. - Evaluate the effectiveness of various types of management practice related to treatment of drinking

	water. - Describe the fundamentals of water use, treatment and distribution.
Units	- Coagulation and Flocculation - Filtration - Groundwater Supplies - Surface Water Supplies - Water Transmission
Readings	- Peirce. J, Vesilind. A, 2003, Environmental Engineering, 4th Edition, Elsevier- Science Print, USA. Chapter 1,2. - Selected articles from - Journal of Environmental Engineering and Science
Activities	- Essay, Discussion, Experiment

Jerash University

Course Syllabus

College: Law
Department: Law

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours:
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 501435
Course Name: Environmental Law
Class Hours:
Classroom:
Prerequisites:

✓ **Course Description:**

This course introduces students to international environmental law and considers how international law may be used to facilitate environmental protection. The first part of the course commences with an overview of the international legal system in the context of environmental protection. It, then, discusses the history, development, sources and principles of international environmental law and reviews the role of the UN and other international organizations in the context of environmental protection. Next, it reviews key issues (atmospheric protection, climate change, transboundary water, biodiversity and international forest law) to analyze the creation, implementation and effectiveness of international environmental law.

The second part of the course analyses particularly complex international environmental issues. Using case studies which may include hazardous waste, nuclear energy and biotechnology, it explores damage, liability and dispute settlement in an international environmental context, discusses the role of international litigation, and analyses the relationship between environmental protection and international trade law.

Case Study: The course culminates in a participatory case study, in which you will integrate and apply what you've learned to an actual resource management dilemma.

✓ **Course Learning Objectives:**

- Understand the basics of administrative process in environmental law;
- Overview of major statutes relevant to marine, climate change, biodiversity resource management;
- Learn how to use online databases to retrieve legal materials;
- Become familiar with the structure and function of judicial opinions;
- Gain a deeper understanding of the science-law-policy interface;
- Lay a foundation for further legal studies.

✓ **Expected Course Outcomes:**

12. Fitzmaurice, Malgosia and David Ong and Panos Merkouris. Research Handbook on International Environmental Law. Edward Elgar, 2010

13. to acquire an understanding of the legal, institutional and policy framework which structures and regulates decision-making concerning the environment, using climate change as a case study;

14. to develop a knowledge of the legal concepts, procedures and techniques which have evolved - to subject existing procedures and techniques to critical analysis;

15. To help decision makers and legislators find drastic solutions that mitigate and slow down the effects of climate change.

✓ **Course Resources:**

1. S. Bell, D. McGillivray and O. Pederson, Environmental Law (OUP, 8th ed, 2013).
2. N. Gunningham, "Environmental Law, Regulation and Governance: Shifting Architectures" (2009) 21(2) Journal of Environmental Law 179
3. D. Cole, "Climate Change and Collective Action" (2009) 1 Current Legal Problems 229-264
4. N. Kubasek and G. Silverman, Environmental Law (5^{th} ED).
5. Findley and Farber, Environmental Law in a Nutshell.
6. Houck, O. (2003). Tales from a Troubled Marriage: Science and Law in Environmental Policy. Science 302: 1926-1929.

Available at: http://www.sciencemag.org/cgi/content/full/302/5652/1926
7. *National Environment Strategy for Jordan: A Resource Book of Information and Guidelines for Action.* Available at: http://www.joriew.eu/uploads/private/joriew_org_jordan_national_environment_strategy.pdf
8. Environmental Protection Law No. 52 of 2006. Available at: http://ocid.nacse.org/rewab/docs/Environmental_Protection_Law_No_52_of_2006_en.pdf
9. http://www.law.georgetown.edu/library/research/guides/InternationalEnvironmentalLaw.cfm

Part 3: Assignments, Course policies, and Grading Policy

- ✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*
- ✓ ***Grade Components:***

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

- ✓ **Grading Policy:** In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

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Part 4: Course Outline/Schedule

Week	Topics
1	Course Introduction: What Is Environmental Law?
2	History and Development of International Environmental Law (IEL)
3	Sources and Principles of IEL
4	NEPA: Judicial Interpretations and Effectiveness
5	Continuation First Exam Due
6	Environmental Impact Statement
7	Continuation
8	Atmospheric Protection
9	Climate Change
10	Water Quality Control
11	International Environmental Litigation Second Exam Due
12	Environmental Law and Policy in Jordan
13	Biodiversity
14	Case Study Presentations
15	Case Study Presentations
16	Evaluation and Assessment Final Exam Due

Part 5: Course Modules

Module 1; What is Environmental Law?	
Key Concepts	Legal doctrines, regulations, environmental lawyer, economics
Overview	Environmental law is a complex area of law that goes far deeper than the protection of the environment. Those who practice environmental law must master more than the relevant legal doctrines, federal and state statutes, regulations, and administrative law principles. They must also be able to analyze public policy, understand economics, science, and the basis behind environmental protection. They must also sift through the bureaucratic and political aspects of environmental law and policy while attempting to litigate for their clients. A successful environmental lawyer can solve environmental problems and see the wider social, economic, and political implications that underlie the environmental law.
Aim	This module aims to teach students to regulate the interaction of humanity and the natural environment, toward the purpose of reducing the impacts of human activity through the power the environmental law can give and allow.
Learning Outcomes	By the end of this module, students will be able to: - increase public concern over the impact of industrial activity on natural resources and human health; - Realize that violations of environmental laws are generally civil offenses, resulting in monetary

	penalties and, perhaps, civil sanctions such as injunction; - Recognize that a sustainable society should be created where environmental loads by human activities are minimized, and this can best be done through enforcing the environmental law.
Unit	International Environmental Law as a System of International Law
Readings	Research Handbook on International Environmental Law
Activities	Reading, analysis, discussion, presentations
Module 2; International Environmental Law	
Key Concepts	International law, environmental law, ozone layer, rain forests
Overview	Growth of international environmental law as a separate area of public international law began in the 1970s with the Stockholm Conference on the Environment in 1972. Since then interest has steadily increased and it is one of the fastest growing areas of international law. Current issues of international concern covered by environmental law include ozone layer depletion and global warming, desertification, destruction of tropical rain forests, marine plastics pollution from ships, international trade in endangered species (i.e. ivory trade), shipment of hazardous wastes to Third World countries, deforestation of Brazil and the Philippines, protection of wetlands, oil spills, transboundary nuclear air pollution (i.e. Chernobyl), dumping of hazardous wastes, groundwater depletion, international trade in pesticides, and acid rain.

	Environmental law is also cutting across other areas of international law, such as commercial/business law, trade, and human rights.
Aim	The aim of this module is to learn about the history and development of international environmental laws and to look into treaties, conventions, agreements and resolutions set by global agencies in order to resolve problems of the environment.
Learning Outcomes	By the end of the module, students will be able to: - Learn about the different issues and problems that concern the environment; - Revise the rules that govern and regulates the use of the environment and constitutionalize that; - Investigate the relationship between the international environmental law and other related fields of commerce, trade, business, and human rights
Unit	Theories and Concepts of International Environmental Law
Readings	Research Handbook on International Environmental Law
Activities	Reading, revision, presentations, reports, lab visits.
Module 3; Environmental law and policy in Jordan	
Key Concepts	Jordan, climate protection law, legislation
Overview	This module highlights the status of climate change and environmental policy in Jordan. Currently there is a set of laws and regulations that govern environmental issues. Environment Protection Law No. 52 of 2006 is the

	primary legislation that organizes the environmental issues in Jordan. There are other regulations that organize specified areas such as water protection, air protection, nature protection and environmental impact. This legislative framework is essential to preserve the environment in Jordan and might affect the investment process in many cases. This suggests that policy makers should pay some attention to the relationship between investment and environmental law and policy.
Aim	This module aims at reconsidering the environmental realities in Jordan, to revise the legislations that help protect the environment, and to help making recommendations about the real needs that decision makers have to take in order to have a sustainable climate and environment.
Learning Outcomes	By the end of this module, students will be able to: - Learn about the various environmental issues that concern Jordan; - Learn about the environmental conventions and agreements Jordan is part of; - Help set the guidelines necessary to draw the successful map for sustainability.
Units	Text Resources (Chapter 8) and above.
Readings	Environmental Protection Law in Jordan
Activities	Readings, Presentations, interviews, quizzes and reports
Module 4; Case Study	
Key Concepts	Resource management, case study, discussion, presentation
Overview	You will have a choice of four case study scenarios based

	on actual resource management dilemmas. All materials needed to do the case study exercise will be given to you in advance; no additional research is required. You'll choose a stakeholder role and spend one class period meeting with the other members of your case study group to discuss the issue. Each group will compile the results of this discussion into a single paper which will serve as the foundation for an in-class presentation. Each group will be graded as a whole for the group paper and presentation, and each student is expected to actively participate.
Aim	This module aims to practice the environmental theory through thoroughly searching for information about a specific issue that concerns the climate and the environment. This activity involves field visits and making interviews and then classroom presentations.
Learning Outcomes	By the end of this module, students will be able to: - Learn about the environmental policies and laws in Jordan; - Practice the environmental theory through field visits; - Be aware and thus raise awareness of decision makers and the public about the dangers of climate and environment exhaustion.
Units	Sections and chapters will be distributed on students prior to the time allocated for this case study activity
Readings	Environmental Law (1,2,4,5,6,7,9)
Activities	Labs, field visits, reports, presentations

Jerash University

Course Syllabus

College: Economics and Administrative Science
Department: Banking and Finance

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: Ec 206310
Course Name: Fiscal and Monetary Policies
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:

- ✓ **Course Description:**

The purpose of this course is to introduce students to current issues in macroeconomic policy. It will explore both the theoretical debates and the practical issues faced by policymakers. It will cover a wide range of monetary and fiscal policy topics. It will analyze the policies of central banks and fiscal authorities as they relate to the stability and growth of the macro-economy. Examines the theoretical and empirical literature regarding the conduct of monetary and fiscal policy and applies the tools of economic analysis to understand macroeconomic policy debates.

✓ **Course Learning Objectives:**

- Introduce students to current issues in macroeconomic policy
- Explore both the theoretical debates and the practical issues faced by policymakers
- Examination of monetary and fiscal policies that governments may use to pursue macroeconomic objectives such as steady output growth, high employment, and low inflation.
- Transmission of monetary policy, international comparisons of monetary policy design, theories of fiscal policy, and analysis of the empirical effects of fiscal policy.

✓ **Expected Course Outcomes:**

16. Define key components of the monetary system and fiscal policy.
17. Demonstrate knowledge of the fundamental issues in monetary theory as they related to policy debate.
18. Use monetary theory to analyze how monetary and fiscal policy affects key macroeconomic variables.
19. Demonstrate understanding of theories and the empirical effects of fiscal policy.
20. Access data and conduct statistical analysis as it relates to policy debates.

✓ **Course Resources:**

40. Reading material consists of handouts/internet websites.
41. Greenlaw, S. (2006) Doing Economics: A Guide to Understanding and Carrying Out Economic Research. Boston, MA: Houghton Mifflin.

42. The Economics of Money, Banking and Financial Markets, Frederic S. Mishkin, Seventh Edition, Addison Wesley, 2006
43. Public Finance and Public Policy, Jonathan Gruber, Worth Publishers, 2005
44. Macroeconomics, Olivier Blanchard, Prentice Hall, Fourth Edition, 2006

Part 3: Assignments, Course policies, and Grading Policy

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Final Exam	50%
Total	100%

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Part 4: Course Outline/Schedule

Week	Topics
1	Overview of the course Intermediate Macroeconomic Theory
2	The IS/MP/IA Model & The Phillips Curve
3	Continuation
4	Overview of Modern Macroeconomic Theory
5	Monetary Policy Implementation
6	Overview of the Federal Reserve and Monetary Policy in the world
7	Implementation of Monetary Policy
8	Regulatory Functions of the Federal Reserve System
9	Issues and Debates in Monetary Policy Connecting Theory to Practice
10	Rules versus Discretion
11	Central Bank Independence
12	Continuation

Week	Topics
13	Fiscal Policy
14	The Case for and Against Discretionary Fiscal Policy
15	Government Finance and National Savings in the Short Run and the Long Run
16	Final Exams' week

Part 5: Course Modules

Module 1; Introduction: Brief Review on Macro Policy.	
Key Concepts	Macro-economy, Policy.
Overview	Macroeconomics deals with the performance, structure, behavior, and decision-making of an economy as a whole, rather than individual markets. This includes national, regional, and global economies. Macroeconomists develop models that explain the relationship between such factors as national income, output, consumption, unemployment, savings, investment, international trade and finance. In contrast, microeconomics is primarily focused on the actions of individual agents, such as firms and consumers, and how their behavior determines prices and quantities in specific markets. This module will focus on macroeconomics and its theories and policies.
Aim	Enhance Student knowledge about macro policies.
Learning Outcomes	At the end of this module, student will be able to: 45. Discuss the macroeconomic theories.
Units	1. Intermediate Macroeconomic Theory 2. Overview of Modern Macroeconomic Theory.
Readings	- Greenlaw, S. (2006) Doing Economics: A Guide to Understanding and

	Carrying Out Economic Research. Boston, MA: Houghton Mifflin. - The Economics of Money, Banking and Financial Markets, Frederic S. Mishkin, Seventh Edition, Addison Wesley, 2006 - Public Finance and Public Policy, Jonathan Gruber, Worth Publishers, 2005 - Macroeconomics, Olivier Blanchard, Prentice Hall, Fourth Edition, 2006 - Mankiw, N.G. (2006). The Macroeconomist as Scientist and Engineer. *Journal of Economic Perspectives*, *20(*4), 29-46.
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes
Module 2; The Monetary Policy	
Key Concepts	Monetary Policy.
Overview	Monetary policy is the process by which the monetary authority of a country controls the supply of money, often targeting a rate of interest for the purpose of promoting economic growth and stability. Monetary policy, to a great extent, is the management of expectations. It rests on the relationship between the rates of interest in an economy, that is, the price at which money can be borrowed, and the total supply of money. Monetary policy uses a variety of tools to control one or both of these, to influence outcomes like economic growth, inflation, exchange rates with other currencies and unemployment. This module will focus on the monetary policies and how it affects the economics.
Aim	Enhance student understanding of the role of monetary policies on economics.
Learning Outcomes	At the end of this module, student will be able to: 46. Define Monetary Policy.

	47. Apply the monetary policies tools.
Units	1. How does monetary policy affect the economy? 2. Tools of Monetary policy 3. Conduct of Monetary Policy: Goals and Targets 4. International Finance and Monetary Policy 5. Monetary Theory
Readings	- Greenlaw, S. (2006) Doing Economics: A Guide to Understanding and Carrying Out Economic Research. Boston, MA: Houghton Mifflin. - The Economics of Money, Banking and Financial Markets, Frederic S. Mishkin, Seventh Edition, Addison Wesley, 2006 - Public Finance and Public Policy, Jonathan Gruber, Worth Publishers, 2005 - Macroeconomics, Olivier Blanchard, Prentice Hall, Fourth Edition, 2006 http://www.ssc.wisc.edu/econ/workshop/Spring%202012/Dedola-imbalances-madison.pdf
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes
Module 3; Fiscal Policy and The Budget	
Key Concepts	Fiscal, Policy, Budget.
Overview	Fiscal policy is the use of government revenue collection (mainly taxes) and expenditure (spending) to influence the economy. When the government changes the levels of taxation and government spending (budget), it influences aggregate demand and the level of economic activity. Fiscal policy can be used to stabilize the economy over the course of the business cycle. Fiscal policy can be distinguished from monetary policy, in that fiscal policy deals with taxation and

	government spending and is often administered by an executive under laws of a legislature, whereas monetary policy deals with the money supply, lending rates and interest rates and is often administered by a central bank. This module will introduce students to fiscal policy and compare it with other polices.
Aim	Enhance student understanding of fiscal policy.
Learning Outcomes	At the end of this module, student will be able to: 48. Discuss fiscal policy 49. Compare between fiscal and monetary policies.
Units	1. What is the outlook for fiscal policy? 2. Tax Cuts 3. Can fiscal policy be effective in an open economy? 4. Outlook for the Tax System
Readings	- Greenlaw, S. (2006) Doing Economics: A Guide to Understanding and Carrying Out Economic Research. Boston, MA: Houghton Mifflin. - The Economics of Money, Banking and Financial Markets, Frederic S. Mishkin, Seventh Edition, Addison Wesley, 2006 - Public Finance and Public Policy, Jonathan Gruber, Worth Publishers, 2005 - Macroeconomics, Olivier Blanchard, Prentice Hall, Fourth Edition, 2006 http://ntj.tax.org/wwtax/ntjrec.nsf/0/7c24a2cd1543c2d2852567ef0057a8a1/$FILE/v48n3329.pdf -https://www.bostonfed.org/economic/conf/conf49/introduction.pdf
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes

Jerash University

Course Syllabus

College: Education
Department: Kindergarten

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 703215
Course Name: Health Education
Class Hours: (Times & Days)
Classroom:(Number & Building)

Prerequisites:

Course Description:

Health Education and environment the key emphasis of the course is to provide students with knowledge and skills to empower them to take care of their health and the health of others and the environment. The success of the course would be determined by students' demonstration of behavior such as practicing good health habits and exhibiting socially responsible behavior. This can be achieved through a variety of learning experiences to present students the opportunity to apply what they have learnt. The course has four modules they are; physical health, nutrition, mental and environmental health.

Course Learning Objectives:

1. Demonstrate the various published definitions of "health."
2. Demonstrate concept of optimal health in developing a personal view of health.
3. Demonstrate the history of national disease prevention and health promotion activities.
4. Demonstrate key risk factors affecting health promotion and longevity.
5. Demonstrate the core foundation areas underlying health education as an applied discipline.
6. Be able to understand a good health practices and habits.
7. Recognize their part in helping to keep the environment safe and clean for everyone's health.

Expected Course Outcomes:

1. Demonstrate opportunities for professional specialization in health education.
2. Demonstrate options for individual credentialing as a professional health educator.
3. Demonstrate development of criteria for ethical professional practice in health education.
4. Demonstrate the increasing role of health informatics and gene research in research and practice.
5. Demonstrate trends potentially affecting health education in the future
6. Use and apply good health practices in the real life situations.
7. Differentiate types of diseases that are potentially harmful to human being health.
8. Managing conflicts as well as relationships during puberty stage.
9. Identify the legislations and regulations regarding environmental issues.

10. Identify significant gaps in the current knowledge base concerning the health effects of environmental agents and identify areas of uncertainty in the risk-assessment process.

Course Resources:

Text book; Moeller, D. W. (1997). *Environmental health* (Revised ed.). Cambridge: Harvard University Press.
Supportive;
- Health education journal (sage publisher)

Part 3: Assignments, Course policies, and Grading Policy

- ✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*
- ✓ ***Grade Components:***

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

- ✓ **Grading Policy:** In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

- ✓ **Course Policies:** All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither gives nor receive unauthorized assistance.
- ✓ ***Homework Assignments:*** *Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.*
- ✓ ***Late Policy:*** *The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.*
- ✓ ***Cheating:*** *Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.*
- ✓ ***Classroom Protocol and Participation Guidelines:*** *Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.*

Part 4: Course Outline/Schedule

Week	Topic
1	Course Introduction
2	Physical Health
3	Physical Health treatment
4	Physical Health change
5	Physical Health Assessment
6	Nutrition
7	Life Cycle Nutrition
8	Pregnancy
9	Infant
10	Adult
11	Mental Health

Week	Topic
12	Mental Disorder
13	Values and Ethics
14	Human impact on the environment
15	Environment-human interaction
16	Final Exam

Part 5: Course Modules

Module 1; Physical Health	
Key Concepts	Physical change, Nutrition
Overview	Physical health is critical for overall well-being and is the most visible of the various dimensions of health, which also include social, intellectual, emotional, spiritual and environmental health. Some of the most obvious and serious signs that we are unhealthy appear physically. This module will provide students with an understanding of good health practices and habits such as nutrition, exercise and hygiene which can contribute to good

	physical growth and health. Students are going to recognize the different physical changes one goes through during puberty.
Aim	- Become familiar with research on physical conditions, treatments, and demographic variables in the physical health field - Become familiar with current issues in the field of physical health that affect research and practice - Be able to understand a good health practices and habits
Learning Outcomes	- Applying good health practices in the real life situations. - Conduct hands-on investigations in environmental health in which students gather and analyze data and produce reports in written and oral formats.
Units	- Physical health - The importance physical health - Self confidence - Frustration
Readings	- Selected journals from Health education journal(sage publisher) - Moeller, D. W. (1997). *Environmental health* (Revised ed.). Cambridge: Harvard University Press.
Activities	YouTube, cooperation learning, Assignment, Lab Visits
Module 2; Nutrition	
Key Concepts	Pregnancy, Lactation, Infants, Adolescents, Adults
Overview	This module involves the study of special nutritional needs, physiology, and health concerns of pregnant and lactating women, infants, children, adolescents, adults and older adults. Humans require the same nutrients throughout their lifespan however the amount of specific nutrients varies at different stages

	in the life cycle and varies according to gender, activity level and growth. Certain health conditions and diseases similarly alter nutritional requirements. Course components include readings, activities, and discussions that highlight the relationships between nutrition and physical and psychological growth, development and aging.
Aim	- Discuss, contrast, and evaluate the roles of nutrition and wellness within the complex processes of pregnancy, lactation, child development, growth and aging. - Distinguish, adapt for, and design nutrition and wellness interventions which integrate the social, psychological and physical influences on maternal and child development, growth and aging.
Learning Outcomes	By the end of this module students should be able to: - Understand the role of nutrition and changes in nutritional requirements that occur during the life cycle in humans. - Understand how and why nutrient needs change during each stage of the life cycle. - Identify major areas of nutritional concern in each stage of the life cycle, including the impact of physiological and developmental changes. - Identify nutritional risk factors that may lead to chronic disease through case studies of various stages of the life cycle.
Lessons	- Nutrition through life cycle - Lactation - Childhood - Adolescence - Aging

Readings	- Nutrition throughout the Lifecycle, 4th edition, by Judith E. Brown. Wadsworth Cengage Learning Publishing.
Activities	Case study, Chapter Review, Discussion, Web Search
Module 3; Mental Health	
Key Concepts	Mental Health, Mental Disorder, Values , Ethics
Overview	This module provides an overview of multidimensional factors, perspectives and approaches associated with mental disorder. It surveys major perspectives and reviews the history of the perception of mental disorder in western society. Classification, diagnosis, therapeutic approaches and institutional responses within the context of social work practice, values and ethics are discussed. Medical, legal, and social issues related to mental health and the treatment of people with mental disorders are addressed.
Aim	- Develop a critical understanding of the historical and contemporary perspectives on mental deviance or mental illness - Develop an appreciation of the subjective distress and/or experiences of individuals labeled as mentally deviant or mentally ill
Learning Outcomes	- Develop an awareness of current classification and processing of the mentally disordered - Trace the history and current status of legal insanity, rights of patients, and related legal issues - Learn about the differential effects of mental disorder with regard to sex, age, race and socioeconomic status.
Units	- Mental health - Mental Illness and Society - Concepts Definitions & Types of Mental Illness

Readings	- Gallager, B. J., Sociology of Mental Illness: New Jersey: Prentice-Hall
Activities	Discussions, Reports, Field Trip, Simulation
Module 4; Environmental Health	
Key Concepts	**Environmental Health, Biomarkers, Risk Analysis**
Overview	**Examines health issues, scientific understanding of causes, and possible future approaches to control of the major environmental health problems in industrialized and developing countries. Topics include how the body reacts to environmental pollutants; physical, chemical, and biological agents of environmental contamination; vectors for dissemination (air, water, soil); solid and hazardous waste; susceptible populations; biomarkers and risk analysis; the scientific basis for policy decisions; and emerging global environmental health problems.**
Aim	- Define the major sources and types of environmental agents. - Discuss the transport and fate of these agents in the environment. - Identify the carriers or vectors that promote the transfer of these agents from the environment to the human. - Describe how these agents interact with biological systems, and the mechanisms by which they exert adverse health effects. - Explain and use models for prediction of the magnitude of adverse effects in biological systems. - Identify and define the steps in the risk-assessment and risk-management processes.
Learning Outcomes	- Identify the legislations and regulations regarding

	environmental issues. - Identify significant gaps in the current knowledge base concerning the health effects of environmental agents and identify areas of uncertainty in the risk-assessment process.
Lessons	- Environmental health issues - Environmental health problems - Environmental toxicology
Readings	- Moeller, D. W. (1997). *Environmental health* (Revised ed.). Cambridge: Harvard University Press.
Activities	Project , group work, Simulation, Case Study

Jerash University

Course Syllabus

College: Economics and Administrative Science
Department: Banking and Finance

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:

E-mail:

Part 2: Course Information

Course Number: Ec 206202
Course Name: Managerial Economics
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:

✓ **Course Description:**

Managerial Economics is concerned with the application of economic principles to key management decisions within organizations. It provides guidance to increase value creation within organizations, and allows a better understanding of the external business environment in which organizations operate.

Managerial Economics is fundamentally a unique way of thinking about problems, issues and decisions that managers face in each of the functional areas of their organization. This unique way of thinking stresses the importance of incentives as determinants of human behavior and performance, and emphasizes the consideration of costs and benefits as an efficient method for reaching economic decisions.

✓ **Course Learning Objectives:**

- To increase student company's profitability by applying economic analysis to a wide array of business problems.
- To market environments where decisions are made under full information and with a single layer of strategic reasoning.
- Deals with a single individual and discusses the problem of making decisions when the outcomes are uncertain.

✓ **Expected Course Outcomes:**

21. Compute the relevant costs of any decision.
22. Use marginal analysis to make extent (how much) decisions.

23. Make investment decisions that increase firm value.
24. Set optimal prices and price discriminate.
25. Predict industry-level changes using demand/supply analysis.
26. Make decisions in uncertain environments.

✓ **Course Resources:**

50. Reading material consists of handouts/internet websites.
51. Froeb, McCann, Managerial Economics: A Problem-Solving Approach, 2nd Edition. (South-Western, 2010).
52. The Economic Way of Thinking by Paul Heyne, Peter J. Boettke and David L. Prychitko, Prentice Hall, 2009 (12th edition).
53. Microeconomics for Manager by David M. Kreps (W.W. Norton, 2004)

Part 3: Assignments, Course policies, and Grading Policy

✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

✓ ***Grade Components:***

Component	Grade
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First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

- ✓ **Grading Policy:** In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

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Part 4: Course Outline/Schedule

Week	Topics
1	Intro: What is Managerial Economics?
2	Managerial Economics: The One Lesson of Business Benefits, Costs, and Decisions

Week	Topics
3	Using Economics in Management Decisions, Understanding the Seller's Costs
4	Extent (How Much) Decisions Understanding the Buyer's Demand
5	Investment Decisions: Look Ahead & Reason Back Understanding Markets and Profit Maximizing
6	Simple Pricing
7	Economies of Scale and Scope
8	Understanding Markets and Industry Changes
9	Relationships Between Industries: The Forces Moving Us Towards Long Run Equilibrium
10	Strategy--the Quest to Slow Profit Erosion
11	Using Supply and Demand; Foreign Exchange, Trade, and Bubble
12	More Realistic and Complex Pricing
13	Direct Price Discrimination & Indirect Price Discrimination
14	Presentations
15	Revision
16	Final Exams' week

Part 5: Course Modules

Module 1; The Economic Way of Thinking	
Key Concepts	Economy, Managerial.
Overview	Managerial economics sometimes referred to as business economics and is a branch of economics that applies microeconomic analysis to

	decision methods of businesses or other management units. This module defines the study of economics by describing both what economics *is* and what it *is not.* It introduces the perspective that economic reasoning skills are valuable critical thinking tools and demonstrates how this perspective enhances users' ability to analyze and understand human behavior, the focus of social science inquiry. On the other hand, the module will focus on managerial economics, what is it, and how it would affect economists decisions.
Aim	Enhance student understanding of economics and managerial economics.
Learning Outcomes	At the end of this module, students will be able to: 54. Describe economics by using critical thinking tools 55. Discuss managerial economics and its uses.
Units	1. What is Managerial Economics? 2. The One Lesson of Business 3. Benefits, Costs, and Decisions 4. Using Economics in Management Decisions
Readings	-Froeb, McCann, Managerial Economics: A Problem-Solving Approach, 2nd Edition. (South-Western, 2010). -The Economic Way of Thinking by Paul Heyne, Peter J. Boettke and David L. Prychitko, Prentice Hall, 2009 (12th edition). -Microeconomics for Manager by David M. Kreps (W.W. Norton, 2004). - http://www.comp.nus.edu.sg/~ipng/mecon/sg/01int_sg.pdf
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes
Module 2; Demand Analysis & Demand Estimation	
Key Concepts	Demand, Analysis, Estimation.

Overview	Demand analysis is a study of sales generated by a good or service to determine the reasons for its success or failure, and how its sales performance can be improved. Demand analysis is used to identify who wants to buy a given product, how much they are likely to pay for it, how many units they might purchase, and other factors that can be used to determine product design, selling cost, and advertising strategy for a product. To estimate how many sales a company will make, demand estimation is a process that is commonly used. With demand estimation, a company can measure how much to produce and make other important decisions. This module will focus on demand analysis and estimation and its application.
Aim	Enhance student knowledge about demand analysis and estimation.
Learning Outcomes	At the end of this module, students will be able to: 56. Define the term demand 57. Apply demand analysis and estimation in different economic situations.
Units	1. Extent (How Much) Decisions 2. Understanding the Buyer's Demand
Readings	-Froeb, McCann, Managerial Economics: A Problem-Solving Approach, 2nd Edition. (South-Western, 2010). -The Economic Way of Thinking by Paul Heyne, Peter J. Boettke and David L. Prychitko, Prentice Hall, 2009 (12th edition). -Microeconomics for Manager by David M. Kreps (W.W. Norton, 2004). https://www.princeton.edu/~deaton/downloads/Demand_Analysis.pdf -http://www.econ.umn.edu/~bajari/metricsappliedsp09/lecture6.pdf
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes

Module 3; Profit Maximization and Competitive Markets	
Key Concepts	Profits, Markets.
Overview	Profit maximization is the short run or long run process by which a firm determines the price and output level that returns the greatest profit. A perfectly competitive firm with rising marginal costs maximizes profit by producing up until the point at which marginal cost is equal to marginal revenue. The marginal revenue for a perfectly competitive firm is the market price determined by the intersection of the supply and demand curves. A competitive market is one in which a large numbers of producers compete with each other to satisfy the wants and needs of a large number of consumers. In a competitive market no single producer, or group of producers, and no single consumer, or group of consumers, can dictate how the market operates. Nor can they individually determine the price of goods and services, and how much will be exchanged. This module will introduce students to the concepts of profit maximization and competitive markets.
Aim	Enhance student understanding about profit maximization and competitive markets
Learning Outcomes	At the end of this module, students will be able to: 58. Differentiate between profit maximization and competitive markets
Units	1. Investment Decisions: Look Ahead & Reason Back 2. Understanding Markets and Profit Maximizing 3. Understanding Markets and Industry Changes
Readings	-Froeb, McCann, Managerial Economics: A Problem-Solving Approach, 2nd Edition. (South-Western, 2010). -The Economic Way of Thinking by Paul Heyne, Peter J. Boettke and David L. Prychitko, Prentice Hall, 2009 (12th edition).

	-Microeconomics for Manager by David M. Kreps (W.W. Norton, 2004).
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes
Module 4; Advanced Pricing	
Key Concepts	Pricing.
Overview	Pricing is the process of determining what a company will receive in exchange for its product or service. Pricing factors are manufacturing cost, market place, competition, market condition, brand, and quality of product. It is also a key variable in microeconomics price allocation theory. The manual or automatic process of applying prices to purchase and sales orders, based on factors such as: a fixed amount, quantity break, promotion or sales campaign, specific vendor quote, price prevailing on entry, shipment or invoice date, combination of multiple orders or lines, and many others. Automated systems require more setup and maintenance but may prevent pricing errors. The needs of the consumer can be converted into demand only if the consumer has the willingness and capacity to buy the product. This module will focus on pricing methods and its applications in any economical situation faced by students.
Aim	Enhance student understanding the types of pricing and applications.
Learning Outcomes	At the end of this module, student will be able to: 59. Identify and distinguish between pricing types.
Units	1. Simple Pricing 2. More Realistic and Complex Pricing 3. Direct Price Discrimination 4. Indirect Price Discrimination
Readings	-Froeb, McCann, Managerial Economics: A Problem-Solving Approach, 2nd Edition. (South-Western, 2010).

	-The Economic Way of Thinking by Paul Heyne, Peter J. Boettke and David L. Prychitko, Prentice Hall, 2009 (12th edition). -Microeconomics for Manager by David M. Kreps (W.W. Norton, 2004). -http://www.uk.sagepub.com/upm-data/43169_1.pdf -http://www.saylor.org/site/wp-content/uploads/2012/12/BUS2031.2.2_Pricing-the-product.pdf
Activities	Participation in class room, assignments and homework Reading, group discussion, Giving examples, presentations, quizzes

Jerash University

Course Syllabus

College: Arts
Department: English Language and Translation

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours:
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 108201
Course Name: Scientific Translation
Class Hours:
Classroom:
Prerequisites:

✓ Course Description:

It is unquestionable that English–Arabic scientific translation is increasingly becoming a topic of much concern and importance today. This course highlights the problems that are likely to be encountered in English–Arabic scientific translation and tries to establish certain possible factors which may finally lead to a theory of this sort of translation. It also identifies certain differences that exist between scientific texts and literary ones. The course also proposes a model for English–Arabic scientific translation in further attempts driving at a more extensive study. This course has another dimension that highlights scientific texts related to climate change and environmental issues drawn from the different scientific fields of ecology, zoology, mineralogy, and chemistry.

✓ Course Learning Objectives:

1- Students will improve their skills for developing knowledge translation plans in research through translating scientific texts and focus on texts that are concerned with the environment and sustainability.
2- Students will improve their abilities for communicating research findings to multiple audiences and this shall raise awareness on universal issues of the climate and the environment.
3- Students will improve their understanding and skills related to sharing research knowledge through the media, that is, watching video clips, movies, and TV, then respond to them in translation.
4- Students will develop knowledge and skills related to linking with policy and decision-makers.

✓ Expected Course Outcomes:

1- Able to independently formulate and analyze critically complex scientific and Professional problems, substantiate decisions made, especially when it comes to the issues of ecosystems and environment.
2- Able to work across various disciplines (technical translation, respective technical field, culture studies, etc.);
3- Able to apply knowledge on translation theory and practice;
4- Able to ensure the accuracy of the translation, stylistic cohesion between the source and target text, adequate usage of terminology;
5- Able to establish linguistic and extra linguistic relationships in language use in connection with translation studies, research methods, principles and approaches;
6- Able to acquire skills in analyzing translation, relating semantic and pragmatic aspects of translation with translation methods;
7- Able to conduct scientific research and compile research reports;
· Able to analyse, evaluate and use research literature on translatology;
8- Able to independently make decisions within own scope of responsibilities;
8- Able to evaluate the relevance of one's own professional competences and skills to the profession standard and the requirements of the international labour market;
9- Able to work according to professional ethics principles and associate that with environmental ethics.

✓ Course Resources:

- Nida, Eugene (1964) Toward a Science of Translating, Leiden: Brill, 156-171; reprinted in Venuti 2000: 126-140 (Also in the 2004 edition).
- Helme, S. and Javed, S. (1994). Unpacking science and technology: science and technology literacy in adult basic education.
- Neubert, A. (1992). "Competence in translation: a complex skill, how to study and how to teach it."
- Snell Hornby, M., Pöchhacker, F. and Kaindl, K. (eds). Translation studies: An interdiscipline. Amsterdam/Philadelphia: John Benjamins Publishing Company, 411-420.
- O'Hagan, M. and Ashworth, D. (2002) Translation-Mediated Communications in a Digital World: Facing the Challenges of Globalization and Localization. Clevedon: Multilingual Matters Ltd.
- "Science TEKS Toolkit." On line at: http://www.tenet.edu/teks/science/assessment/methods/faq.html (consulted 15.02.2004)

Part 3: Assignments, Course policies, and Grading Policy

- ✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*
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Final Exam	50%
Total	100%

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Part 4: Course Outline/Schedule

Week	Topics
1	Introduction to the course
2	Define, identify, and illustrate the different types of translation.
3	Discuss the various problems faced by translators of scientific texts.
4	Describe the process of translating scientific words.
5	Describe the process of translating scientific phrases and clauses.
6	Describe the process of translating oral and written scientific discourses.
7	Continuation of the same activities First Exam Due
8	Editing Translation Skills
9	Continuation of the same activities
10	Scientific Translation Technology
11	Continuation of the same activities

Week	Topics
	Second Exam Due
12	Audiovisual Scientific Translation
13	Continuation of the same activities
14	Practical Translation
15	Continuation of the same activities
16	Evaluation and Assessment Final Exam

Part 5: Course Modules

Module 1; Scientific Translation: Beginnings	
Key Concepts	Philosophy, vision, and mission. Define translation.
Overview	This module provides students who have no previous experience of specialist translation in science/technology with the opportunity to reach an acceptable professional level of translation competence. It combines regular translation practice in smaller groups throughout course with a background lecture on the underlying principles of science and technology.
Aim	Acquaint students with the definition and nature of scientific translation. Familiarize them with text types that can be classified as scientific. Introduce some of the strategies of doing such type of translation.
Learning Outcomes	By the end of this module, learners are expected to be able

	to define and identify scientific texts and they are expected to apply the strategies.
Units	Introduction The Tradition of Translating in the Western World An Introduction to the Nature of Meaning
Readings	Toward a Science of Translating
Activities	Discussion, group work, presentations
Module 2; Translation Technology	
Key Concepts	Technology, Translation, machine Translation, computer lab
Overview	This module provides an introduction to online resources for translators, from machine translation to terminology-management and translation-memory systems with a view to understanding the tools of the translator's trade and also as a basis for systematic compilation of your own bilingual and multilingual resources and their use in translation. This hands-on module taught in a computer lab with individual workstations for each student also shows you how to import your past translations into a translation-memory system and build your own freelance translator's website.
Aim	Help students better translate scientific, technological, climactic, and environmental texts via the computer.
Learning Outcomes	Be skilful in doing such kind of work. Be professional base work on computers.
Units	Types of Correspondences and Contrasts Techniques of Adjustment Translation Procedures

	Machine Translation
Readings	Toward a Science of Translating
Activities	Lab visits, individual translations, quizzes
Module 3; Practical Translation	
Key Concepts	Scientific, Medical, Technical, climate, environment, sustainability.
Overview	This module provides training in translation methods and techniques in both Arabic and English, pairs and fields of specialization. It is taught through an introductory lecture and through interactive, practical seminars. The module is divided into three distinct blocks: 1) Scientific Translation (to include popular science articles, scientific journal papers, scientific reports, proposals, etc.) that focus on issues of the climate and the environment and how to sustain our environment and stop the harmful and irresponsible activities. 2) Medical Translation (to include healthcare documents, medical reports, clinical case studies, pharmaceutical reports, etc.) 3) Technical Translation (to include user guides, product documentation, patents, technical specifications, institutional documentation, etc.). And to take this knowledge and apply it on such texts from an environment perspective.
Aim	Read and Translate scientific articles and texts. Learn about the environment through doing the translation

Learning Outcomes	Be skilful in doing such kind of work. Be professional base work on computers.
Units	Referential and Emotive Meanings The Dynamic Dimension in Communication The Role of the Translator
Readings	Toward a Science of Translating
Activities	Interactive and practical seminars, individual and group work, discussion, computer-based translation
Module 4; Audiovisual Translation	
Key Concepts	Subtitling, films, environmental and climate aspects
Overview	This module introduces you to Audiovisual Translation (AVT) practices in general, and offers you an in-depth knowledge in the field of subtitling. During the lectures and seminars, you will cover areas such as history and present situation of subtitling, pros and cons of subtitle versus other AVT modes, semiotics of subtitling, conventions used on screen, and economic and professional aspects of AVT. You will develop subtitling skills in a variety of registers and styles by translating texts and programs of an audiovisual nature drawn from various sources (films, corporate videos, documentaries) and covering a broad range of specialized genres and media issues that are concerned with environmental issues. You will produce your own subtitles with appropriate subtitling equipment.
Aim	Translate audiovisual subtitles in films and videos that are mainly interested with scientific and environmental issues
Learning Outcomes	Be skilful in doing such kind of work. Be professional base work on computers.
Unit	Interpreting Theory and Training

Readings	Translation Studies: An Interdisciplinary
Activities	Lab visits, discussion, and group work
Module 5; Translation of Persuasive Texts (Climatic and Environmental Texts)	
Key Concepts	Discourse, cognitive environment, audiovisual, digital
Overview	This module is designed to offer students an overview of issues of discursive organization in texts whose aim is to alter the cognitive environment and behavior of recipients. The main focus is advertising discourse in various forms, from the printed, to the electronic and audiovisual. In addition, it analyzes the effect of the digital internet and its impact on translation
Aim	This module aims to encourage students' select persuasive texts and address the audience of the importance of sustainability.
Learning Outcomes	Focus on Persuasive texts whose main interest in nature and the environment. Publish these translations to help raise awareness about health and environment issues.
Units	Setting the Scene: Page 1-22
Readings	Translation-Mediated Communications in a Digital World: Facing the Challenges of Globalization and Localization.
Activities	Writing, translating, pair work, quizzes

Jerash University

Course Syllabus

College: Science
Department: Biology

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 302447
Course Name: Biodiversity
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:302345

✓ **Course Description:**

This course examines the meaning of biodiversity, the disciplines associated with conservation biology, including taxonomy, genetics, small population biology, origin of species and biodiversity of the different kingdoms. And the course will focus also in the value of genetic recourses and it is role in sustainable and human life.

✓ **Course Learning Objectives:**

- To study Darwin theory: Descent with Modification
- To know how population evolve
- To know how species arise
- To have an idea about the history of life on earth
- To know the meaning of phylogeny and tree of life
- To study the diversity in the five kingdoms
- To understand the meaning of conservation biology
- To have idea about global change and sustainable development

✓ **Expected Course Outcomes:**

At the end of the course the student must;

27. Explain what Darwin meant by "descent with modification"
28. Define the terms population, species, gene pool, relative fitness, natural selection, and neutral variation
29. Apply the Hardy-Weinberg equation to a population genetics problem
30. Define and discuss the limitations of the four species concepts
31. Describe and provide examples of prezygotic and postzygotic reproductive barriers
32. Describe and suggest evidence for the major events in the history of life on Earth from Earth's origin to 2 billion years ago
33. Explain the importance of the phylogeny and tree of life
34. Know the diversity in Monea kingdom
35. Explain why the kingdom Protista is no longer considered a legitimate taxon
36. Describe four shared characteristics and four distinct characteristics between charophytes and land plants
37. Distinguish between the phylum Bryophyta and bryophytes
38. Explain the diversity within seed plants
39. List the characteristics that distinguish fungi from other multicellular kingdoms
40. List the characteristics that combine to define animals
41. To know that Invertebrates are animals that lack a backbone and they account for 95% of known animal species
42. List the derived traits for: chordates, craniates, vertebrates, gnathostomes, tetrapods, amniotes, birds, mammals, primates, humans
43. Distinguish between conservation biology and restoration biology
44. List the three major threats to biodiversity and give an example of each

45. Explain the importance of bioremediation and biological augmentation of ecosystem processes in restoration efforts
46. Describe the concept of sustainable development
47. Explain the goals of the Sustainable Biosphere Initiative

✓ **Course Resources:**

60. Text; Biology by Mader, 11th, 2012
61. Supportive; Biology by Mader, 11th, 2012
62. Supportive; World Wide Fund for Nature (WWF) website: http://www.wwf.org/

Part 3: Assignments, Course policies, and Grading Policy

✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

✓ ***Grade Components:***

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

✓ **Grading Policy:** In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by

the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

- ✓ **Course Policies:** All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither gives nor receive unauthorized assistance.

- ✓ Homework Assignments:Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.

- ✓ Late Policy: The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.

- ✓ Cheating: Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.

- ✓ Classroom Protocol and Participation Guidelines: Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.

Part 4: Course Outline/Schedule

Week	Topic	Readings
1	Descent with Modification: A Darwinian View of Life	Chapter 22
2	The Evolution of Populations	Chapter 23
3	The Origin of Species	Chapter 24
4	The History of Life on Earth	Chapter 25
5	Phylogeny and the Tree of Life	Chapter 26
6	Bacteria and Archaea and first exam	Chapter 27
7	Protists	Chapter 28

Week	Topic	Readings
8	Plant Diversity I: How Plants Colonized Land	Chapter 29
9	Plant Diversity II: The Evolution of Seed Plants	Chapter 30
10	Fungi	Chapter 31
11	An Introduction to Animal Diversity and second exam	Chapter 32
12	Invertebrates	Chapter 33
13	Vertebrates	Chapter 34
14	Conservation Biology and Restoration Ecology	Chapter56
15	Revision	
16	Final exams	

Part 5: Course Modules

Module 1; Evolution	
Key Concepts	Mechanisms of evolution
Overview	Endless Forms Most Beautiful The Smallest Unit of Evolution That "Mystery of Mysteries" Lost Worlds
Aim	To have a basic knowledge on mechanisms of evolution
Learning Outcomes	1. Explain what Darwin meant by "descent with modification" 2. Define the terms population, species, gene pool, relative fitness, natural selection, and neutral variation 3. Apply the Hardy-Weinberg equation to a population genetics problem 4. Define and discuss the limitations of the four species

	concepts 5. Describe and provide examples of prezygotic and postzygotic reproductive barriers 6. Describe and suggest evidence for the major events in the history of life on Earth from Earth's origin to 2 billion years ago
Units	Unit one; 1. The Darwinian revolution challenged traditional views of a young Earth inhabited by unchanging species 2. Descent with modification by natural selection explains the adaptations of organisms and the unity and diversity of life 3. Evolution is supported by an overwhelming amount of scientific evidence Unit two; 1. Mutation and sexual reproduction produce the genetic variation that makes evolution possible and Hardy-Weinberg equation 2. Natural selection, genetic drift, and gene flow can alter allele frequencies in a population 3. Natural selection is the only mechanism that consistently causes adaptive evolution Unit three; 1. The biological species concept emphasizes reproductive isolation 2. Speciation can take place with or without geographic separation and hybrid zones 3. Speciation can occur rapidly or slowly and can result from changes in few or many genes

	Unit four; 1. Conditions on early Earth made the origin of life possible and fossil record documents the history of life 2. Key events in life's history include the origins of single-celled and multicelled organisms and the colonization of land 3. The rise and fall of dominant groups reflect continental drift, mass extinctions, and adaptive radiations
Readings	Chapters: 22, 23, 24, 25
Activities	Lectures Group discussion Assignments Quizzes
Module 2; Biological diversity	
Key Concepts	The evolutionary history of biological diversity
Overview	Investigating the Tree of Life Masters of Adaptation Living Small The Greening of Earth Transforming the World Mighty Mushrooms Welcome to Your Kingdom Life Without a Backbone Half a Billion Years of Backbones
Aim	The study of biological diversity in the five kingdoms
Learning Outcomes	1. Explain the importance of the phylogeny and tree of life 2. Know the diversity in Monea kingdom

	3. Explain why the kingdom Protista is no longer considered a legitimate taxon 4. Describe four shared characteristics and four distinct characteristics between charophytes and land plants 5. Distinguish between the phylum Bryophyta and bryophytes 6. Explain the diversity within seed plants 7. List the characteristics that distinguish fungi from other multicellular kingdoms 8. List the characteristics that combine to define animals 9. To know that Invertebrates are animals that lack a backbone and they account for 95% of known animal species 10. List the derived traits for: chordates, craniates, vertebrates, gnathostomes, tetrapods, amniotes, birds, mammals, primates, humans
Units	Unit one; 1. Phylogenies show evolutionary relationships and Phylogenies are inferred from morphological and molecular data 2. Shared characters are used to construct phylogenetic trees and An organism's evolutionary history is documented in its genome 3. Molecular clocks help track evolutionary time and New information continues to revise our understanding of the tree of life 4. Structural and functional adaptations contribute to prokaryotic success, Rapid reproduction, mutation, and genetic recombination promote genetic diversity in

	prokaryotes, and Diverse nutritional and metabolic adaptations have evolved in prokaryotes 5. Molecular systematics is illuminating prokaryotic phylogeny, Prokaryotes play crucial roles in the biosphere, and Prokaryotes have both harmful and beneficial impacts on humans Unit two; 1. Most eukaryotes are single-celled organisms and Excavates include protists with modified mitochondria and protists with unique flagella 2. Chromalveolates may have originated by secondary endosymbiosis and Rhizarians are a diverse group of protists defined by DNA similarities 3. Red algae and green algae are the closest relatives of land plants and Unikonts include protists that are closely related to fungi and animals 4. Land plants evolved from green algae 5. Mosses and other nonvascular plants have life cycles dominated by game 6. Ferns and other seedless vascular plants were the first plants to grow tall 7. Seeds and pollen grains are key adaptations for life on land and Gymnosperms bear “naked” seeds, typically on cones 8. The reproductive adaptations of angiosperms include flowers and fruits 9. Human welfare depends greatly on seed plants Unit three; 1. Fungi are heterotrophs that feed by absorption and Fungi produce spores through sexual or asexual life

	cycles 2. The ancestor of fungi was an aquatic, single-celled, flagellated protest and Fungi have radiated into a diverse set of lineages 3. Fungi play key roles in nutrient cycling, ecological interactions, and human welfare 4. Animal are multicellular, heterotrophic eukaryotes with tissues that develop from embryonic layers and The history of animals spans more than half a billion years 5. Animals can be characterized by “body plans” and New views of animal phylogeny are emerging from molecular data Unit four; 1. Sponges are basal animals that lack true tissues and Cnidarians are an ancient phylum of eumetazoans 2. Lophotrochozoans, a clade identified by molecular data, have the widest range of animal body forms 3. Ecdysozoans are the most species-rich animal group 4. Chordates have a notochord and a dorsal, hollow nerve cord, Craniates are chordates that have a head, and Vertebrates are craniates that have a backbone 5. Gnathostomes are vertebrates that have jaws and Tetrapods are gnathostomes that have limbs 6. Amniotes are tetrapods that have a terrestrially adapted egg and Mammals are amniotes that have hair and produce milk
Readings	Chapters: 26, 27, 28, 29, 30, 31, 32, 33, 34
Activities	Lecturs

	Group discussion Visit to plant and animal labs Assignments Quizzes
Module 3; Ecology	
Key Concepts	Ecology
Overview	The module aims at explaining the importance of bioremediation and biological augmentation of ecosystem processes in restoration efforts
Aim	To have basic things about biological conservation and global change
Learning Outcomes	1. Distinguish between conservation biology and restoration biology 2. List the three major threats to biodiversity and give an example of each 3. Define biodiversity hot spots and explain why they are important 4. Define zoned reserves and explain why they are important 5. Explain the importance of bioremediation and biological augmentation of ecosystem processes in restoration efforts 6. Describe the concept of sustainable development 7. Explain the goals of the Sustainable Biosphere Initiative
Units	1: Restoration ecology and Population conservation 2: Sustainable development
Readings	Chapter 56
Activities	Lecturing

	Group discussion Quizzes Visiting Natural reserve

Jerash University

Course Syllabus

College: Science
Department: Biology

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 302101
Course Name: General Biology
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:

✓ **Course Description:**

This course is the prerequisite to most higher courses in biology. An introduction to the fundamental principles of biology, including cell structure, chemistry, and function; genetics; and ecology and climate variation.

✓ **Course Learning Objectives:**

- To develop understanding and appreciation for the basic principles of the science of biology, starting with macromolecules and the cell and ending with ecology.
- To give the student an introduction on restoration which return degraded ecosystems to natural state
- To provide the students with knowledge about sustainable development and the improvement of human life.
- To prepare students for more advanced courses in biology and science, with an understanding of cell processes.
- To provide students with knowledge necessary to help solve problems in biological areas, beginning at the cellular level.
- To introduce students to the scientific method.

✓ **Expected Course Outcomes:**

The successful student will be able to;

48. Differentiate between monomers and polymers
49. Know the structure and function of carbohydrates, lipids, proteins and nucleic acids
50. Describe the characteristics found in all living organisms.
51. Identify the organelles found in the cell and know the function of each.
52. Differentiate between the types of cell transport processes.
53. Differentiate between the light and dark reaction of photosynthesis.
54. Name the environmental factors important to photosynthesis.
55. Know the organelle and site of photosynthesis.
56. Differentiate between the different kinds of respiration occurring in the cell, including the site of respiration and number of ATP molecules produced.
57. Identify the steps in mitosis and explain their importance in cell division.
58. Differentiate between mitosis and meiosis including the number of cell divisions and chromosome numbers.
59. Describe the stages of meiosis I and meiosis II.
60. Set-up and successfully work a monohybrid, dihybrid, test, and sex-linked crosses.

61. Identify dominant, recessive, and incomplete dominant traits in humans.
62. Explain DNA replication.
63. Explain protein synthesis.
64. Distinguish among the following types of ecology: organismal, population, community, ecosystem, and landscape
65. Explain how dispersal may contribute to a species' distribution
66. Distinguish between the following pairs of terms: potential and actual range, biotic and abiotic factors, macroclimate and microclimate patterns
67. Explain how a body of water or mountain range might affect regional climatic conditions
68. Explain how ecologists may estimate the density of a species
69. Explain how limited resources and trade-offs may affect life histories
70. Explain how biotic and abiotic factors may work together to control a population's growth
71. Explain why worldwide agriculture could feed more people if all humans consumed only plant material
72. Describe the four nutrient reservoirs and the processes that transfer the elements between reservoirs
73. Explain the importance of bioremediation and biological augmentation of ecosystem processes in restoration efforts
74. Describe the concept of sustainable development
75. Explain the goals of the Sustainable Biosphere Initiative

- ✓ **Course Resources:**
  63. Text; Biology by Cambpell, 9^{th} , 2011
  64. Support reading; Biology by Mader, 11^{th}, 2012

Part 3: Assignments, Course policies, and Grading Policy

- ✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

- ✓ ***Grade Components:***

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

- ✓ **Grading Policy:** In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

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Part 4: Course Outline/Schedule

Week	Topic	Readings
1	The chemistry of life	Chapter 5
2	The cell	Chapter 6
3	Membrane structure and function	Chapter 7
4	An introduction to metabolism	Chapter 8
5	Cellular respiration and fermentation and first exam	Chapter 9
6	photosynthesis	Chapter 10
7	The cell cycle	Chapter 12
8	Meiosis and sexual life cycles	Chapter 13
9	Mendel and the gene idea and second exam	Chapter 14
10	An introduction to ecology and the biosphere	Chapter 52
11	Population ecology	Chapter 53
12	Community ecology	Chapter 54
13	Ecosystems and restoration ecology	Chapter 55
14	Conservation biology and global change	Chapter 56
15	Revision	
16	Final exams	

Part 5: Course Modules

Module 1; The chemistry of life	
Key Concepts	The chemistry of life
Overview	All living things are made up of four classes of large biological molecules: carbohydrates, lipids, proteins, and nucleic acids
Aim	The study of macromolecule's structure and function
Learning Outcomes	Differentiate between monomers and polymers Know the structure and function of carbohydrates, lipids, proteins and nucleic acids
Units	1: Macromolecules and Carbohydrates 2: Lipids 3: Proteins and Nucleic acids
Readings	Chapter 5
Activities	Regular class activities Making models for the different classes of large molecules Group discussion Quizzes
Module 2; The cell	
Key Concepts	The cell
Overview	All organisms are made of cells. The cell is the simplest collection of matter that can live. The plasma membrane is the boundary that separates the living cell from its surroundings. The plasma membrane exhibits selective permeability,

	allowing some substances to cross it more easily than others. Living cells require energy from outside sources. Photosynthesis is the process that converts solar energy into chemical energy. The continuity of life is based on the reproduction of cells, or cell division.
Aim	The study of cell types and component The study of metabolism The cell cycle
Learning Outcomes	Describe the characteristics found in all living organisms. Identify the organelles found in the cell and know the function of each. Differentiate between the types of cell transport processes. Differentiate between the light and dark reaction of photosynthesis. Name the environmental factors important to photosynthesis. Know the organelle and site of photosynthesis. Differentiate between the different kinds of respiration occurring in the cell, including the site of respiration and number of ATP molecules produced. Identify the steps in mitosis and explain their importance in cell division.
Units	1: microscope and eukaryotic cells 2: nucleus, ribosome, and endomembrane system 3:mitochondria, chloroplast, cytoskeleton and extracellular components 4: cell membrane component and selective permeability 5: transport through membrane: passive, active, and bulk. 6: law of thermodynamics

	7: free-energy change and ATP 8: enzymes 9: catabolic pathways 10: glycolysis and citric acid cycle 11: citric acid cycle and fermentation first exam 13: photosynthesis and light energy 14: light reactions 15: calvin cycle and C4 and CAM plants 16: mitosis 17: mitotic phase 18: regulation of mitosis
Readings	Chapters: 6, 7, 8, 9, 10, 12
Activities	Lecturing Video films Group discussion Quizzes
Module 3; Genetics	
Key Concepts	Genetics
Overview	Genetics is the scientific study of heredity and variation. What genetic principles account for the passing of traits from parents to offspring? The location of a particular gene can be seen by tagging isolated chromosomes with a fluorescent dye that highlights the gene
Aim	The study of meiosis and introduction to genetics
Learning Outcomes	Differentiate between mitosis and meiosis including the number of cell divisions and chromosome numbers.

	Describe the stages of meiosis I and meiosis II. Set-up and successfully work a monohybrid, dihybrid, test, and sex-linked crosses. Identify dominant, recessive, and incomplete dominant traits in humans. Explain DNA replication. Explain protein synthesis.
Units	1: genes from parents 2: fertilization and meiosis 3: sexual life cycle, genetic variation and evolution 4: Mendel and Mendel's laws 5: Mendel and Mendel's laws 6: chromosomal theory of inheritance
Readings	Chapters: 13, 14
Activities	Group discussion Visit to genetic lab Quizzes
Module 4; Ecology	
Key Concepts	Ecology
Overview	Ecology is the scientific study of the interactions between organisms and the environment Ecology is the scientific study of the interactions between organisms and the environment Ecosystems range from a microcosm, such as an aquarium, to a large area such as a lake or forest Humans are rapidly pushing many species toward extinction
Aim	To know the meaning of ecology and to study the interaction between living and non-living component of ecosystem. The role of sustainable development in human life

Learning Outcomes	1. Distinguish among the following types of ecology: organismal, population, community, ecosystem, and landscape 2. Explain how dispersal may contribute to a species' distribution 3. Distinguish between the following pairs of terms: potential and actual range, biotic and abiotic factors, macroclimate and microclimate patterns 4. Explain how a body of water or mountain range might affect regional climatic conditions 5. Explain how ecologists may estimate the density of a species 6. Explain how limited resources and trade-offs may affect life histories 7. Explain how biotic and abiotic factors may work together to control a population's growth 8. Explain why worldwide agriculture could feed more people if all humans consumed only plant material 9. Describe the four nutrient reservoirs and the processes that transfer the elements between reservoirs 10. Explain the importance of bioremediation and biological augmentation of ecosystem processes in restoration efforts 11. Describe the concept of sustainable development 12. Explain the goals of the Sustainable Biosphere Initiative
Units	1: earth's climates and biomes 2: aquatic biomes and interactions between ecosystem components

	second exam 4: biological processes 5: Life history traits are products of natural selection Lesson 6: factors that regulate population growth are density dependent 7: human population 8: Community interactions 9: Dominant and keystone species 10: Disturbance influences species diversity and composition 11: Physical laws govern energy flow and chemical cycling in ecosystems 12: Human activities 13: Restoration ecology and Population conservation 14: Sustainable development 15: Sustainable development
Readings	Chapters: 52, 53, 54, 55, 56
Activities	Group discussion Quizzes Nature reserves

Jerash University

Course Syllabus

College: Science

Department: Chemistry

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 301101
Course Name: General chemistry
Class Hours: (Times & Days)
Classroom:(Number & Building)
Prerequisites:

✓ **Course Description:** (Include climate change and sustainability policy concepts)
This course is the prerequisite to higher courses in chemistry. An introduction to the fundamental principles of chemistry, Basic concepts: matter, units of measurements, uncertainty in measurements. Stoichiometery equations, atomic and molecular weights, moles, chemical calculations, Reactions in solution and their calculations, Structure of the atom periodic properties of the elements, Chemical bonding, Gases and green chemistry will be from the main topics in this course.

- **Course Learning Objectives**;
- The course will introduce the student to the world of chemistry, Problem solving, data evaluation, and analysis are stressed. Applications of chemistry to daily life are included.
- Describe and use the scientific method; Use the periodic table.

- Give the electronic configurations of elements; Use formulas; Know 3 basic types of chemical reactions (Acid-base, precipitation, redox).
- Use moles and molarities; understand the 3 states of matter; Work with the ideal gas law; Draw Lewis structures.
- To prepare students for more advanced courses in chemistry and science, with an understanding of chemical processes.
- Give the students basic knowledge about green and environmental chemistry.

✓ **Expected Course Outcomes:**

The successful student will be able to;

76. Know what is meant by scientific method
77. Know the measurement and the metric system
78. Know the significant figures and laboratory calculations.
79. Have a good overview of elements, compound, physical and chemical changes.
80. Know what is meant by atomic mass, molar mass.
81. Know moles and Avogadro's number.
82. Know the chemical reactions and chemical equations.
83. Know the limiting reaction and yield.
84. Differentiate between the precipitation reaction, acid base reaction and oxidation reduction reaction.
85. Define the aqueous solution and solubility.
86. Have an idea about the electromagnetic radiation and Bohr's Theory.
87. Have an introduction to quantum mechanics and quantum number.
88. Know the electron configuration and the building up principle.
89. Know the periodic classification of the elements.
90. Know the periodic variation in physical properties.
91. Know the periodic variation in atomic and ionic radius.
92. Know the periodic variation in ionization energy.
93. Know the periodic variation in electronic affinity.
94. Know the chemical bond types.
95. Differentiate between the covalent and ionic bonds.

96. Know the electronegativity.
97. Writing Lewis structures.
98. Calculate the formal charges of the molecules.
99. Draw the resonance structures of molecules.
100. Know the octet rule and the exceptions.
101. Strengths of covalent bonds.
102. Properties of solutions.
103. Know the colligative properties of solutions.
104. Know the ways of expressing the solution concentrations.
105. Know the acids and bases equilibria and the pH terms.
106. Calculate Ionization constant and the percent ionization.
107. Differentiate between Lewis acids and bases.
108. Write the gas law and the ideal gas equation.
109. Calculate Molecular effusion and diffusion.
110. Know the earth‘s atmosphere.
111. Know outer region of the atmosphere.
112. Know the Ozone in the upper atmosphere.
113. Know the chemistry of the Troposphere.
114. Know the World Ocean and fresh water.
115. Can conclude the GREEN CHEMISTRY meaning.

- ✓ **Course Resources:** (List the required course texts, course material, recommended websites, and other readings) and (Include resources about climate change and sustainability policy concepts)
  65. Text; Chemistry: the central science. By Brown 11th, 2009
  66. General Chemistry: The Essential Concepts. by Raymond Chang, 7th , 2011

Part 3: Assignments, Course policies, and Grading Policy

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Part 4: Course Outline/Schedule

Week	Topic	Readings
1	Introduction; Chemistry world Matter and measurement	Chapter 1
2	Chemistry world ; Atoms, Molecules, and Ions	Chapter 2
3	Chemistry world ; Stoichiometry. Calculations with chemical formula and equations	Chapter 3
4	Reactions; Aqueous reactions and solution stoichiometry	Chapter 4

Week	Topic	Readings
5	Electronic structure of atoms	Chapter 6
6	Electronic structure of atoms	Chapter 6
7	Periodic properties of the elements	Chapter 7
8	Basic concepts of chemical bonding	Chapter 8
9	Molecular geometry and bonding theories	Chapter 9
10	Properties of solutions	Chapter 13
11	Acid_ base equilibrium	Chapter 16
12	Additional aspects of aqueous equilibrium	Chapter 17
13	Gases	Chapter 10
14	Chemistry of the environment	Chapter 18
15	Revision	
16	Final exams	

Part 5: Course Modules

Module 1; Chemistry world	
Key Concepts	Principle of Chemistry world
Overview	The chemistry science come from large part of experimental way
Aim	Data analysis, evaluation and problem solution.
Learning Outcomes	Know the scientific method, measurement and the metric system, dimensional analysis, significant figures and laboratory calculations.
Units	1: Matter and measurement 67. scientific method, measurement and the metric system 68. dimensional analysis

	69. significant figures and laboratory calculations
Readings	Chapter 1
Activities	Regular class activities Group discussion Quizzes Conducting experiments in the laboratory and make the calculations.
Module 2; Chemical reactions	
Key Concepts	Chemical equations and reactions
Overview	To know how to write the chemical equation and predict the products of the reactions, the students have to know the meaning of atomic mass, moles, Avogadro's number, molar mass, empirical formulas, chemical reactions and chemical equations, limiting reagents and yields.
Aim	To study the chemical reactions. To study the atom, molecules and the empirical formula.
Learning Outcomes	Know what is meant by atomic mass, molar mass, moles and Avogadro's number. Differentiate between the chemical reaction and physical reaction. Know the chemical reactions and chemical equations, limiting reaction and yield. Differentiate between the precipitation reaction, acid base reaction and oxidation reduction reaction.
Units	1: brief history of the nation of atoms 2: discover the electrons and the nuclear model of the atom. 3: modern theory of atomic structure including the atomic number, mass number, isotops and atomic weights.

	4: examine the organization the elements into the periodic table 5: discuss the assemblies of atoms called molecules. 6: learn that the atoms can lose or gain electrons to form ions.
Readings	Chapters: 2,6,8,9
Activities	Group discussion Video films Models
Module 3; Stoichiometry	
Key Concepts	Stoichiometry
Overview	Stoichiometry is the area of study that examines the quantities of substances consumed and produced in chemical reaction. It is important to know how they measure the concentration of ozone in the atmosphere, determining the potential yield of gold from ore.
Aim	To have a quantitative information from balanced equation
Learning Outcomes	Know the chemical reactions and chemical equations. Know the limiting reaction and yield. Differentiate between the precipitation reaction, acid base reaction and oxidation reduction reaction.
Units	1: chemical equation 2: combination reactions, decomposition reactions, and combustion reactions 3: use a chemical formula to relate the masses of substances to the number of atoms. 4: quantitative information from balanced equation. 5: the limiting reaction.
Readings	Chapters: 1, 3,

Activities	Group discussion Quizzes
Module 4; Electronic configuration of atom	
Key Concepts	Electronic configuration of atom
Overview	Study the electromagnetic radiation (wave length and frequency) and energy relationship, know the idea of Quantized energy, know the quantum numbers relate to the number and type of orbitals, and recognized the different orbitals shapes. Draw an energy level diagram for the orbitals of many electron atoms. Use the periodic table to write abbreviated electron configuration and determine the number of unpaired electrons in an atom.
Aim	Write the electronic configurations of elements;
Learning Outcomes	Have an introduction to quantum mechanics and quantum number. Know the electron configuration and the building up principle. Know the periodic classification of the elements. Know the periodic variation in physical properties. Know the periodic variation in atomic and ionic radius. Know the periodic variation in ionization energy. Know the periodic variation in electronic affinity. Know the chemical bond types. Differentiate between the covalent and ionic bonds. Know the electronegativity. Writing Lewis structures. Calculate the formal charges of the molecules. Draw the resonance structures of molecules.

	Know the octet rule and the exceptions. Recognized the different orbitals shapes. Draw an energy level diagram for the orbitals of many electron atoms.
Units	1: the light (radiant energy). 2: electromagnetic radiation. 3: line spectra and Bohr model. 4: the wave behavior of matter. 5: Quantum mechanics and atomic orbitals. 6: Representation of orbitals. 7: Many electron atoms. 8 : electron configurations. 9 : Electron configuration and the periodic table.
Readings	Chapters: 2, 6, 7.
Activities	Group discussion Quizzes
Module 5; Gases	
Key Concepts	Gases
Overview	The gases have a large part in chemistry science; the student should start by the distinguishing characteristics of gases with those of liquids and solids. The student has to know about the presser, the gas law, the ideal gas equation, and further application of the ideal gas equation.
Aim	Consider that the gas law can be expressed in terms of its volume, presser, temperature, and the quantity of gas.
Learning Outcomes	Write the gas law and the ideal gas equation. Calculate Molecular effusion and diffusion.

Units	1: compare the distinguishing characteristics of gases with those of liquids and solids. 2: study the gas presser. 3: examine several relationships among volume, presser, temperature, and quantity of gas. 4: ideal gas equation. 5: calculate the density and molar mass of a gas. 6: partial presser of mixture of gases. 7: molecular effusion and diffusion.
Readings	Chapter 10
Activities	Group discussion Quizzes
Module 6; Environment	
Key Concepts	Environment
Overview	Human activities have a large impact on the global warming which is the most urgent environmental problem. Chemistry is often at the heart of this issue. The economic growth of nations depends critically on chemical processes that range from treatment of water supplies to industrial processes.
Aim	Chemistry and environment
Learning Outcomes	Know the earth‘s atmosphere, outer region of the atmosphere, and the Ozone in the upper atmosphere. Know the chemistry of the Troposphere. Know the world ocean and fresh water. Can conclude the GREEN CHEMISTRY meaning.
Units	1: Earth’s atmosphere . 2: Outer region of the atmosphere. 3: Ozone in the upper atmosphere. 4: Chemistry of the Troposphere.

	5: World ocean. 6: Fresh water. 7: Green chemistry.
Readings	Chapter 18
Activities	Group discussion Quizzes

Jerash University

Course Syllabus

College: Science
Department: Physics

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 340101
Course Name: General Physics
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:

✓ **Course Description:**

This course is the prerequisite to the higher courses in physics. It offers an Introduction into the *Physics* of the *Climate* Systems and the physical methods to investigate quantitatively different systems in the physical mechanisms behind *climate* Focuses with environmental applications. Explores physical processes that shape and form the environment, studies the forces of nature and the properties of matter.

This course Include: Measurement and system of units, vectors, motion in one and two dimensions, particle dynamics and Newton's laws of motion, work and energy, conservation of energy, dynamics of system of particles, center of mass, conservation of linear momentum, collisions, impulse, rotational kinematics, rotational dynamics, conservation of angular momentum, elasticity, fluids, oscillatory motions, waves and sound, Heat and thermodynamics.

✓ **Course Learning Objectives:**(Include climate change and sustainability policy concepts)

- Distinguish between scalar and vector quantities.
- Calculate vector components and use vector properties to solve problems.
- Understand the physical relationships expressed by equations.
- Describe the motion of objects in one and two dimensions in terms of displacement, velocity, acceleration, and time.
- Draw force diagrams and apply Newton's laws to solve problems involving several forces acting on a system.
- Understand the relationship between work and energy.
- Solve problems utilizing the laws of conservation of energy and momentum.
- Understand the conditions for equilibrium.
- Mathematically describe the relationship between linear and angular quantities.
- Solve problems involving rotational dynamics.

- Understand and apply Archimedes principle and Bernoulli's equation to solve fluid problems.
- Have a clear and logical presentation of the basic concepts and principles of mechanics.
- Understand the concepts and principles through a broad range of interesting applications to the real world.
- Discuss the kinetic theory of gases.
- Solve problems that require understanding temperature changes, thermal expansion, calorimetric theory, and heat transfer.
- Understand the laws of thermodynamics.
- Compare simple harmonic motion with uniform circular motion.
- Describe the characteristics of oscillating systems.
- Understand superposition and interference of waves.
- Describe sound waves in terms of their frequency, wave length, sound level, and velocity.
- Understand the role of basic physics in human life

✓ **Expected Course Outcomes;**

After completion of this course, students will:

1. Apply knowledge of linear motion, forces, energy, and circular motion to explain natural physical processes and related technological advances, especially to climate systems.
2. Use an understanding of algebraic mathematics along with physical principles to effectively solve problems encountered in everyday life, further study in science, and in the professional world.
3. Investigate quantitatively different systems in the physical mechanisms behind climate Focuses with environmental applications.
4. Design experiments and acquire data in order to explore physical principles, effectively communicate results, and critically evaluate related scientific studies.
5. Assess the contributions of physics to our evolving understanding of global change and sustainability while placing the development of physics in its historical and cultural context.
6. Attain knowledge about the Green-house effect and the solar energy.
7. Explain how man affects the environment and how and why the temperature of the Earth is increasing and how the sea level rise.

✓ **Course Resources:**

- Text; Physics for Scientists and Engineers, by Serway and Jewett, 7^{th} Edition.

- Fundamentals of Physics, by Halliday, Resnick, and Walker.
- Physics for Scientists and Engineers with Modern Physics, Douglas C. Giancoli

Part 3: Assignments, Course policies, and Grading Policy

✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

✓ ***Grade Components:***

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

✓ **Grading Policy:** In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

✓ **Course Policies:** All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither gives nor receive unauthorized assistance.

- ✓ ***Homework Assignments:*** *Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.*
- ✓ ***Late Policy:*** *The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.*
- ✓ ***Cheating:*** *Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.*
- ✓ ***Classroom Protocol and Participation Guidelines:*** *Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.*

Part 4: Course Outline/Schedule

Week	Topic	Readings
1	Motion in One Dimension	Chapter2
2	Motion in Two Dimension	Chapter3
3	Vectors	Chapter4
4	The Laws of Motion	Chapter5
5	Energy and conservation of energy	Chapter 7, 8
6	Linear Momentum and Collisions	Chapter 9
7	Rotation of a Rigid Object About a Fixed Axis and angular momentum	Chapters, 10, 11

Week	Topic	Readings
8	Static Equilibrium and Elasticity	Chapter12
9	Universal Gravitation	Chapter13
10	Fluid Mechanics	Chapter14
11	Oscillatory Motion and wave motion	Chapters 15,16
12	Sound Waves	Chapters 17, 18
13	Temperature and Thermodynamics	Chapters 19,20
14	The Kinetic Theory of Gases	Chapters 21, 22
15	Revision	
16	Final Exam	

Part 5: Course Modules

Module 1; Mechanics	
Key Concepts	**mechanics**
Overview	Classical mechanics is of vital importance to students from all disciplines. It is highly successful in describing the motions of different objects, such as planets, Mechanics deal with Kinematics which includes position, velocity, acceleration, dynamics, and Newton's laws of motion, work, kinetic energy, energy and momentum conservation, rotational motion, conservation of angular momentum.
Aim	• Distinguish between scalar and vector quantities. • Calculate vector components and use vector properties to solve problems. • Understand the physical relationships expressed by equations. • Describe the motion of objects in one and two dimensions in

	terms of displacement, velocity, acceleration, and time. • Draw force diagrams and apply Newton's laws to solve problems involving several forces acting on a system. • Understand the relationship between work and energy. • Solve problems utilizing the laws of conservation of energy and momentum. • Understand the conditions for equilibrium. • Mathematically describe the relationship between linear and angular quantities. • Solve problems involving rotational dynamics.
Learning Outcomes	Apply knowledge of linear motion, forces, energy, and circular motion to explain natural physical processes and related technological advances, especially to climate systems. Use an understanding of algebraic mathematics along with physical principles to effectively solve problems encountered in everyday life, further study in science, and in the professional world. Investigate quantitatively different systems in the physical mechanisms behind climate Focuses with environmental applications.
Units	1: Physics and measurements; - Position, Velocity, and Speed, instantaneous velocity and speed, acceleration. - One-Dimensional Motion with Constant Acceleration, Freely Falling Objects. - Coordinate Systems, Vector and Scalar Quantities and Some Properties of Vectors. - Components of a Vector and Unit Vectors - The Position, Velocity, and Acceleration Vectors - In two-Dimensional Motion with Constant Acceleration

	- Projectile Motion - Uniform Circular Motion and Tangential and Radial Acceleration 2: The Concept of Force, Newton's First Law and Inertial Frames; - Mass, Newton's Second and Third Laws, The Gravitational Force and Weight. - Applications of Newton's Laws. - Forces of Friction. - Work Done by a Constant Force, the Scalar Product of Two Vectors. - Work Done by a Varying Force. 3: Kinetic Energy and the Work–Kinetic Energy Theorem; - The Non-isolated System-Conservation of Energy and Situations Involving Kinetic Friction. - Potential Energy of a System, The Isolated System-Conservation of Mechanical Energy. 4: Conservative and Non-conservative Forces and Changes in Mechanical Energy for non-conservative Forces. Exam 1 5: Linear Momentum and Its Conservation, Impulse and Momentum; - Collisions in One Dimension - Two-Dimensional Collisions 6: The Center of Mass, Motion of a System of Particles. - Angular Position, Velocity, and Acceleration - Rotational Motion with Constant Angular Acceleration. - Angular and Linear Quantities, Rotational Kinetic Energy - Calculation of Moments of Inertia, Torque and Relationship Between Torque and Angular Acceleration - Work, Power, and Energy in Rotational Motion, Rolling

	Motion of a Rigid Object. - Angular Momentum, Angular Momentum of a Rotating Rigid Object and Conservation of Angular Momentum. 7: Newton's Law of Universal Gravitation, Measuring the Gravitational Constant, Free-Fall Acceleration and the Gravitational Force. - Kepler's Laws and the Motion of Planets, The Gravitational Field - Gravitational Potential Energy, Energy Considerations in Planetary and Satellite Motion
Readings	Chapters 1,2,3,4,5,,7,8,910,11,12,13
Activities	Lecturing, group discussions, Simple experiments, discussions, Exercises and home works 5 minutes seminars about certain subjects Quizzes
Module 2; Fluids	
Key Concepts	Fluid
Overview	A fluid is a collection of molecules that are randomly arranged and held together by weak cohesive forces and by forces exerted by the walls of a container. Both liquids and gases are fluids. First, we consider the mechanics of a fluid at rest-that is, fluid statics. We then treat the mechanics of fluids in motion-that is, fluid dynamics.
Aim	To study the fluid statics, fluid dynamics.
Learning Outcomes	Will explore the buoyant force that supports these balloons and other floating objects.
Units	1:-Pressure, Variation of Pressure with Depth, Pressure Measurements.

	2:-Buoyant Forces and Archimedes's Principle 3:-Fluid Dynamics Bernoulli's Equation and Other Applications of Fluid Dynamics
Readings	Chapter 14
Activities	Lecturing, group discussions, Exercises and home works 5 minutes seminars about certain subjects Quizzes
Module 3; Oscillatory motion and Waves	
Key Concepts	Oscillatory motion and Waves
Overview	A special type of motion called periodic motion. This is a repeating motion of an object in which the object Continues to return to a given position after a fixed time interval. A special case of periodic motion is called simple harmonic motion. All periodic motions can be modeled as combinations of simple harmonic motions. Simple harmonic motion also forms the basis for our understanding of mechanical waves. Sound waves, seismic waves, waves on stretched strings, and water waves are all produced by some source of oscillation. The concepts of electromagnetic waves and how they propagate through space.
Aim	To study vibrations and the concepts of waves.
Learning Outcomes	-understand and describe simple harmonic motion (SHM). -Able to derive the equations of motions for physical systems that undergo SHM
Units	1:- Mathematical Representation of Simple Harmonic Motion 2:-The Pendulum, Damped Oscillations and Forced Oscillations 3:- Sinusoidal Waves, the Speed of Waves on Strings, reflection and transmission and rate of Energy Transfer by

	Sinusoidal Waves on Strings 4:-Speed of Sound Waves, Periodic Sound Waves Intensity of Periodic Sound Waves. 5:-Exam 2 The Doppler Effect 6:-Superposition and Interference 7:- Standing Waves, Standing Waves in a String Fixed at Both Ends 8:-Resonance, Beats: Interference in Time and Non-sinusoidal Wave Patterns
Readings	Chapter15,16,17,18
Activities	Lecturing, group discussions, Simple experiments on simple pendulum and waves Exercises and home works 5 minutes seminars about certain subjects Quizzes
Module 4; Thermodynamics	
Key Concepts	Heat, Thermodynamics
Overview	The study of thermodynamics involves Situations in which the temperature or state (solid, liquid, gas) of a system changes due to energy transfers. Thermodynamics is very successful in explaining the bulk properties of matter and the correlation between these properties and the mechanics of atoms and molecules.
Aim	To study Temperature and Thermodynamics Laws.
Learning Outcomes	-Explain heat transformation. -Give knowledge about the Green-house effect and the solar energy. -Explain how man affects the environment and how and why the

	temperature of the Earth is increasing
Units	Heat and Thermodynamics 1. Temperature, Heat, Heat Transfer. 2. Ideal Gas Law. 3. First Law of Thermodynamics including Calorimetric and Phase Changes 4. Heat Engines and Second Law of Thermodynamics
Readings	Chapters 19,20,21,22
Activities	Lecturing, group discussions, Simple experiments on simple pendulum and waves Exercises and home works 5 minutes seminars about certain subjects Quizzes

Jerash University

Course Syllabus

College: Economics and Administration Sciences
Department: Accounting

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)

Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 203499
Course Name: Graduation project
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:

✓ **Course Description:**

All students are required to complete a graduation project as part of their graduation requirements. The project may be completed during the student's t third or fourth year. This course enables students to develop a professional project under the supervision of a faculty member. Students work independently, but are provided guidance on a one-on-one basis by the faculty member. The professional project requires definition of a problem statement or research question, and synthesis and integration of information from a multitude of sources. The problem statement or research question must address the Jordanian priorities in scientific research which include: water, energy, renewable energy, climate change, environments and sustainable development.

- **Course Learning Objectives:**
- To give the student basic principles about scientific research.
- To improve students skills in using electronic databases.
- To learn the students the right way to write a report.
- To discuss with the students the Jordanian scientific research priorities.
- Orientation of the students to write graduation reports in Jordanian scientific research priorities which include: water, energy, renewable energy, climate change, environments and sustainable development

✓ **Expected Course Outcomes:**

At the end of the course:

116. The students must have good knowledge in scientific research including identifying problems**.**

117. The students will be able to search in electronic databases.

118. The students know how to do literature review survey**.**

119. The students now how to write a scientific report or proposal**.**

120. The students must know the Jordanian scientific research priorities which include: energy, water, environmental and climate change**.**

121. The students must have the necessary skills to start real project for solving one of the problems in Jordan.

122. The students must finish a professional report addressing one of the Jordanian scientific research priorities.

123. The students must be able to present the project in scientific way

70. Course Resources:

71. No specific text book.
72. Internet, Scientific websites.
73. Library books.
74. Scientific papers

Part 3: Assignments, Course policies, and Grading Policy

✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

✓ ***Grade Components:***

Component	Grade
Homework & assignments	10% (4x2.5%)

First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

- ✓ **Grading Policy:** In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

- ✓ **Course Policies:** All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither gives nor receive unauthorized assistance.
- ✓ ***Homework Assignments:*** *Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.*

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- ✓ ***Cheating:*** *Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.*

- ✓ ***Classroom Protocol and Participation Guidelines:*** *Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.*

Part 4: Course Outline/Schedule

Week	Topic

Week	Topic
1	Importance of scientific research
2	Databases
3	Scientific approach for writing reports
4	Identifying problems
5	Library visiting
6	Jordanian priorities in scientific research which include: energy, water, environment and sustainable development
7	Jordanian priorities in scientific research which include: energy, water, environment and sustainable development
8	Selecting topics for each student concerning Jordanian priorities
9	Guiding students during developing their projects
10	Guiding students during developing their projects
11	Guiding students during developing their projects
12	Guiding students during developing their projects
13	Discussing projects
14	Discussing projects
15	Discussing projects
16	Discussing projects

Part 5: Course Modules

Module 1; Research

Key Concepts	Scientific research
Overview	This part of the course is dedicated to improve the skills of the student in the following topics: • Importance of scientific research. • Databases • Scientific approach for writing reports • Identifying problems
Aim	To introduce the students to the world of scientific research
Learning Outcomes	• The students must have good knowledge in scientific research including identifying problems. • The students will be able to search in electronic databases. • The students know how to do literature review survey. • The students now how to write a scientific report or proposal.
Units	1. Importance of scientific research 2. Scientific research methodology 3. Scientific approach for writing reports 4. Databases
Readings	*********
Activities	Lectures Library visits Visiting one of the Jordanian scientific research centers
Module 2; Jordanian scientific research priorities	
Key Concepts	Jordanian scientific research priorities
Overview	In this module the student must go in details about the Jordanian priorities problem

Aim	The aim of this part of the course is to draw the attention of the students to the Jordanian problems and encourage them to find solutions for these problems
Learning Outcomes	• The students must know the Jordanian scientific research priorities which include: energy, water, environmental and climate change. • The students must have the necessary skills to start real project for solving one of the problems in Jordan.
Units	1. Jordanian priorities in scientific research which include: energy, water, environment and sustainable development 2. Topics for each student concerning Jordanian priorities 3. Guiding students during developing their projects
Readings	*********
Activities	Lectures Library visits Visiting one of the Jordanian scientific research centers
Module 3; Graduation Projects	
Key Concepts	Discussing projects
Overview	The students must present their projects through seminars. Each student will have from 20 to 30 minutes to present his work
Aim	Share the results, discussion, and conclusion
Learning Outcomes	• The students must finish a professional report addressing one of the Jordanian scientific research priorities. • The students must be able to present the project in

	scientific way
Units	**********
Readings	**********
Activities	Seminars Preparing soft and hard copies of the projects

Jerash University

Course Syllabus

College: Science
Department: Physics

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number:

340203
Course Name: SPECIAL TOPICS IN MEDICAL PHYSICS

Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:

✓ **Course Description:**

Applications of physics to medicine and medical instrumentation; topics include: biomechanics, sound and hearing, noise pollution, pressure and motion of fluids, heat and temperature, global warming, electricity and magnetism in the body, electromagnetic pollution, biological effects of light, luminous pollution, use of ionizing radiation in diagnosis and therapy, radiation safety, medical instrumentation.

✓ **Course Learning Objectives:**

- Develop basic understanding of medical physics concepts.
- Develop problem-solving and critical-thinking skills.
- Learn to integrate and apply various physics concepts to real-life medical physics problems.
- Develop scientific communication skills.
- Understand the mechanical and anatomical principles that govern human motion and develop the ability to link the structure of the human body with its function from a mechanical perspective.
- Apply mathematical, computational and experimental methods in solving physical problems.
- Be able to evaluate quality of information gathered from varied sources
- Translate scientific knowledge and methods into innovations in materials science, medicine, and economics.
- Employ scientific skills and knowledge for the improvement of human life and the preservation of the environment such as climate- change and sustainability policy concepts.
- Understand the causes of negative environmental impact and give solutions to reduce them focusing on climate change and different kinds of pollutions.
- Understand the principles of protection from radiation and how to deal safely with radiations and their instruments.

✓ **Expected Course Outcomes:**

124. Describe the translation motion and rotational motion and he concept of degrees of freedom of movement.
125. Describe Levers and joints of human musculoskeletal system.
126. Identify the human body's equilibrium conditions and their impact on disease formation.

127. Identify basic principles involved in sensors instrumentation, mechanisms of different sensors, their classification, regulation and ethical use.
128. Describe motion with precise, well-defined mechanical and anatomical terminology.
129. Understand and quantify linear and angular characteristics of motion**.**
130. Understand the quantitative relationships between angular and linear motion characteristics of a rotating body.
131. Understand and quantify the cause and effect relationship between force and linear and angular motion of the body**.**
132. Describe the human body's equilibrium conditions and their impact on disease formation
133. Characterize of static flow, using coefficients of surface tension and viscosity**.**
134. Describe liquid and gas flow.
135. Use Bernoulli and Poises formulas to calculate: circulatory diseases and blood flow**.**
136. Define the basic properties of the physics of sound**.**
137. Describe the mechanism of human hearing.
138. Explain the use of physics of ultrasound and Doppler Effect in medical imaging**.**
139. Explain the effect of Noise pollution on human body**.**
140. Explain the physics of optics including reflection, refraction and their implications in use of mirrors, lenses and fiber optics**.**
141. Describe the basics of endoscopes, Laparoscopes and Phototherapy**.**
142. Describe the mechanism of physics of vision and the use of lenses in correction of the most common human vision problems**.**
143. Explain the use of UV and IR spectra in medical applications.
144. Talk about the light pollution and how to reduce it**.**
145. Define LASER**.**
146. Describe the physical concepts of LASER**.**
147. Explain the usage of LASER in medical physics**.**
148. Explain the concepts of RF coils and calculating the magnetic field gradients**.**
149. Calculate magnetic field signals by using Fourier transformation.
150. Have a good basic knowledge of Magnetic Resonance Imaging and Spectroscopy**.**
151. Understand the principles and main technical aspects of Magnetic Resonance Imaging and Spectroscopy**.**
152. Understand the basic image processing (and identify its need) and image analysis techniques**.**
153. Describe the behavior of magnetic moments in an applied magnetic field**.**
154. Explain operating principles of alpha, beta and gamma**.**
155. Explain the meaning of dosimetry**.**

156. Describe the applications of ionizing radiations in medicine**.**
157. To describe the various types of ionizing radiation**.**
158. Understand and sketch the interactions of radiation particles with atoms in tissue**.**
159. Describe the physical-chemical events which follow an ionizing event, in terms of spatial distribution and the time scale**.**
160. Describe the biological impact on living cells and tissue at the DNA, cellular, organ, and whole animal levels. Predict the expected radiobiological outcome, when presented with the ambient conditions of irradiation (e.g. energy, dose, dose rate/fractionation, oxygen level, drugs).
161. Understand the concepts of Imaging System and Telemetry and the various Therapeutic Equipment used in Medicine**.**
162. Describe the basic principles and concepts of radiation protection and safety**.**
163. Explain the radiation health and safety requirements of federal and state regulatory agencies**.**
164. To become aware of safety precautions when using radiation and be familiar with the government agencies related to the radiation exposure limits**.**
165. Discuss, examine and evaluate the radiation therapies**.**
166. Explain the importance and objectives of medical instruments and sensors in medicine**.**
167. Identify the underlying physics principles and relate them to mechanisms of a number of biomedical instruments**.**
168. Apply basic medical instruments principles to real world problems in clinical engineering, medical device design, and troubleshoot basic medical instrumentation**.**
169. Discuss the measurement of physiological parameters**.**

✓ **Course Resources:**

- McGinnis, P.M. (1999). Biomechanics of Sport and Exercise. Champaign, IL: Human Kinetics
- Biomechanics, its foundations and objectives: Edited by Y.C. Fung, N. Perrone and M. Anliker
- Medical Physics, J. Cameron and J. Skofronick
- Davidovits P. Physics in Biology and Medicine. – London: Elsevier, 2001.
- Giancoli D. C. Physics for Scientists and Engineers with Modern Physics 3rd ed., London: Prentice Hall, 2000.
- Teibe U., Berķis U., Kalniņš I., Avota Z., Sprieslis J, Poriņš V. Laboratorijasdarbifizikā (1. semestris) - Rīga, AML, 2008.
- Teibe U., Berķis U., Kalniņš I., Avota Z., Sprieslis J, Poriņš V. Laboratorijasdarbifizikā (2. semestris) - Rīga, AML, 2007.
- Moyle J. Pulse Oximetry (Principles and Practice) - Wiley-Blackwell; 2nd edition, 2002.

- Lesilie Cromwell, Fred J.Weibell,ErichA.Pfeiffer,"Bio-Medical Instrumentatio and Measurements" II edition, Pearson Education,2002/PHI
- R.S.Khandpur,"Handbook of Bio-Medical Instrumentation" Tata McGraw Hill Publishing Co.Ltd.2003.
- 11. Radiobiology for the Radiologist, E. Hall and A. Giaccia (6th edition) Part 3: Assignments, Course policies, and Grading Policy

Part 3: Assignments, Course policies, and Grading Policy

✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

✓ ***Grade Components:***

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

✓ **Grading Policy:** In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

✓ **Course Policies:** All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither gives nor receive unauthorized assistance.

- ✓ Homework Assignments: Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.
- ✓ Late Policy: The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.
- ✓ Cheating: Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.
- ✓ ***Classroom Protocol and Participation Guidelines****: Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.*

Part 4: Course Outline/Schedule

Week	Topic	Readings
1	Biomechanics Newton's laws and torque	McGinnis, P. M. (1999). Biomechanics of sport and exercise.Champaign, IL: Human and Class notes
2	Biodynamic of movements Applications from human activity	McGinnis, P. M. (1999). Biomechanics of sport and exercise. Champaign, IL: Human Kinetics.
3	Pressure Liquids and gases biomechanics.	Class notes and medical physics M. Hollins, Ch.6 Principles of Mechanics and Biomechanics By Frank Bell, Ch.8
4	Hearing Sound and Ultrasound physics and clinical	Class notes and

Week	Topic	Readings
		medical physics M. Hollins, Ch.3,8 S.Amador. Physics in Modern Medicine. 2003
5	Biological effects of light And optics	Class notes and medical physics M. Hollins, Ch.2,7
6	LASER and its application in medical physics	Class notes and Amador S. Physics in Modern Medicine. 2003
7	Electricity and magnetism	Class notes and medical physics M. Hollins, Ch.5
8	Magnetic resonance imaging and spectroscopy	Magnetic Resonance Imaging: Physical Principles and Sequence Design, by E. M. Haacke, R. W. Brown, M. R. Thompson, and R. Venkatesan, John Wiley & Sons, Inc, 1999. and class notes
9	Ionizing radiation in diagnosis and therapy	Radiation, People and the Environment, IAEA and class notes
10	Nuclear medicine	Radiobiology for the Radiologist, E. Hall and A. Giaccia (6th edition) and class notes
11	Use of X-rays for diagnosis	The Essential Physics of Medical Imaging by J.E. Bushberg, J.A. Seibert, E.M. Leidholdt JR, and J.M. Boone, Published 2nd Edition 2002 by Lippncott Williams &Wilkens and class notes
12	Radiotherapy Radiation Protection	Review of Radiation Oncology Physics: A Handbook for Teachers and Students Ch.16, class notes.

Week	Topic	Readings
13	Radiation safety	Radiation safety training manual, class notes. Radiation safety handbook. Class notes.
14	Medical instrumentation	Lecture medical physics M. Hollins, Ch.4
15	Revision	
16	Final Exam	

Part 5: Course Modules

Module 1; Biomechanics	
Key Concepts	**Biomechanics**
Overview	Biomedical is to introduce students to concepts of mechanics as they apply to human movement, particularly those pertaining to exercise, sport, and physical activity.
Aim	To have good understanding of mechanical and anatomical principles that govern human motion and develop the ability to link the structure of the human body with its function from a mechanical perspective.
Learning Outcomes	1. Describe motion with well define mechanical and anatomical terminology. 2. Apply the laws of angular and linear motion to the motions of human body. 3. Apply Newton's laws to the linear and rotational motion of the

	body. 4. Describe the translation motion and rotational motion and he concept of degrees of freedom of movement. Can describe Levers and joints of human musculoskeletal system. **5.** Describe the human body's equilibrium conditions and their impact on disease formation.
Units	Unit one; • Linear and angular kinematics • Forces and Torque. • Static equilibrium, free body diagram • Linear kinetics; inertia; mass; force; pressure. • Center of mass; Vertical jumping • Dynamics, Rotational Inertia • Techniques in 2d and 3D thatare used to analyze movement Unit two; • The Skelton. • Muscle • Stress, Strain and stiffness of biological materials • Strength and toughness of biomaterials
Readings	McGinnis, P. M. (1999). Biomechanics of sport and exercise. Champaign, IL: Human Kinetics and class notes.
Activities	Lectures Exercises and home works 5 minutes seminars about certain subjects, Quizzes
Module 2; Fluid dynamics	
Key Concepts	Pressure, Liquids and gases biomechanics.

Overview	Fluid dynamics in human body is the study of the motion of fluids (both liquid and gases) in human body. Tension static and viscosity and a number of interdisciplinary applications. The pressure and buoyancy that water can provide to a variety of problems that patients can have**.**
Aim	To simplify the method of moving fluid (liquid and gases) in human body. To gain the main principles of hydrostatics that governs the equilibrium of fluid and resistance of moving fluid.
Learning Outcomes	1. Characterize the static flow by using coefficients of surface tension and viscosity. 2. Describe liquid and gas flow. 3. Use Bernoulli and Poises formulas to calculate: circulatory diseases and blood flow.
Units	Unit one; • Visco-elasticity in biomaterials • Dynamics of moving systems • Adhesion • Surface tension and life under pressure • Fluid properties. Unit two; • Bernoulli's principle • Drag and Reynolds numbers • Shape and drag • Tube Flow and Blood flow First Exam
Readings	Class notes and medical physics M. Hollins Ch.6 Principles of Mechanics and Biomechanics By Frank Bell Ch.8

	Principles of Mechanics and Biomechanics, Frank Bell.
Activities	Lectures Exercises and home works 5 minutes seminars about certain subjects and discussions Quizzes
Module 3; Hearing Sound	
Key Concepts	Hearing Sound and Ultrasound physics and clinical
Overview	Mechanical oscillations and waves. Wave forms. Sound. Acoustics. Hearing, the mathematical description. Ultrasound and infrasound, their application in medicine; Ultrasonography and Dopplerography. Noise and its effects on the human body.
Aim	To compare sound waves that can be hearing from ultrasound waves, to recognize the mechanism of hearing in human body. To describe the use of physics of ultrasound and Doppler effect in medical imaging.
Learning Outcomes	Define the basic properties of the physics of sound. Describe the mechanism of human hearing. Explain the use of physics of ultrasound and Doppler effect in medical imaging. Explain the effect of Noise pollution on human body.
Units	Unit one; • Waves and their properties. • Sound waves physics. • Physics of hearing. • Ultrasonic Sound. Unit two; • The Doppler Effect. • Applications of sound in Medicine.

	• The effect of Noise pollution on human body.
Readings	Class notes and medical physics, M. Hollins,Ch.3,8 Amador S. Physics in Modern Medicine. 2003
Activities	Lectures Exercises and home works 5 minutes seminars about certain subjects and discussions and Quizzes.
Module 4; Light and optics	
Key Concepts	Biological effects of light and optics
Overview	Basics of bio-optics. Electromagnetic oscillations and waves. Optical wavelength range: UV and IR spectra and their biological effects on the human body. The light pollution.
Aim	Describe the physics of optics including reflection, refraction and their implications in use of mirrors, lenses and fiber optics**.**
Learning Outcomes	Explain the physics of optics including reflection, refraction and their implications in use of mirrors, lenses and fiber optics. Describe the basics of Endoscopes , Laparoscopes and Phototherapy Describe the mechanism of physics of vision and the use of lenses in correction of the most common human vision problems. Explain the use of UV and IR spectra in medical applications Talk about the light pollution and how to reduce it.
Units	Unit one; • Light and its properties(reflection and refraction) • Fiber optics • Medical applications : Endoscope, Laparoscope and

	Phototherapy Unit two; • Thin Lenses • The Physics of Vision, human Eye • Angular Magnification and Magnifying Glass and Common Vision Defects Unit three; • Electromagnetic Radiation • EM Radiation and Medical Application • Light pollution and how to decrease it.
Readings	Class notes and medical physics, M. Hollins,Ch.2,7 Amador S. Physics in Modern Medicine. 2003
Activities	Lectures Exercises and home works 5 minutes seminars about certain subjects and discussions Quizzes
Module 5; LASER	
Key Concepts	LASER and its application in medical physics
Overview	Lasers. Laser operating principles. Laser types. Laser effects on tissues. The use of lasers in medicine and cosmetology. Medicine laser safety classes. Principles of photo dynamics therapy.
Aim	To recognize LASER and its applications in medicine
Learning Outcomes	Define LASER. Describe the physical concepts of LASER. Explain the usage of LASER in medical physics.
Units	Unit one; • Basic Physics of Laser • Laser Properties • The Helium – Neon Model

	• The Ruby Laser • Other Lasers Unit two; • Medical applications : Laser surgery on the Eye and in Dermatology • Questions and problems • Clinical applications of Laser
Readings	Amador S. Physics in Modern Medicine. 2003and class notes.
Activities	Exercises and home works 5 minutes seminars about certain subjects and discussions, quizzes.
Module 6; Electricity	
Key Concepts	Electricity and magnetism
Overview	The human body's physical fields, their types and use in the medical diagnostics. Electrocardiography. Electroencephalography. Electromyography. Electrooculography. Magnetic field. Magnetocardiography. Magnetoencephalography. Magnetooculography. Human in the surrounding physical fields. Earth's magnetic field effects on the human body. Natural and artificial sources of electromagnetic field and their impact on the human body. The EM pollution.
Aim	To understand the electricity and magnetism inside the body and the effect of electricity and magnetic fields flow outside the body on the body as well as the usage of electrical and magnetic fields in medicine and EM pollution.
Learning Outcomes	Explain the electricity and magnetism inside the human body. Discuss the effects of outside electrical and magnetic fields on human body. Explain the structure and operational principles of medical equipment and direction of further

	development.
Units	Unit one; • Electricity within the body • Effect of electricity on human body, Electrical shock, electrical burn. • Electromyogram (EMG), Electrical potential in the heart (ECG), EEG,ERG ,EOG and MCG Unit two; • Biopotentials of the heart, Electrodes: Amplifiers, Electro surgery. • Magnetic resonance imaging and spectroscopy. • Safety in using EM instruments.
Readings	Class notes and medical physics,M. Hollins,Ch.5
Activities	Lectures, Exercises and home works, 5 minutes seminars about certain subjects and discussions and Quizzes.
Module 7; Magnetic Resonance Imaging and Spectroscopy in Living Systems	
Key Concepts	Magnetic Resonance Imaging, Spectroscopy, Living Systems
Overview	Theory of nuclear magnetic resonance imaging and spectroscopy is necessary to understand current methods for visualizing the structure of cells, tissues, whole animals, and humans with a focus on living systems. Also current methods allow the monitoring of biochemical processes in cells suspensions, whole animals, and humans using in vivo MR spectroscopy.
Aim	To provide students with knowledge necessary to apply modern methods of MR imaging and spectroscopy in vivo to solve research problems.
Learning Outcomes	Explain the concepts of RF coils and calculating the magnetic field gradients. Calculate magnetic field signals by using Fourier transformation.

	Have a good basic knowledge of Magnetic Resonance Imaging and Spectroscopy. Understand the principles and main technical aspects of Magnetic Resonance Imaging and Spectroscopy. Understand the basic image processing (and identify its need) and image analysis techniques. Describe the behavior of magnetic moments in an applied magnetic field.
Units	Unit one; • Behavior of magnetic moments in an applied magnetic field. • RF coils and magnetic field gradients. Unit two; • Relaxation and magnetic-field-strength dependence Signal detection and Fourier transformation • Multiple RF pulses, echoes, and one-dimensional imaging, Image contrast: SNR, relaxation, and flow Diffusion weighted imaging, Functional magnetic resonance imaging, Basic quantum description of NMR, Chemical shift and scalar coupling, Chemical-shift-selective and spectroscopic imaging, Localized MR spectroscopy and adiabatic excitation, Measurement of physiological parameters; pH and reaction rates
Readings	Magnetic Resonance Imaging: Physical Principles and Sequence Design, by E. M. Haacke, R. W. Brown, M. R. Thompson, and R. Venkatesan, John Wiley & Sons, Inc, 1999. and he Essential Physics of Medical Imaging by J.E. Bushberg, J.A. Seibert, E.M. Leidholdt

	JR, and J.M. Boone, Published 2nd Edition 2002 by Lippncott Williams &Wilkens. class notes
Activities	Exercises and home works, 5 minutes seminars about certain subjects and discussions and quizzes.
Module 8; Ionizing radiation	
Key Concepts	Radiation, Ionizing
Overview	Ionizing radiation is a type of energy released by atoms in the form of electromagnetic waves or particles. People are exposed to natural sources of ionizing radiation as in soil vegetation and human made sources as x-ray and medical devices. Ionization radiation has two very different uses in medicine for diagnosis and therapy. Both are intended benefits and risk, as with any use of radiation, the benefit must outweigh the risk.
Aim	To provide the students with the basis of radiation therapy and diagnostic imaging g studies. To explores the fundamentals of interaction between ionizing radiation and matter. Also, provide student with comprehensive knowledge of radiation therapy physics.
Learning Outcomes	Explain operating principles of alpha, beta and gamma**.** Explain the meaning of dosimetry. Describe the applications of ionizing radiations in medicine. To describe the various types of ionizing radiation. Understand and sketch the interactions of radiation particles with atoms in tissue. Describe the physical-chemical events which follow an ionizing event, in terms of spatial distribution and the time scale. Describe the biological impact on living cells and tissue at the DNA, cellular, organ, and whole animal levels. Predict the expected radiobiological outcome, when

	presented with the ambient conditions of irradiation (e.g. energy, dose, dose rate/fractionation, oxygen level, drugs).
Units	Unit One; • Ionizing Radiation • Basic Radiation Physics • Nuclear medicine Physics Unit Two; • Radiation Quantities and Units • Dose Rate Effect. • Radiation Therapy**.**
Readings	1- Radiation, People and the Environment, IAEA 2- Radiobiology for the Radiologist, E. Hall and A. Giaccia (6th edition) and class notes
Activities	Lectures, Exercises and home works, 5 minutes seminars about certain subjects and discussions and quizzes.
Module 9; Medical imaging	
Key Concepts	Medical imaging
Overview	Medical imaging is the technique of creating visual representation of the interior of a body for clinical analysis and medical interview.
Aim	Describes in details the X-ray and Computed Tomography ionizing medical imaging modalities. It also introduces medical image processing and image quality evaluation techniques. Introduce types of radiology and Physical and mathematical basics of computer tomography.
Learning Outcomes	Define the fundamentals of digital image processing Define the key factors that affect image quality List, define, and explain an ionizing imaging system and break it down into its components and physical principles, for each of the imaging modalities covered (X-ray

	Radiography and X-ray computed tomography) Describe basic components of the nuclear medicine imaging equipments such Gamma Camera, SPECT, and PET in addition to the image reconstruction techniques. Describe basic components of the non-ionizing medical imaging equipments such MRI and US Describe published scientific articles that relate to medical imaging and be able to communicate their understanding in a professional manner be able to search, read, understand, and articulate the contents of scientific articles in the field of medical imaging**.**
Units	Unit One; • Introduction to Digital Image Processing • Introduction to Medical Imaging and Computers in Medical Imaging Unit Two; • Diagnostic Radiographic Imaging • X-ray Computed Tomography Imaging – CT Unit Three; • LessonNuclear Medicine Imaging – NM
Readings	The Essential Physics of Medical Imaging by J.E. Bushberg, J.A. Seibert, E.M. Leidholdt JR, and J.M. Boone, Published 2nd Edition 2002 by Lippncott Williams &Wilkens.
Activities	Exercises and home works, 5 minutes seminars about certain subjects and discussions and quizzes.
Module 10; Radiation Therapy protection and safety	
Key Concepts	Radiation Therapy, protection, safety
Overview	There are three essential methods to minimize external

	exposure to radiation:- time, distance and shielding
Aim	Providing the students with basic principles and concepts of radiation protection and safety as well as radiation health and safety requirements of federal and state regulatory agencies. To identify students with the specific responsibilities of radiation therapies.
Learning Outcomes	Describe the basic principles and concepts of radiation protection and safety. Explain the radiation health and safety requirements of federal and state regulatory agencies. Discuss, examine and evaluate the radiation therapies. To become aware of safety precautions when using radiation and be familiar with the government agencies related to the radiation exposure limits.
Units	Unit One; Radioactivity and activity Unit Two; Safety doses. Unit Three; Radiation Safety and Radiation safety for X-Ray Units
Readings	Radiation safety training manual, class notes. Radiation safety handbook. Physics: A Handbook for Teachers and Students Ch.16, class notes.
Activities	Lectures, Exercises and home works, 5 minutes seminars about certain subjects and discussions and quizzes.
Module 11; Medical instrumentation	
Key Concepts	Medical instrumentation
Overview	Medical instrumentation deals with various systems of the human physiology, signals of biological origin obtained from these systems, biosensors, transducers, bio-electrodes

	used to acquire such signals, and amplifiers for measuring bio-potentials. Electrical safety of medical devices; measurements of the blood pressure, blood flow, respiratory system, laboratory equipment, medical imaging, and bioethics will also be discussed.
Aim	To learn the physiology of the human body and the Instrumentation related to Biomedical Systems. To introduce student to basic biomedical technology. So that student can understand, design and evaluate systems and devices that can measure, test and/or acquire biological information from the human body.
Learning Outcomes	0. Explain the importance and objectives of medical instruments and sensors in medicine and identify the underlying physics principles and relate them to mechanisms of a number of biomedical instruments. 1. Apply basic medical instruments principles to real world problems in clinical engineering, medical device design, and troubleshoot basic medical instrumentation. 2. Discuss the measurement of physiological parameters. **3.** Understand the concepts of Imaging System and Telemetry ad the various Therapeutic Equipments used in Medicine.
Units	Unit One; Basic concepts components of Biomedical system. Unit Two; Measurements of Physiological Parameters Imaging System and Telemetry. Unit Three; Assisting and Therapeutic Equipments.
Readings	1. Medical physics,M. Hollins,Ch.4

	2. Lesilie Cromwell, Fred J.Weibell,ErichA. Pfeiffer, ”Bio-Medical Instrumentatio and Measurements” II edition, Pearson Education,2002/PHI 3. R.S.Khandpur,”Handbook of Bio-Medical Instrumentation” Tata McGraw Hill Publishing Co.Ltd.2003.
Activities	Lectures, Exercises and home works, 5 minutes seminars about certain subjects and discussions and quizzes.

Jerash University

Course Syllabus

College: Science
Department: Biology

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 302222
Course Name: Economic Plants
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:302221

Course Description:

A survey of economically important plants and their products. The history of plant use, plants in folklore and medicine, fermentation and viticulture, domestication of plants, and forestry are the major topics covered. Chemical, structural and nutritional aspects of plant products are also discussed along with the importance of plant in facing global warming and their role in sustainable development.

Course Learning Objectives:

- To develop basic knowledge about the relationship between plants and people
- To have an idea on plant biology
- To know that plants are a source of food, fibers, beverages, medicine, toxic and wood and other products
- To understand the role of plants in the environment

Expected Course Outcomes:

The successful student must be able to understand that:

1. Angiosperms, also called flowering plants, supply humanity with the essentials of life.
2. All living organisms have the capacity to grow and reproduce, the ability to respond, the ability to evolve and adapt, a metabolism, an organized structure, and organic composition.
3. Plant systematic has its origins in the classical works of Theophrastus of ancient Greece, who is generally regarded as the Father of Botany.
4. Linnaeus, a Swedish botanist of the eighteenth century, is credited with the creation of the binomial, or scientific name.
5. The taxonomic hierarchy includes the major ranks: kingdom, division (phylum), class, order, family, genus, and species.
6. Biologists have wrestled with the concept of the species; the biological concept describes a species as a group of interbreeding populations, reproductively isolated from other populations.

7. Charles Darwin and his theory of evolution by natural selection irrevocably changed the way biologists viewed species.
8. Currently biologists accept the Six-Kingdom System of classification.
9. The Kingdom Planate contains land plants, which manufacture their own food through photosynthesis and retain a multicellular embryo within the female gametangium.
10. Some plants, such as mosses, hornworts, and liverworts, have a dominant gametophyte generation.
11. All vascular plants have a dominant sporophyte. Four divisions of vascular plants do not form seeds.
12. The seed plants are currently the dominant vegetation in the world.
13. The first human societies were based on a foraging lifestyle, gathering wild plants and hunting animals for food.
14. The archeological record indicates that, at least in some parts of the world, certain groups began to shift from the nomadic, foraging lifestyle to the sedentary one of agriculture.
15. The earliest agricultural settlements, approximately 11,500 years old, have been found in the Far East along the Yellow and Yangtze River valleys.
16. Domesticated plants and animals are genetically different from their wild relatives because they have been shaped by artificial selection.
17. Because domesticated plants have been modified greatly from their wild ancestors after thousands of years of artificial selection, it has often been difficult to pinpoint their area of origin.
18. Grasses are members of the family Phocaea.
19. Wheat is one of the most widely cultivated crops in the world and is one of the oldest domesticated plants.
20. Corn, a New World native, was the dietary staple of many Native American tribes before European explorers arrived in America.
21. Rice feeds more people worldwide than any other crop, and it is the only crop grown exclusively for human food.
22. Other economically important grains include rye, triticale, oats, barley, sorghum, and millet.
23. Legumes are members of the Fabaceae, or bean family, and include several important food crops: peas, beans, soybeans, and peanuts.
24. The high protein content of many legumes is due to their association with nitrogen-fixing bacteria in their roots.
25. Dozens of types of peas and beans are valued for their high protein content.
26. The peanut (Arachis hypogea) has a South American origin and is unusual in that the plant itself "plants" its seed pods in the soil.
27. The protein content of soybean (Glycine max) is one of the highest of all crops.
28. Legumes are also valued as forage crops and as "green manure" to enhance soil fertility.
29. The search for new crops has uncovered several relatively unknown legumes.
30. Many plants store large quantities of starch in underground structures that are modified stems or roots.
31. Native to the highlands of South America, the potato was the dietary staple of the ancient Incan civilization and was introduced to Europe in the sixteenth century.

32. Sweet potatoes are storage roots of a plant in the morning glory family and are unrelated to the white potato.
33. Cassava is a tuberous root that is another important starchy staple vital to the food supply of millions in the tropics.
34. Other underground crops include yams and taro, which are important staples in tropical areas, especially the South Pacific islands.
35. Approximately 20% of the world's population receives insufficient food to meet daily nutritional requirements.
36. The loss of genetic diversity in crop plants and their wild ancestors because of monocultural practices is a serious concern to plant breeders.
37. Sustainable agriculture is a movement away from the instability of current monocultural practices to a more environmentally sound approach in which crops are harvested without degradation to the environment.
38. Germplasm is the genetic information encoded within a plant; it is the raw material of the plant breeder, and without it, the creation of new varieties is impossible.
39. Although there are approximately 50,000 species of edible plants, only three domesticated crops provide over 50% of the calories from plants in the human diet.
40. Biotechnology is being used along with traditional breeding to develop high-yielding and disease resistant cultivars.
41. The first genetically engineered plant was approved for commercial marketing in 1994, and by 2001, 60% to 70% of the processed foods in U.S. markets contained at least one ingredient from a genetically modified plant.
42. Caffeine and caffeinelike alkaloids have a stimulating effect on the central nervous system.
43. Coffee is obtained from the seeds of Coffeaarabica, a tree native to Ethiopia.
44. Tea, made from dried tip leaves of Camellia sinensis, is the world's most popular beverage.
45. The seeds of Theobroma cacao are the source of both a beverage and a confection, cocoa and chocolate.
46. The kola tree, native to West Africa, is the source of a caffeine beverage that has been consumed increasingly since the twentieth century.
47. The characteristic scents of aromatic plants, such as herbs and spices, are due to volatile substances called essential oils, which can be extracted to obtain the essence of the plant.
48. The history of spices is the history of domination of the spice-rich lands by various European powers.
49. Herbs are usually the aromatic leaves of plants from temperate regions.
50. Herbal dyes were one of the main sources of color in the ancient world, replaced by synthetic dyes only in the latter half of the nineteenth century.
51. In addition to food and drink, plants furnish society with the raw materials to provide shelter, clothing, and paper.
52. Linen, made from bast fibers of flax (Linumusitatissimum), was the cloth of choice for many ancient civilizations.
53. Other bast fibers that have been used to make cloth are ramie, jute (burlap), and hemp.
54. Bark is another material that has been used to make cloth and paper.

55. Wood and wood products supply construction materials and fuel to much of the world population.
56. In industrialized nations, approximately 50% of the harvested wood goes into wood pulp, with the majority of pulp used in the manufacture of paper.
57. Bamboo is a treelike member of the grass family with a long history of use in construction, furniture, baskets, screens, carpets, paper, and food.
58. From the earliest civilizations, native plants have supplied medicinal compounds.
59. Alkaloids and glycosides have been identified as the therapeutically important components of most medicinal plants.
60. Digitalis, the primary treatment for several heart ailments, is derived from foxglove, a biennial in the snapdragon family.
61. Today, aspirin is purely synthetic, but it is based on traditional remedies from willow bark.
62. Quinine, the active alkaloid in the bark of Cinchona trees, has been used for centuries in the treatment of malaria.
63. In 1952, the alkaloid reserpine was isolated from the roots of Rauwolfiaserpentina, a plant used by Hindu healers for thousands of years.
64. The sap of Aloe vera contains several glycosides that are used to treat minor burns and cuts.
65. Ephedrine and pseudoephedrine, alkaloids from various species of Ephedra, are found in prescription and over-the-counter decongestants.
66. Active compounds from several plants have become standard treatment for various forms of cancer, and researchers continue to look for and develop new anticancer compounds.
67. The use of psychoactive plants in human society dates back millennia.
68. The opium poppy (Papaversomniferum) is the source of a milky latex from the green capsules that, when dried, becomes crude opium.
69. Heroin is a semisynthetic derivative of morphine and the most strongly addictive of all the opiates.
70. Marijuana (Cannabis sativa) has an equally long history as a hallucinogen in India.
71. Cocaine is derived from the leaves of the coca plant (Erythroxylum coca), a shrub native to South America.
72. The most addictive drug in widespread use is nicotine, the major alkaloid in tobacco (Nicotiana spp.), and native to the New World.
73. The use of peyote (Lophophorawilliamsii) has long been associated with sacred rituals of many Indian tribes in Mexico.
74. Poisonous and allergy plants are known to adversely affect the health of humans and other animals.
75. Many plants in the natural environment and those in the garden or house are poisonous.
76. White snakeroot, locoweed, Indian hellebore, and St. John’s wort are plants that have been implicated in the poisoning deaths of livestock.
77. Plants can cause mechanical injury by puncturing the skin via thorns, barbs, or spines.
78. Plant toxins have become an important source in the search for natural insecticides.

79. Allergies are hypersensitivity diseases caused by the immune system's response to harmless substances such as ragweed pollen or mold spores.
80. Pollen from ragweed plants is the most important cause of allergic rhinitis in North America.
81. In addition to pollen from ragweed, pollen from hundreds of seed plants is known to trigger respiratory allergies.
82. The most common cause of contact dermatitis is poison ivy, a widespread climbing shrub in North America.
83. Food allergies can produce gastrointestinal symptoms, dermatitis, hives, or respiratory symptoms.
84. The ecosystem is the functional unit of study of the environment.
85. Ecological niche is the functional role an organism plays in the ecosystem.
86. Biological magnification is the transfer and concentration of a toxic substance as it is passed along a food chain.
87. Human impact on the carbon cycle has resulted in the greenhouse effect, in which the buildup of CO2 acts as a heat trap warming Earth's lower atmosphere. Global warming is likely to cause a shift in agricultural regions and in the range of many species of plants and animals.
88. Ecological succession is the gradual progression of orderly and predictable changes that may occur in ecosystems over time. The end point of ecological succession is the climax community.
89. Biomes are large, terrestrial regions recognizable by their distinctive vegetation and animal life.
90. The strategy of extractive reserves is an attempt to preserve the tropical rain forest from destructive exploitation by developing economic markets for a renewable harvest of natural products such as natural rubber, chicle, Brazil nuts, and vegetable ivory.
91. Several methods of forest management are currently in practice: clear-cutting, strip-cutting, whole-tree harvesting, shelterwood, selective cutting, and short rotation.

Course Resources:

75. Text book; Plants and society by Levetin and McMahon, 4th, 2006

Part 3: Assignments, Course policies, and Grading Policy

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Final Exam	50%
Total	100%

Grading Policy: In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

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Classroom Protocol and Participation Guidelines: *Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.*

Part 4: Course Outline/Schedule

Week	Topic	Readings
1	Plants in Our Lives Plant Systematic and Evolution	Chapter 1 Chapter 8
2	Plant Systematic and Evolution Diversity of Plant Life	Chapter 8 Chapter 9
3	Origins of Agriculture	Chapter 11
4	The Grasses	Chapter 12
5	Legumes	Chapter 13
6	Starchy Staples and first exam	Chapter 14
7	Feeding A Hungry World	Chapter 15
8	Stimulating Beverages	Chapter 16
9	Herbs and Spices	Chapter 17
10	Materials: Cloth, Paper, and Wood	Chapter 18
11	Medicinal Plants and second exam	Chapter 19
12	Psychoactive Plants	Chapter 20
13	Poisonous and Allergy Plants	Chapter 21
14	Plant Ecology	Chapter 26
15	Plant Ecology	Chapter 26
16	Final exams	

Part 5: Course Modules

Module 1; BOTANICAL CONNECTIONS TO OUR LIVES	
Key Concepts	PLANTS, SOCIETY
Overview	Module 1 stresses the overall importance of plants in everyday life. The properties of life and an introduction to chemistry are

	included. Flowering and non-flowering plants, algae, and fungi are introduced. The diversity and applications of photochemicals is also presented.
Aim	To understand the importance of plants in our life
Learning Outcomes	The successful student must be able to understand that: 1. Angiosperms, also called flowering plants, supply humanity with the essentials of life. 2. All living organisms have the capacity to grow and reproduce, the ability to respond, the ability to evolve and adapt, a metabolism, an organized structure, and organic composition. 3. Nine elements (carbon, oxygen, hydrogen, nitrogen, potassium, magnesium, calcium, phosphorus, and sulfur) make up 99.5% of living matter.
Units	1. PLANTS AND HUMAN SOCIETY 2. FUNDAMENTAL PROPERTIES OF LIFE 3. CHEMISTRY OF LIFE
Readings	Chapter 1 IN THE TEXT
Activities	Group discussion Assignments Quizzes
Module 2; BOTANICAL PRINCIPLES	
Key Concepts	Plant Life, Botanical Principles
Overview	This module addresses basic botany. Chapters cover plant structure from the cellular level through the mature plant. Reproduction, including mitosis and meiosis and the life cycle of flowering plants, is discussed in a separate chapter. Other chapters cover genetics, evolution, plant physiology, plant

	systematics, and plant diversity. Some of the economic aspects of plants discussed in this unit are the importance of vegetables and fruits, the connection between sugar and slavery, plant essential oils and perfumes, phytoremediation, the applications of palynology, and species conservation.
Aim	To have a revision on systematic and evolution
Learning Outcomes	The successful student must be able to understand that: 1. Plant systematic has its origins in the classical works of Theophrastus of ancient Greece, who is generally regarded as the Father of Botany. 2. Linnaeus, a Swedish botanist of the eighteenth century, is credited with the creation of the binomial, or scientific name. 3. The taxonomic hierarchy includes the major ranks: kingdom, division (phylum), class, order, family, genus, and species. 4. Biologists have wrestled with the concept of the species; the biological concept describes a species as a group of interbreeding populations, reproductively isolated from other populations. 5. Charles Darwin and his theory of evolution by natural selection irrevocably changed the way biologists viewed species. 6. Currently biologists accept the Six-Kingdom System of classification. 7. The Kingdom Planate contains land plants, which manufacture their own food through photosynthesis and retain a multicellular embryo within the female gametangium.

	8. Some plants, such as mosses, hornworts, and liverworts, have a dominant gametophyte generation. 9. All vascular plants have a dominant sporophyte. Four divisions of vascular plants do not form seeds. 10. The seed plants are currently the dominant vegetation in the world.
Units	1. EARLY HISTORY OF CLASSIFICATION 2. HOW PLANTS ARE NAMED 3. TAXONOMIC HIERARCHY 4. THE INFLUENCE OF DARWIN'S THEORY OF EVOLUTION 5. THE SIX-KINGDOM SYSTEM 6. SURVEY OF THE PLANT KINGDOM
Readings	Chapters: 8, and 9 in the text book.
Activities	Group discussion Assignments Documentary films Quizzes
Module 3; PLANTS AS A SOURCE OF FOOD	
Key Concepts	Plants, Food
Overview	This module describes the major food crops. It begins with a chapter on the requirements for human nutrition and continues with a chapter on the origin of agriculture. Other chapters cover the grasses, the legumes, and starchy staples. The unit ends with a chapter on the Green Revolution, the loss of genetic diversity, the search for alternative crops, and the controversial development of transgenic crops.
Aim	Studying the use of different plant as food source

Learning Outcomes	The successful student must be able to understand that: 1. The first human societies were based on a foraging lifestyle, gathering wild plants and hunting animals for food. 2. The archeological record indicates that, at least in some parts of the world, certain groups began to shift from the nomadic, foraging lifestyle to the sedentary one of agriculture. 3. The earliest agricultural settlements, approximately 11,500 years old, have been found in the Far East along the Yellow and Yangtze River valleys. 4. Domesticated plants and animals are genetically different from their wild relatives because they have been shaped by artificial selection. 5. Because domesticated plants have been modified greatly from their wild ancestors after thousands of years of artificial selection, it has often been difficult to pinpoint their area of origin. 6. Grasses are members of the family Phocaea. 7. Wheat is one of the most widely cultivated crops in the world and is one of the oldest domesticated plants. 8. Corn, a New World native, was the dietary staple of many Native American tribes before European explorers arrived in America. 9. Rice feeds more people worldwide than any other crop, and it is the only crop grown exclusively for human food. 10. Other economically important grains include rye, triticale, oats, barley, sorghum, and millet. 11. Legumes are members of the Fabaceae, or bean family,

	and include several important food crops: peas, beans, soybeans, and peanuts. 12. The high protein content of many legumes is due to their association with nitrogen-fixing bacteria in their roots. 13. Dozens of types of peas and beans are valued for their high protein content. 14. The peanut (Arachis hypogea) has a South American origin and is unusual in that the plant itself "plants" its seed pods in the soil. 15. The protein content of soybean (Glycine max) is one of the highest of all crops. 16. Legumes are also valued as forage crops and as "green manure" to enhance soil fertility. 17. The search for new crops has uncovered several relatively unknown legumes. 18. Many plants store large quantities of starch in underground structures that are modified stems or roots. 19. Native to the highlands of South America, the potato was the dietary staple of the ancient Incan civilization and was introduced to Europe in the sixteenth century. 20. Sweet potatoes are storage roots of a plant in the morning glory family and are unrelated to the white potato. 21. Cassava is a tuberous root that is another important starchy staple vital to the food supply of millions in the tropics. 22. Other underground crops include yams and taro, which are important staples in tropical areas, especially the South Pacific islands.

	23. Approximately 20% of the world's population receives insufficient food to meet daily nutritional requirements. 24. The loss of genetic diversity in crop plants and their wild ancestors because of monocultural practices is a serious concern to plant breeders. 25. Sustainable agriculture is a movement away from the instability of current monocultural practices to a more environmentally sound approach in which crops are harvested without degradation to the environment. 26. Germplasm is the genetic information encoded within a plant; it is the raw material of the plant breeder, and without it, the creation of new varieties is impossible. 27. Although there are approximately 50,000 species of edible plants, only three domesticated crops provide over 50% of the calories from plants in the human diet. 28. Biotechnology is being used along with traditional breeding to develop high-yielding and disease resistant cultivars. 29. The first genetically engineered plant was approved for commercial marketing in 1994, and by 2001, 60% to 70% of the processed foods in U.S. markets contained at least one ingredient from a genetically modified plant.
Units	1. FORAGING SOCIETIES AND THEIR DIETS 2. AGRICULTURE: REVOLUTION OR EVOLUTION? 3. BREEDING FOR CROP IMPROVEMENT 4. THE GREEN REVOLUTION 5. GENETIC DIVERSITY 6. ALTERNATIVE CROPS: THE SEARCH FOR NEW FOODS

	7. BIOTECHNOLOGY
Readings	Chapters: 11, 12, 13, 14, and 15 in the text book.
Activities	Group discussion Assignments Documentary films Quizzes
Module 4; PLANTS PRODUCTS	
Key Concepts	Commercial Products, Plants
Overview	This module covers other crops that provide us with consumable products such as beverages, herbs and spices, and materials such as cloth, paper, and wood. The historical origin and societal impact of these crops are explored.
Aim	To understand the importance of plant products
Learning Outcomes	The successful student must be able to understand that: 1. Caffeine and caffeine like alkaloids have a stimulating effect on the central nervous system. 2. Coffee is obtained from the seeds of Coffee Arabica, a tree native to Ethiopia. 3. Tea, made from dried tip leaves of Camellia Sinensis, is the world's most popular beverage. 4. The seeds of Theobroma cacao are the source of both a beverage and a confection, cocoa and chocolate. 5. The kola tree, native to West Africa, is the source of a caffeine beverage that has been consumed increasingly since the twentieth century. 6. The characteristic scents of aromatic plants, such as herbs and spices, are due to volatile substances called essential oils, which can be extracted to obtain the essence of the plant.

	7. The history of spices is the history of domination of the spice-rich lands by various European powers. 8. Herbs are usually the aromatic leaves of plants from temperate regions. 9. Herbal dyes were one of the main sources of color in the ancient world, replaced by synthetic dyes only in the latter half of the nineteenth century. 10. In addition to food and drink, plants furnish society with the raw materials to provide shelter, clothing, and paper. 11. Linen, made from fibers of flax (Linumusitatissimum), was the cloth of choice for many ancient civilizations. 12. Other fibers that have been used to make cloth are ramie, jute (burlap), and hemp. 13. Bark is another material that has been used to make cloth and paper. 14. Wood and wood products supply construction materials and fuel to much of the world population. 15. In industrialized nations, approximately 50% of the harvested wood goes into wood pulp, with the majority of pulp used in the manufacture of paper. 16. Bamboo is a treelike member of the grass family with a long history of use in construction, furniture, baskets, screens, carpets, paper, and food.
Lessons	PHYSIOLOGICAL EFFECTS OF CAFFEINE COFFEE, TEA, and CHOCOLATE COCA-COLA: AN "ALL-AMERICAN" DRINK OTHER CAFFEINE BEVERAGES ESSENTIAL OILS HISTORY OF SPICES

	SPICES, and HERBS FIBERS WOOD ANDWOOD PRODUCTS PAPER and BAMBOO
Readings	Chapters: 16, 17, and 18
Activities	Group discussion Assignments Documentary films Quizzes
Module 5; PLANTS AND HUMAN HEALTH	
Key Concepts	Plants, Human Health
Overview	This module introduces students to the historical foundations of Western medicine, the practice of herbal medicine, and the chemistry of secondary plant products. Descriptions of the plants that provide us with medicinal products and psychoactive drugs are discussed. The unit also covers the ubiquitous poisonous and allergy plants in our environment.
Aim	To know the role of plants in the human health
Learning Outcomes	The successful student must be able to understand that: 1. From the earliest civilizations, native plants have supplied medicinal compounds. 2. Alkaloids and glycosides have been identified as the therapeutically important components of most medicinal plants. 3. Digitalis, the primary treatment for several heart ailments, is derived from foxglove, a biennial in the snapdragon family. 4. Today, aspirin is purely synthetic, but it is based on traditional remedies from willow bark.

	5. Quinine, the active alkaloid in the bark of Cinchona trees, has been used for centuries in the treatment of malaria. 6. In 1952, the alkaloid reserpine was isolated from the roots of Rauwolfiaserpentina, a plant used by Hindu healers for thousands of years. 7. The sap of Aloe vera contains several glycosides that are used to treat minor burns and cuts. 8. Ephedrine and pseudoephedrine, alkaloids from various species of Ephedra, are found in prescription and over-the-counter decongestants. 9. Active compounds from several plants have become standard treatment for various forms of cancer, and researchers continue to look for and develop new anticancer compounds. 10. The use of psychoactive plants in human society dates back millennia. 11. The opium poppy (Papaversomniferum) is the source of amilky latex from the green capsules that, when dried, becomes crude opium. 12. Heroin is a semisynthetic derivative of morphine and the most strongly addictive of all the opiates. 13. Marijuana (Cannabis sativa) has an equally long history as a hallucinogen in India. 14. Cocaine is derived from the leaves of the coca plant (Erythroxylum coca), a shrub native to South America. 15. The most addictive drug in widespread use is nicotine, the major alkaloid in tobacco (Nicotiana spp.), and native to the New World. 16. The use of peyote (Lophophorawilliamsii) has long

	been associated with sacred rituals of many Indian tribes in Mexico. 17. Poisonous and allergy plants are known to adversely affect the health of humans and other animals. 18. Many plants in the natural environment and those in the garden or house are poisonous. 19. White snakeroot, locoweed, Indian hellebore, and St. John's wort are plants that have been implicated in the poisoning deaths of livestock. 20. Plants can cause mechanical injury by puncturing the skin via thorns, barbs, or spines. 21. Plant toxins have become an important source in the search for natural insecticides. 22. Allergies are hypersensitivity diseases caused by the immune system's response to harmless substances such as ragweed pollen or mold spores. 23. Pollen from ragweed plants is the most important cause of allergic rhinitis in North America. 24. In addition to pollen from ragweed, pollen from hundreds of seed plants is known to trigger respiratory allergies. 25. The most common cause of contact dermatitis is poison ivy, a widespread climbing shrub in North America. 26. Food allergies can produce gastrointestinal symptoms, dermatitis, hives, or respiratory symptoms.
Units	1. HISTORY OF PLANTS IN MEDICINE 2. ACTIVE PRINCIPLES IN PLANTS 3. MEDICINAL PLANTS 4. NOTABLE POISONOUS PLANTS

	5. PLANTS THAT CAUSE MECHANICAL INJURY 6. INSECTICIDES FROM PLANTS 7. ALLERGY PLANTS
Readings	Chapters: 19, 20, and 21 in the text book.
Activities	Group discussion Assignments Documentary films Quizzes
Module 6; PLANTS AND THE ENVIRONMENT	
Key Concepts	Plants, Environment
Overview	This module is an introduction to the principles of ecology: the ecosystem, niches, food chains, biogeochemical cycles, and ecological succession. The major biomes of the world are discussed, with an emphasis on the economic value of certain desert plants and the strategy of extractive reserves in the rain forest. The problems associated with rising levels of the greenhouse gas CO_2 and the environmental consequences of global warming are addressed.
Aim	To understand the role of the plant in the ecosystem
Learning Outcomes	The successful student must be able to understand that: 1. The ecosystem is the functional unit of study of the environment. 2. Ecological niche is the functional role an organism plays in the ecosystem. 3. Biological magnification is the transfer and concentration of a toxic substance as it is passed along a food chain. 4. Human impact on the carbon cycle has resulted in the greenhouse effect, in which the buildup of CO2 acts as a

	heat trap warming Earth's lower atmosphere. Global warming is likely to cause a shift in agricultural regions and in the range of many species of plants and animals. 5. Ecological succession is the gradual progression of orderly and predictable changes that may occur in ecosystems over time. The end point of ecological succession is the climax community. 6. Biomes are large, terrestrial regions recognizable by their distinctive vegetation and animal life. 7. The strategy of extractive reserves is an attempt to preserve the tropical rain forest from destructive exploitation by developing economic markets for a renewable harvest of natural products such as natural rubber, chicle, Brazil nuts, and vegetable ivory. 8. Several methods of forest management are currently in practice: clear-cutting, strip-cutting, whole-tree harvesting, shelter wood, selective cutting, and short rotation.
Units	1. THE ECOSYSTEM 2. BIOGEOCHEMICAL CYCLING 3. ECOLOGICAL SUCCESSION 4. THE GREENWORLD: BIOMES
Readings	Chapter 26 in the text book.
Activities	Group discussion Assignments Documentary films Quizzes

Jerash University

Course Syllabus

College: Science
Department: Chemistry

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 301361
Course Name: Environmental chemistry
Class Hours: (Times & Days)
Classroom:(Number & Building)
Prerequisites:

✓ **Course Description:**

This course is pivoted at analysis of the environment, analysis of major and minor constituents in air, water, earth and living matter, sampling strategies. The course will discuss in details the importance of the environmental chemistry, basic properties of chemical, transformation and degradation of chemical pollutants in the environment, toxicity of the environmental pollutants, chemistry of water pollutants, chemistry of atmospheric pollutants and the best use of resources to reduce pollutants.

✓ **Course Learning Objectives**

- The course will introduce the student to the role and importance of the environmental chemistry.
- Knowing the basic properties of chemical.
- Transformation and degradation of chemical pollutants in the environment.
- Toxicity of the environmental pollutants.
- Chemistry of water pollutants.
- Chemistry of atmospheric pollutants.
- To know the relationship between pollutant and human

✓ **Expected Course Outcomes:**

The successful student will be able to

174. Understand what is meant by;
    - Environmental chemistry.
    - Elementary cycle.
2. Know the characteristics of the atmosphere.
3. Identify and solve problems related to sources of pollution.
    - Types and effects of water pollution.
    - Types and effects of air pollution.
    - Types and effects of soil pollution.
4. Understand and apply water treatment procedures.
5. Identify composition of solid wastes.

6. Use the chemical and physical instrumentation in environmental science.

✓ **Course Resources:**

76. Environmental Chemistry. By Stanley Manahan9th, 2009
77. Principles of environmental chemistry by J. Girard, Jones and Bartlett, Publisher.
78. Selected web sites.

Part 3: Assignments, Course policies, and Grading Policy

✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book.They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

✓ ***Grade Components:***

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
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Part 4: Course Outline/Schedule

Week	Topic	Readings
1	Introduction	Chapter 1
2	Concepts of elementary cycles	Chapter 1
3	Concepts of elementary cycles	Chapter 1
4	Characteristics of the atmosphere	Chapter 9
5	Water pollution	Chapter 7
6	Air pollution	Chapter 11,12
7	Soil pollution	Chapter 15
8	Waste water treatment	Chapter 8
9	Composition of solid waste	Chapter 15,16,19,20
10	Physical parameter relevant to water analysis.	Chapter 9,24

Week	Topic	Readings
11	Chemical parameters in water chemistry and analysis.	Chapter 9
12	Biochemical parameters in water chemistry and analysis.	Chapter 6,21
13	Chemical instrumentation in environmental science.	Chapter 10,25
14	Physical instrumentation in environmental science.	Chapter 10,27
15	Revision	
16	Final exams	

Part 5: Course Modules

Module 1; Natural cycles and atmospheric chemistry	
Key Concepts	Natural cycles, Atmospheric chemistry
Overview	The chemistry of elements is very useful to understand the environmental issues, the elementary cycles such as oxygen and carbon is one of the most important natural processes.
Aim	Elementary cycles and characteristic of atmosphere.
Learning Outcomes	Know the matter and matter cycles, and the composition of atmosphere.
Units	1: Matter and cycles of matter. 2: endogenic and exogenic cycles. 3: The carbon cycle.

	4: The nitrogen cycle. 5: The Oxygen cycle. 6:The phosphorus cycle. 7: The sulfur cycle. 8:The Oxygen cycle
Readings	Chapter 1
Activities	Group discussion. Quizzes.
Module 2; Sources, types and effects of environmental pollution	
Key Concepts	Environmental pollution, Water, air, and land pollution.
Overview	The demands of increasing population with the desire of most people for a higher material standard of living are resulting in worldwide pollution on a massive scale. Environmental pollution can be divided among the categories of water, air, and land pollution.
Aim	To study the definition of pollutants. To study the contaminants which are classified as pollutants? To study the sources of pollutants.
Learning Outcomes	1. Identification of the pollution of various spheres of the environment. 2. Try to solve the problems pose from technology and the solution it offers. 3. Adopt agricultural practices that have resulted in intensive cultivation of land. 4.
Units	1: elemental pollution. 2: heavy metals. 3: metalloids.

	4: inorganic species. 5: organically bound metals and metalloids. 6: organic pollutants.
Readings	Chapters: 1,8
Activities	Lectures Group discussion Quizzes
Module 3; Waste management	
Key Concepts	Waste management
Overview	The nature and sources of hazardous wastes and their environmental chemistry has been pointed as the major problem these days.
Aim	To deal with means for minimizing waste, utilizing material that might go into wastes, and treating and disposing of wastes.
Learning Outcomes	Apply environmental chemistry to hazardous waste management to develop measure by which chemical waste can be minimized, recycled, treated, and disposed.
Units	1: waste reduction and minimization. 2: Recycling. 3: physical methods of waste treatment. 4: chemical treatment. 5: photolytic reactions. 6: thermal treatment methods. 7: biodegradation of wastes.
Readings	Chapters: 15,16,19,20.
Activities	Lectures Group discussion

	Quizzes
Module 4; Water chemistry and analysis	
Key Concepts	Water chemistry
Overview	Globally, problems with quantity and quality of water supply remain and in some respects are becoming more serious. These problems include increased water use due to population growth, contamination of drinking water by improperly discarded hazardous wastes, and destruction of Wildlife by water pollution.
Aim	Understand Water treatment and analysis of elements.
Learning Outcomes	1. Identify sources, properties, and uses of Water. 2. Consider water in rivers, lakes, estuaries, oceans, and underground, as well as the phenomena that determine the distribution and circulation of chemical species in natural waters.
Units	1: water quality and quantity. 2: the properties of water, a unique substance. 3: the characteristics of bodies of water. 4: aquatic life. 5: gases in water. 6: water acidity and carbon dioxide in water. 7: alkalinity. 8: calcium and other metals in water.
Readings	Chapters: 2, 3, 6, 7.
Activities	Lectures Group discussion Quizzes
Module 5; Chemical and physical instrumentation in environmental sciences.	
Key Concepts	Chemical instrumentation in environmental sciences.

	Physical instrumentation in environmental sciences.
Overview	Scientists understanding of the environmental can only are as good as their knowledge of the identities and quantities of pollutants and other chemical species in water, air, soil and biological systems. Therefore state of the art techniques of chemical analysis are essential to environmental chemistry.
Aim	Consider the new and improves analytical technique that enable detection of much lower levels of chemical species and vastly increased data throughput.
Learning Outcomes	1. Apply general aspects of environmental chemical analysis. 2. Use major techniques that are used to determine a wide range of analyses.
Units	1: classical methods. 2: spectro photometric methods. 3: electrochemical methods of analysis. 4: chromatography. 5: mass spectrometry. 6: analysis of water samples. 7: automated water analyses.
Readings	Chapter 10,24,25,27
Activities	Lectures Group discussion Quizzes

Jerash University

Course Syllabus

College: Science
Department: Chemistry

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 301356
Course Name: Pollution and industrial safe
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:

Course Description:
This course studies of the fate of chemicals in the air, water, and soil, and their impact on human health and the natural environment. Topics will include water pollution and water treatment, greenhouse gases and ozone layer destruction, sources and management of hazardous wastes.

Course Learning Objectives:

- To know what are pollutants, the main types of environmental pollution, its sources and effects.
- Understand the chemistry and effects of acid rain.
- Understand the properties and chemistry of greenhouse gases.
- Global warming and its effects.
- The course will introduce the student to the meaning of pollution.
- The fate of chemicals in the air, water, and soil.
- The impact of chemicals on the human and the natural environment.
- Water pollution and water treatments.
- Greenhouse gases and their impact.
- Ozone layer and its functions.
- Depletion of ozone layer and its implications.
- Sources and management of hazardous wastes.

Expected Course Outcomes:

175. Understand the relationship between the environment and the chemistry.
176. Identify what the air pollution is?
177. Be familiar of greenhouse effect.
178. Determine the effect of Ozone depletion.
179. Define Smog.
180. Consider the effect of dissolved oxygen in water.
181. Identify types of water pollution and apply treatment process.
182. Identify types of soil pollution and apply treatment process.
183. Know how to deal with wastes.
184. Apply principles of Green chemistry.

Course Resources:

79. Chemistry of the environment, Bailey, R. A., 2002, Second Edition
80. Chemistry and man's environment (Fuller, Edward C).

81. Introduction to chemistry of the environment (Bailey, Ronald Albert)

Part 3: Assignments, Course policies, and Grading Policy

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Part 4: Course Outline/Schedule

Week	Topic	Readings
1	Introduction to environmental chemistry	Chapter 1
2	Air pollution	Chapter 2,6
3	Acid deposition	Chapter 11
4	Greenhouse effect	Chapter 3
5	Ozone depletion	Chapter 5
6	Smog	Chapter 5
7	Dissolved oxygen in water	Chapter 3,10
8	Water pollution and treatment	Chapter 9,11
9	Soil	Chapter 12
10	Waste	Chapter 16
11	Photochemistry	Chapter 4,5
12	Green chemistry	Chapter 13, 14

Week	Topic	Readings
13	Green chemistry	Chapter 13, 14
14	Green chemistry	Chapter 13, 14
15	Revision	
16	Final exam	

Part 5: Course Modules

Module 1; Environmental chemistry	
Key Concepts	Environment, chemistry
Overview	All the environmental issues are related directly to chemistry in one way or other, to know the pollutants types and the hazards concentration of the several types of molecules. The pollutants could be natural or manmade but its hazards are the same. It will cause the depletion of ozone layer
Aim	To know what the pollutants are.
Learning Outcomes	All the chemicals are pollutants at high concentration, but some of them are very toxic even at very low concentration, the student must differentiate between both types of pollutants as well as determining the reactions that cause the depletion of ozone layer.
Units	1: introduction to environmental chemistry. 2: greenhouse effect 3: Smog 4: Ozone depletion.

	5: photochemistry.
Readings	Chapters, 1,2,3,4,5,6
Activities	Lecturing Video films Group discussion Quizzes
Module 2; Water Pollution	
Key Concepts	Water, pollution
Overview	The most important issue now is water pollution, because of the huge reduction of drinking water sources recyclable water is very important for agriculture and industrial processes. To solve any type of problem it is important to know the type and hazards of the pollutants in water.
Aim	Water pollution and water treatment
Learning Outcomes	1. Identify water pollution, groundwater pollution, 2. Measure elements cause pollution; 3. Control pollution.
Units	1. Categories of pollution. 2. Ground water pollution. 3. Causes of pollution 4. Thermal pollution. 5. Transport and chemical reaction of water pollutants. 6. Measurements including sampling, chemical testing and physical testing. 7. Control of pollution. 8. Industrial waste water. 9. Agriculture waste water.
Readings	chapter 2,6,9,11,12

Activities	Lecturing Video films Group discussion Quizzes
Module 3; Soil Pollution	
Key Concepts	Soil pollution
Overview	Soil pollution comes from coal ash, sewage, pesticides and herbicides, it affects the health by several ways, and the student has to know the cleanup options.
Aim	Soil pollution and cleanup options
Learning Outcomes	1. Identify sources of the soil pollution 2. Apply cleanup options, 3. Combat health effects of this type of pollution.
Units	1: coal ash. 2: Sewage. 3: pesticides and herbicides. 4: health effects 5: cleanup options.
Readings	Chapter 12,16
Activities	Lecturing Video films Group discussion Quizzes

Jerash University

Course Syllabus

College: Science
Department: Mathematics

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 303211
Course Name: Principles in statistics
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:

Course Description:

This course is the prerequisite to higher courses in statistics and probability. An introduction to the fundamental principles of statistics, describing data, probability and probability distributions (discrete and continuous), estimation and testing hypotheses. An introduction to probability and statistics with emphasis on applications in forestry and environmental sciences. The course content will be limited to the fundamental of basic statistics and its applications.

Course Learning Objectives;

- To develop understanding and appreciation for the basic principles of the statistics and probability.
- To develop understanding for the probability, discrete probability distributions and continuous probability distributions.
- To prepare students for more advanced courses in statistics and probability.
- To provide students with knowledge necessary to help solve real problems, special using estimation and testing hypotheses techniques.
- To understand basic statistical techniques by looking at examples in environment, climate change, and sustainable development.

Expected Course Outcomes;

The successful student will be able to

185. Classify variables into several types, and how measurements or data are generated.
186. Describe data sets using dotplots, pie charts, bar charts, line charts, relative frequency histograms and stem and leaf plots.
187. Differentiate between univariate and bivariate data.
188. Use numerical measures to construct a mental picture of the data.
189. Know the measures of center, measures of relative standing and measures of variability.
190. Apply Tchebysheff'sTheorem and the Empirical Rule on different data.
191. Identify the possible relationships between the Bivariate data.
192. Describe the Bivariate data using scatterplots, side-by-side pie charts, side-by-side bar charts and stacked bar charts.
193. Using the probability as a statistical tool.
194. Create probability distributions that serve as models for discrete and continuous random variables.
195. Know the binomial probability distribution and use the tables of cumulative binomial probabilities.
196. Know the normal probability distribution and use the tables of standard normal distribution probabilities.
197. Differentiate between parameters and statistics.
198. Describe the behavior of sample statistics in repeated sampling
199. Estimating the population parameters.

200. Know the concept of a statistical test of hypothesis and use it in different applications.
201. Examine some more advanced statistical techniques that are dealt with more fully in environment, climate change, and sustainable development.

Course Resources:

82. Introduction to Probability and Statistics by William Mendenhall, Robert J. Beaver & Barbara M. Beaver, 13th ,2009. (*Textbook*)
83. Elementary Statistics, Step by Step Approach by Allan G. Bluman, 2007.*(Reference)*
84. Introduction to Statistics by J. S. Milton and J. J. Meteer. D. C. Health and Company, 1986. *(Reference)*
85.

Part 3: Assignments, Course policies, and Grading Policy

✓ **Exams:** There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.

✓ ***Grade Components:***

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

✓ **Grading Policy:** In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

- ✓ **Course Policies:** All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither gives nor receive unauthorized assistance.

- ✓ **Homework Assignments:** Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.

- ✓ **Late Policy:** The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.

- ✓ **Cheating:** Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.

- ✓ **Classroom Protocol and Participation Guidelines:** Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.

Part 4: Course Outline/Schedule

Week	Topic	Readings
1	Describing Data with Graphs	Chapter 1: 1.1, 1.2, 1.3
2	Describing Data with Graphs	1.4, 1.5
3	Describing Data with Numerical Measures	Chapter 2: 2.1, 2.2, 2.3, 2.4
4	Describing Data with Numerical Measures	2.5, 2.6, 2.7
5	Describing Bivariate Data	Chapter 3: 3.1, 3.2, 3.3, 3.4
6	Probability and Probability Distributions	Chapter 4: 4.1, 4.2, 4.3

Week	Topic	Readings
7	Probability and Probability Distributions	4.5, 4.6, 4.8
8	Several Useful Discrete Distributions	Chapter 5: 5.2
9	The Normal Probability Distribution	Chapter 6: 6.1, 6.2
10	The Normal Probability Distribution	6.3
11	Sampling Distributions	Chapter 7: 7.1, 7.2, 7.3
12	Sampling Distributions	7.4, 7.5, 7.6
13	Large-Sample Estimation	Chapter 8: 8.1, 8.2, 8.3
14	Large-Sample Estimation	8.4, 8.5
15	Large Tests of Hypotheses	Chapter 9: 9.1, 9.2, 9.3
16	Looking at examples in environment, climate change, and sustainable development.	

Part 5: Course Modules

Module 1; Statistics	
Key Concepts	Statistics
Overview	Statistics is a branch of mathematic. Many sets of measurements are samples selected from larger populations. Other sets constitute the entire population, as in a national census. Graphs are extremely useful for the visual description of a data set. It is better to use numerical

	measures to construct a mental picture of the data. Sometimes the data that are collected consist of observations for two variables on the same experimental unit.
Aim	To describe the data using the graphs and numerical measures
Learning Outcomes	1. Classify variables into several types, and how measurements or data are generated. 2. Use graphs to describe data sets. 3. Apply numerical measures to construct a mental picture of the data. 4. Identify the possible relationships between the Bivariate data.
Units	1: Describing data with graphs 2: Describing data with numerical measures 3: Describing Bivariate data
Readings	Chapters: 1, 2, 3
Activities	Lecturing Group discussion Quizzes
Module 2; Probability	
Key Concepts	Probability
Overview	How can you use sample data to draw conclusions about the sampled populations? The variables can be redefined as random variables, whose values depend on the chance selection of the elements in the sample. Using probability as a tool, you can create probability distributions that serve as models for discrete random variables, and you can describe these random variables using a mean and standard deviation. The discrete

	random variables are often used to describe the number of occurrences of a specified event in a fixed number of trials or a fixed unit of time or space. The normal probability distribution plays a central role in statistical inference.
Aim	Understand probability, discrete probability distributions and continuous probability distributions.
Learning Outcomes	1. Use probability as a statistical tool. 2. Create probability distributions that serve as models for discrete and continuous random variables. 3. Use the tables of cumulative binomial probabilities. 4. Use the tables of standard normal distribution probabilities.
Units	1: Probability and probability distributions 2: Several useful discrete distributions 3: The normal probability distribution
Readings	Chapters: 4, 5, 6
Activities	Lecturing Group discussion Quizzes
Module 3; Estimation and hypothesis testing	
Key Concepts	Estimation, hypothesis testing
Overview	The sample statistics are used to make inferences about the corresponding population parameters. The Central Limit Theorem and the sampling distributions play a key role in evaluating the reliability of the estimates. The sampling distributions of are used to construct large sample tests concerning the values of population parameters of interest to the experimenter.

Aim	To estimate the population parameters and make the statistical test of hypothesis.
Learning Outcomes	1. Differentiate between parameters and statistics. 2. Describe the behavior of sample statistics in repeated sampling. 3. Estimating the population parameters. 4. Apply the concept of a statistical test of hypothesis and use it in different applications.
Units	1: sampling distributions 2: large-sample estimation 3: large-sample tests of hypotheses
Readings	Chapters: 7, 8, 9
Activities	Lecturing Group discussion Quizzes
Module 4; Statistical Applications on Environment	
Key Concepts	Statistical applications, environment, climate change, and sustainable development.
Overview	An introduction to probability and statistics with emphasis on applications in forestry and environmental sciences. Includes methods of graphical analysis, introduction of common probability distributions, and hypothesis testing.
Aim	To apply basic statistical techniques at examples in environment, climate change, and sustainable development.
Learning Outcomes	Examine some more advanced statistical techniques that are dealt with more fully in environment, climate change, and sustainable development.
Units	Will be on statistics applications on environmental issues.
Readings	********

Activities	Lecturing (Mostly by students) Term papers Group discussion Quizzes

Jerash University

Course Syllabus

College: Science
Department: Mathematics

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 303335
Course Name: Statistical Methods

Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites: Probability Theorem (303335)

✓ **Course Description:**

This course is an introduction to some statistical inference concerning large-sample estimation, large-sample tests of Hypotheses, parameters of two populations, Regression and correlation, Experimental designs, Categorical data, and Nonparametric statistics. An introduction to probability and statistics with emphasis on applications in environment, climate change, and sustainable development. Includes methods of graphical analysis, introduction of common probability distributions, and hypothesis testing.

✓ **Course Learning Objectives:**

- To provide students with knowledge necessary to help solve real problems, special using estimation and testing hypotheses techniques.
- To provide students with knowledge necessary to differentiate between inference from small sample and inference from large sample.
- To provide the students with knowledge about the analysis of variance and the regression.
- To provide the students with knowledge about the nonparametric statistics including different tests.
- To understand statistical inference techniques by looking at examples in environment, climate change, and sustainable development.

✓ **Expected Course Outcomes;**

The successful student will be able to;

202. Describe the behavior of sample statistics in repeated sampling.
203. Estimating the population parameters.
204. Know the concept of a statistical test of hypothesis and use it in different applications.
205. Differentiate between inference from small sample and inference from large sample.

206. Justify the normality of the estimators using the central limit theorem.
207. Determine how the different experimental factors affect the average response using the analysis of variance technique.
208. Analysis of variance for linear regression.
209. Estimation and prediction using the fitted line.
210. Testing the usefulness of the linear regression mode.
211. Know methods for analyzing categorical data.
212. Comparing several multinomial populations.
213. A test of specified cell probabilities.
214. Comparing populations for the many types of data using several statistical tests.
215. Differentiate between parametric and nonparametric tests.
216. Apply different tests in different applications.
217. Examine some advanced statistical (statistical inference) techniques that are dealt with more fully in other forestry and the environmental sciences.

✓ **Course Resources:**

86. Introduction to Probability and Statistics by William Mendenhall, Robert J. Beaver & Barbara M. Beaver, 13th, 2009. *(Textbook)*
87. An Introduction to Statistical Methods and Data Analysis, R. Lyman Ott&Micheal T. Longnecker. *(Reference)*
88. Statistical Methods, George W. Snedecor&William G. Cochran. *(Reference)*
89. Statistical Methods, Rudolf J. Freund, Donna Mohr&William J. Wilson. *(Reference)*

Part 3: Assignments, Course policies, and Grading Policy

- ✓ ***Exams:*** *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

- ✓ ***Grade Components:***

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

- ✓ **Grading Policy:** In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

- ✓ **Course Policies:** All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither gives nor receive unauthorized assistance.

- ✓ **Homework Assignments:** Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.

- ✓ **Late Policy:** The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.

- ✓ **Cheating:** Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.

- ✓ **Classroom Protocol and Participation Guidelines:** Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.

Part 4: Course Outline/Schedule

Week	Topic	Readings
1	Large-Sample Estimation	Chapter 8: 8.1-8.4
2		8.5-8.9
3	Large-Sample Tests of Hypotheses	Chapter 9: 9.1-9.4
4	Large-Sample Tests of Hypotheses	9.5-9.7
5	Inference from Small Sample	Chapter 10: 10.1-10.5
6	Inference from Small Sample	10.6-10.8
7	The Analysis of Variance	Chapter 11: 11.1-11.4
8	The Analysis of Variance	11.5-11.8
9	The Analysis of Variance	11.9-11.12
10	Linear Regression and Correlation	Chapter 12: 12.1-12.4
11	Linear Regression and Correlation	12.5-12.8
12	Analysis of Categorical Data	Chapter 14: 14.1-14.4

Week	Topic	Readings
13	Analysis of Categorical Data	14.5-14.7
14	Nonparametric Statistics	Chapter 15: 15.1-15.5
15	Nonparametric Statistics	15.6-15.9
16	Looking at examples in environment, climate change, and sustainable development.	

Part 5: Course Modules

Module 1; Estimation and hypothesis testing	
Key Concepts	Estimation, hypothesis testing
Overview	The sample statistics are used to make inferences about the corresponding population parameters. The Central Limit Theorem and the sampling distributions play a key role in evaluating the reliability of the estimates. The sampling distributions of are used to construct large sample tests concerning the values of population parameters of interest to the experimenter.
Aim	To estimate the population parameters and make the statistical test of hypothesis.
Learning Outcomes	1. Describe the behavior of sample statistics in repeated sampling. 2. Estimate population parameters. 3. Apply the concept of a statistical test of hypothesis and use it in different applications. 4. Differentiate between inference from small sample

	and inference from large sample. 5. Justify the normality of the estimators using the central limit theorem.
Units	1: large-sample estimation 2: large-sample tests of hypotheses 3: Inference from Small Sample
Readings	Chapters: 8, 9, 10
Activities	Lecturing Group discussion Quizzes
Module 2; Analysis of Variance (ANOVA)	
Key Concepts	Analysis of Variance (ANOVA)
Overview	The quantity of information contained in a sample is affected by various factors that the experimenter may or may not be able to control. By measuring both y and x for each experimental unit, thereby generating bi-variate data, you can use the information provided by x to estimate the average value of y and to predict values of y for pre assigned values of x. Many types of surveys and experiments result in qualitative rather than quantitative response variables, so that the responses can be classified but not quantified. Data from these experiments consist of the count or number of observations that fall into each of the response categories included in the experiment.
Aim	To determine how the different experimental factors affect the average response.
Learning Outcomes	1. Determine how the different experimental factors

	affect the average response using the analysis of variance technique. 2. Practice Analysis of Variance for linear regression. 3. Apply estimation and prediction using the fitted line. 4. Test the usefulness of the linear regression mode. 5. Compare several multinomial populations. 6. Apply test of specified cell probabilities.
Units	1: the analysis of variance 2: linear regression and correlation 3: analysis of categorical data
Readings	Chapters: 11, 12, 14
Activities	Lecturing Group discussion Quizzes
Module 3; Nonparametric Statistics	
Key Concepts	Nonparametric Statistics methods
Overview	Some experiments generate responses that can be ordered or ranked, but the actual value of the response cannot be measured numerically except with an arbitrary scale that you might create. How can you analyze these types of data? When data do not appear to satisfy the normality assumption and similar assumptions, an alternative method of analysis can be used (nonparametric statistical methods).
Aim	To present several statistical tests for comparing populations for the many types of data
Learning Outcomes	1. Comparing populations for the many types of data using several statistical tests.

	2. Differentiate between parametric and nonparametric tests. 3. Apply different tests in different applications.
Lessons	Lesson 1: the nonparametric statistics
Readings	Chapter 15
Activities	Lecturing Group discussion Quizzes
Module 4; Statistical Applications in Climate Change	
Key Concepts	Statistical applications, Environment, Climate Change, and Sustainable development.
Overview	Statistical methods with emphasis on applications in forestry and environmental sciences. Includes methods of graphical analysis, introduction of common probability distributions, and hypothesis testing.
Aim	To understand statistical inference techniques by looking at examples in environment, climate change, and sustainable development.
Learning Outcomes	Examine some advanced statistical (statistical inference) techniques that are dealt with more fully in Climate Change and environmental sciences.
Units	Discussion
Readings	*********
Activities	Lecturing Group discussion Quizzes

Jerash University

Course Syllabus

College:
Department:

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 603116
Course Name: Climate Change and Sustainable Policy
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites: No prerequisites.

Course Description:

Climate change is increasingly recognized as a critical challenge to ecological health, human well-being and future sustainable development. The interaction between society and climate is among the important considerations pertinent to the quest of nations for sustainable development. This course tries to incorporate the developments in the domain of climate change with respect to human influences on climate, the consequences of climate change, climate change conventions and protocols and adjustment possibilities. The students will be enlightened with knowledge on the impact of climate change on terrestrial and aquatic ecosystems. The potential threats of climate change on sectors like agriculture, forest, fisheries, livestock and natural resources are detailed in the course. The students will be capacitated with the response options to the climate change like mitigation and adaptation strategies. This course focuses primarily on these two potential responses to climate change: mitigation and adaption. In the course students will engage in the major debates around options for dealing with the climate problem with an emphasis on both behavioral and technological aspects of the climate change problem. The critical issues on the relationship between climate policy and sustainable development will be discussed. The stakeholders and institutions that drive change toward climate change and sustainable development will be identified.

Course Learning Objectives:

- To provide knowledge to the students on Climate Change Science and challenges to Sustainable Development.
- To equip the students with appropriate tools and techniques for interpreting the impacts of climate change, and evaluating & implementing measures that reduce vulnerability of systems.
- To empower the students with the mitigation and adaptation strategies against climate change.
- To understand the critical issues on the relationship between climate policy and sustainable development.
- Identify major stakeholders and institutions that drive change toward climate change and sustainable development.

Expected Course Outcomes:

Upon completion of this course students will be able to:

218. Gain a general understanding of the issues of Climate Change and Sustainable Development.
219. Understand and critically assess the concepts of climate change and sustainability.
220. Understand and analyze how to address climate change and sustainability.
221. Understand and critically analyze methods for measuring sustainability and climate change initiatives.
222. Evaluate the effectiveness of sustainability and climate change policies.
223. Understand national policy needed to support climate change efforts.

Course Resources:

There is no single text for this course. Readings will come from a variety of articles, books and reports including reports on Climate Change and sustainability issues. The following may be helpful.

1. Archer, "The Perturbed Carbon Cycle."
2. Schneider, "What Is 'Dangerous' Climate Change?".
3. Forster et al., "Changes in Atmospheric Constituents and in Radiative Forcing."
4. Kolbert, "The Curse of Akkad."
5. Surowiecki, "Better and Better: The Myth of Inevitable Progress."
6. Pew, "The Causes of Global Climate Change."
7. Pacala and Socolow, "Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies."
8. Grübler, Technology and Global Change. Chapter on Technology Concepts and Definitions
9. Enkvist, Nauclér, and Rosander, "A Cost Curve for Greenhouse Gas Reduction."
10. Delucchi and Jacobson, "Providing All Global Energy with Wind, Water, and Solar Power, Part II: Reliability, System and Transmission Costs, and Policies."
11. Schneider et al., "Assessing Key Vulnerabilities and the Risk from Climate Change."
12. Morgan et al., "Why Conventional Tools for Policy Analysis Are Often Inadequate for Problems of Global Change."
13. Eakin and Luers, "Assessing the Vulnerability of Social-Environmental Systems."
14. Füssel and Klein, "Climate Change Vulnerability Assessments: An Evolution of Conceptual Thinking."
15. Stern, "The Economics of Climate Change."
16. Nordhaus, "ECONOMICS: Critical Assumptions in the Stern Review on Climate Change."
17. Pindyck, *Climate Change Policy: What Do the Models Tell Us?*.
18. **USEFUL WEBSITES**
90. United Nations (www.un.org)
91. World Bank (www.worldbank.org)\
92. World Health Organization (www.who.int/en)
93. www.climatecrisis.net.
94. www.climateinteractive.org.

Part 3: Assignments, Course policies, and Grading Policy

Exams: *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

Grade Components:

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

Grading Policy: In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

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Homework Assignments: Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.
Late Policy: The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.
Cheating: Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.

Classroom Protocol and Participation Guidelines: Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.

Part 4: Course Outline/Schedule

Week	Topic
1	Introduction to climate science, climate change, and sustainability relations.
2	Introduction to climate science, climate change, and sustainability relations.
3	Greenhouse Gas Cycles.
4	The Climate System / Climate Policy.
5	The Climate System / Climate Policy.
6	Overview of Climate Change Impacts and Vulnerability.
7	Overview of Climate Change Impacts and Vulnerability.
8	From Vulnerability to Adaptation.
9	From Vulnerability to Adaptation.
10	Economics of Carbon Mitigation.
11	Economics of Carbon Mitigation.
12	Carbon Policies.
13	Carbon Policies.
14	Economics of Carbon Mitigation.
15	Economics of Carbon Mitigation.
16	Revision and Final Exam.

Part 5: Course Modules

Module 1; Climate Science and sustainability	
Key Concepts	Climate, Climate Change, Sustainability
Overview	This module provides a general overview of climate science and climate change impacts, highlighting the current state of knowledge and remaining uncertainties about climate change and sustainable development.
Aims	1. To review of the syllabus, introduction, short discussion of climate science and climate change impacts and associated environmental problems. 2. To provide a basic understanding of the global cycles of greenhouse gases. 3. To provide a basic understanding of the workings of the global climate system. 4. To develop an understanding of the complexity surrounding the public debate on climate change and the role of science therein.
Learning Outcomes	224. Gain a general understanding of the issues of Climate Change and Sustainable Development. 225. Understand and critically assess the concepts of climate change and sustainability.
Units	1. Introduction to climate science, climate change, and sustainability relations. 2. Greenhouse Gas Cycles. 3. The Climate System / Climate Policy Discussion.
Readings	1. Archer, "The Perturbed Carbon Cycle." 2. Schneider, "What Is 'Dangerous' Climate Change?". 3. Forster et al., "Changes in Atmospheric Constituents and

	in Radiative Forcing." 4. Kolbert, "The Curse of Akkad." 5. Surowiecki, "Better and Better: The Myth of Inevitable Progress." 6. Pew, "The Causes of Global Climate Change."
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words. 5. Climate interactive exercise; this exercise is based on an interactive tool developed at MIT and available at www.climateinteractive.org
Module 2; Climate Change: Impacts, Vulnerability and Adaptation.	
Key Concepts	Impacts, Vulnerability, Adaptation
Overview	This module focuses on the Climate change wide-ranging effects on the environment, and on socio-economic and related sectors, including water resources, agriculture and food security, human health, terrestrial ecosystems and biodiversity and coastal zones. The module highlighted the actions to mitigate

	climate change and to adapt to its impacts.
Aims	1. To review the evidence regarding the types of impacts expected under different climate change scenarios. 2. To understand vulnerability as a conceptual framework for discussing and measuring climate change impacts. 3. To understand measures to be taken to face climate change negative impacts. 4. To understand measures to be taken to adapt to climate change. 5. To understand the concepts relating vulnerability to adaptation, the determinants of adaptive capacity, and planning for adaptation.
Learning Outcomes	226. Understand and analyze how to address climate change and sustainability. 227. Understand and critically analyze methods for measuring sustainability and climate change initiatives. 228. Adopt measures to face and to adapt to climate change negative impacts.
Units	1. Overview of Climate Change Impacts and Vulnerability. 2. From Vulnerability to Adaptation.
Readings	1. Schneider et al., "Assessing Key Vulnerabilities and the Risk from Climate Change." 2. Morgan et al., "Why Conventional Tools for Policy Analysis Are Often Inadequate for Problems of Global Change." 3. Eakin and Luers, "Assessing the Vulnerability of Social-Environmental Systems." 4. Füssel and Klein, "Climate Change Vulnerability Assessments: An Evolution of Conceptual Thinking."

Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words.
Module 3; Carbon Management	
Key Concepts	Greenhouse Gas, Technology**,** Energy

Overview	Carbon management is at the heart of tackling climate change and has rapidly become a central part of the global business environment. As businesses and organizations become more conscious of environmental risks, carbon management gains a more crucial role in performance management, as well as corporate social responsibility (CSR). By tracking their carbon footprint, or the overall impact they have on the global climate in terms of the total amount of greenhouse gases produced, businesses and organizations are making noticeable improvements. Carbon management allows companies to recognize areas for reduction in emissions and potential energy efficiency projects. This module provides a broad and integrated understanding of carbon management.
Aims	1. Learning the fundamentals of technological change and an overview of the technical options for Greenhouse Gas (GHG) reduction. 2. To provide an overview of long-term energy modeling and its limitations.
Learning Outcomes	• Practicing the mitigation and adaptation strategies against climate change. • Clear identification of the climate policy and sustainable development. • Urge major stakeholders and institutions to drive change toward climate change and sustainable development.
Units	1. Technological Change and Understanding Technology Options. 2. Modeling Energy Futures.
Readings	1. Pacala and Socolow, "Stabilization Wedges:

	Solving the Climate Problem for the Next 50 Years with Current Technologies." 2. Grübler, Technology and Global Change. Chapter on Technology Concepts and Definitions 3. Enkvist, Nauclér, and Rosander, "A Cost Curve for Greenhouse Gas Reduction." 4. Delucchi and Jacobson, "Providing All Global Energy with Wind, Water, and Solar Power, Part II: Reliability, System and Transmission Costs, and Policies."
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words.
Module 4; Carbon Economics	
Key Concepts	Carbon Mitigation, Carbon Economics,
Overview	Carbon plays an important role in energy generation and thus functioning of the entire world. With its growth, carbon has brought about higher pollution and global warming. As a result, the world today is trying to reach a future in which the amount

	of carbon used (the carbon footprint) is less**.**
Aims	1. To review the evidence regarding the costs and benefits of carbon mitigation and the methodological issues surrounding models and cost estimates, as well as, issues around pricing carbon. 2. To review some issues (at various scales) that impacts the ability of societies to take action on climate change. 3. To discuss policy options and realities related to carbon economics.
Learning Outcomes	229. Evaluation of the effectiveness of sustainability and climate change policies. 230. Understand national policy needed to support climate change efforts.
Units	1. Economics of Carbon Mitigation. 2. Carbon Policies.
Readings	1. Stern, "The Economics of Climate Change." 2. Nordhaus, "ECONOMICS: Critical Assumptions in the Stern Review on Climate Change." 3. Pindyck, *Climate Change Policy: What Do the Models Tell Us?*.
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in

	terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words.

Jerash University

Course Syllabus

College:
Department:

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 601115
Course Name: Environmental science
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites: No prerequisites.

Course Description:

The environment impacts our way of life in many aspects (e.g., food and fiber production, resources for building shelter and infrastructure, water supplies, etc.). Adverse impacts to this environment affect the well-being of humans and other living organisms. Therefore, it is essential that students understand natural environmental systems, physical and social causes of environmental problems, and strategies to mitigate or manage these issues. The goal of the course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, to examine alternative solutions for resolving and/or preventing them. Environmental Science is an interdisciplinary subject which draws on the content of several disciplines to offer a balanced scientific and holistic perspective of environmental issues. It provides knowledge, skills and attitudes to identify, prevent and solve environmental problems and thereby prepares students for ultimate careers in diverse fields of relevance to environmental management and to sustainable development. This course provides a specific knowledge base of the environment and which facilitates the development of related skills and attitudes.

Course Learning Objectives:

- Stimulate interest in the environment
- Develop an understanding of the interdisciplinary and holistic nature of the environment.
- Develop knowledge and understanding of environmental issues and principles and the ability to apply these to environmental management.
- Develop the ability to collect, collate, analyze and interpret environmental data and to communicate environmental information and ideas logically.

- Provide an understanding of interactions between people and the environment.
- Increase an awareness of the importance of living in harmony with the environment.
- Recognize and evaluate the socio-economic, political and ethical issues in Environmental Science.
- Foster positive attitudes, values and commitment to identify, solve, and prevent environmental problems.
- Develop an understanding of how natural resources and the environment affect quality of life and the quest for sustainable development.

Expected Course Outcomes:

Upon completion of this course students will be able to:

1. Define terms and concepts related to environment.
2. Analyze and discuss different environmental situations.
3. Evaluate and justify options (for the use of resources).
4. Compare and contrast alternative solutions to environmental problems.
5. Select techniques and methodologies appropriate to different environmental situations.
6. Suggest possible solutions to specific environmental problems.
7. Draw inferences from environmental data.

Course Resources:

Required Text:

Friedland, Andrew, et al. 2012, Environmental Science. New York, NY: W.H. Freeman and Company.

Review books;

1. Raven, P.H., and L.R. Berg. 2006. Environment. 6th Edition. John Wiley & Sons, Hoboken, N.J. Sold at the University Bookstore.
2. Barron A., Environmental Science, 2013, 5th ed. by Thorpe, Gary.
3. Withgott and Scott Brennan. 2011. Environment: The Science behind the Stories 4th edition, by Jay, Pearson/Benjamin Cummings, New York. (ISBN: 978-0-321-71534-0). An electronic version of the book is available for purchase at http://www.mypearsonstore.com/.
4. Cunningham, W.P., Cunningham, M.A. & Saigo, B. 2000. Environmental Science, a Global Concern. (8th edition). McGraw-Hill (Boston).
5. G. Tyler Miller Jr. and Scott E. Spoolman.2012. Living in the Environment 17th edition, Brooks/Cole Cengage Learning.
6. Nebel, B.J. & Wright, R. 2005. Environmental Science: Toward a Sustainable Future. Prentice-Hall.
7. Raven, Peter H., Linda R. Berg and David M. Hassenzahl. 2010. Environment, 8th Edition. John Wiley and Sons.Inc.

8. **USEFUL WEBSITES;**
   - www.redlist.org/info/captions
   - www.biomeso.net
   - www.bagheera.com/
   - www.isleroyalewolf.org/ann_rep_pdf/ISRO_annrep07-08.pdf
   - www.hippocampus.org/AP%20Environmental%20Science
   - www.runet.edu/~swoodwar/CLASSES/GEOG235/biomes/main.html
   - www.wri.org/wri/biodiv
   - www.earthwatch.org
   - www.canari.org
   - http://cavehill.uwi.edu/cermes/CLMEPub/ENG/Brochure_Eng.
   - www.panda.org
   - www.imo.org/safety/mainframe

Part 3: Assignments, Course policies, and Grading Policy

***Exams**: There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

***Grade Components**:*

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

Grading Policy: In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

Course Policies: All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither gives nor receive unauthorized assistance.

Homework Assignments: Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.

Late Policy: The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.

Cheating: Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.

Classroom Protocol and Participation Guidelines: Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.

Part 4: Course Outline/Schedule

Week	Topic
1	Introduction to Environmental science, Our Earth
2	Environmental Systems

Week	Topic
3	Biological populations and communities, Ecological niches,
4	Interactions among species and species diversity,
5	Ecological pyramids,
6	Biodiversity and Loss of biodiversity,
7	Natural biogeochemical cycles
8	Water and Land Resources
9	Feeding the World
10	Nonrenewable Energy Sources
11	Achieving Energy Sustainability
12	Human Health and Environmental Risks
13	Global Change
14	Pollution and Atmospheric Change
15	Sustainability, Economics, and Equity
16	Revision and Final Exam.

Part 5: Course Modules

Module 1; Environmental Science	
Key Concepts	Environmental Science, Environmental Systems,
Overview	Environmental Science focuses on the application of biological, chemical, and physical principles to the study of the physical environment and the solution of environmental problems, including subjects such as abating or controlling environmental pollution and degradation; the interaction between human society and the natural environment; and natural resources management.
Aims	1. Develop an understanding of environmental science. 2. Provide the knowledge needed to make informed

	decisions regarding environmental issues. 3. Learn to make positive impacts on the environment.
Learning Outcomes	1. Understand the natural environment and its relationships with human activities. 2. Characterize and analyze human impacts on the environment. 3. Integrate facts, concepts, and methods from multiple disciplines and apply to environmental problems.
Units	4. Introduction to Environmental science, 5. Our Earth 6. Environmental Systems
Readings	• Text book, chapter 1 & 2 • Raven, P.H., and L.R. Berg. 2006. Environment. 6th Edition. John Wiley & Sons, Hoboken, N.J. Sold at the University Bookstore - chapter 1. • The recommended Websites.
Activities	6. Conduct study visits, to identify species diversity. 7. Visit to an ecosystem to identify and quantify human use of its components. 8. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 9. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures.

	10. For each unit the students will submit an individual reflection paper of approximately 1000 words.
Module 2; The Living World.	
Key Concepts	Populations, Species, Ecosystems, Biogeochemical cycles, Biodiversity
Overview	This module will assess on the fact that the earth is one interconnected system**.** The living world on earth plays a critical role in environmental issues. Environmental problems have a cultural and social context, and human survival depends upon developing practices that achieve sustainable systems.
Aims	1. To understand the basic ecological concepts; 2. To understand the processes that govern the interactions of organisms with the biotic and abiotic components of their environment; 3. To differentiate between key ecological terms and concepts; 4. To outline the importance of biogeochemical cycles; 5. To analyze the relationship between species diversity and ecosystem stability;
Learning Outcomes	• Identifying factors affecting population growth in a natural ecosystem; • Evaluating human interactions within natural ecosystems; • Investigating at least one ecosystems in a territory

Units	1. Biological populations and communities, 2. Ecological niches, 3. Interactions among species and species diversity, 4. Ecological pyramids, 5. Biodiversity, 6. Natural biogeochemical cycles 7. Loss of biodiversity,
Readings	• Text book, chapter 3,5, & 6 • Barron A., Environmental Science, 2013, 5th ed. by Thorpe, Gary. • Withgott and Scott Brennan. 2011. Environment: The Science behind the Stories 4th edition, by Jay, Pearson/Benjamin Cummings, New York. (ISBN: 978-0-321-71534-0). An electronic version of the book is available for purchase at http://www.mypearsonstore.com/.
Activities	5. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 6. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 7. Field visits. 8. The students will also be asked to write critical summaries on the lectures content

Module 3; Natural Resources	
Key Concepts	**Natural Resources.**
Overview	Our natural resources are our assets whose prudent and sustainable use is necessary for the well being of humans and other living other organisms. Unfortunately, the continuous and ever increasing demand for basic items of survival and technological developments have caused us to explore and exploit all possible natural resources. As individuals we tend to consume resources without giving a thought to conservation or harmful impact of over use or careless consumption.
Aims	1. To be aware of the major 'natural resources'. 2. To understand the factors affecting natural resource use and the environmental impacts of their use. 3. To be aware of measures and tools available for sustainable use and conservation of natural resources. 4. To understand the value of natural resources. 5. To understand the concept of ecological sustainability and implications for natural resource use. 6. To understand the environmental impacts and threats to agricultural systems. 7. To understand environmental impacts of provision and the use of energy. 8. To explain the importance of energy to society. 9. To discuss various methods of energy conservation and improving efficiency.
Learning Outcomes	• Differentiating between renewable and non-renewable natural resources and exhaustible and inexhaustible resources. • Differentiate between the consumptive and non-

	consumptive use of natural resources. • Identifying the major categories of natural resources. • Evaluating factors affecting natural resource use. • Justifying the need for natural resource conservation. • Describing measures and tools available for natural resource management and conservation. • Adopt environmentally sustainable practices in agricultural systems. • Appreciate the advantages of using renewable energy sources. • Evaluate the use of renewable energy.
Units	1. Water Resources 2. Land 3. Feeding the World 4. Nonrenewable Energy Sources 5. Achieving Energy Sustainability
Readings	• Text book, chapter 7,8, & 10. • Withgott and Scott Brennan. 2011. Environment: The Science behind the Stories 4th edition, by Jay, Pearson/Benjamin Cummings, New York. (ISBN: 978-0-321-71534-0). An electronic version of the book is available for purchase at http://www.mypearsonstore.com/. • Cunningham, W.P., Cunningham, M.A. & Saigo, B. 2000. Environmental Science, a Global Concern. (8th edition). McGraw-Hill (Boston). • www.wri.org/wri/biodiv • www.earthwatch.org • www.canari.org

	• www.panda.org
Activities	5. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 6. Visits to or lectures by representatives of natural resource agencies. 7. The students will also be asked to write critical summaries on the lectures content. 8. For each unit the students will submit an individual reflection paper of approximately 1000 words. 9. View videos and slides of natural resource management activities and protected areas. 10. Invite guest lecturers to discuss issues in agriculture. 11. Conduct field trips to compare productivity of different farms. 12. Conduct research on renewable energy systems used in the country. 13. Invite guest lecturers to discuss renewable energy.
Module 4; Pollution of the Environment	
Key Concepts	Atmospheric Pollution, Water Pollution, Land Pollution, Noise pollution
Overview	Pollution is the introduction of contaminants into the natural environment that causes adverse change.[1] Pollution can take the form of chemical substances or energy, such as noise, heat or light. Pollutants, the components of pollution, can be either foreign substances/energies or naturally occurring contaminants. Forms of pollution, impacts, methods to deal with pollution, and pollution pathways will be discussed in this

	module.
Aims	1. To be aware of the major types and sources of pollution. 2. To understand the environmental impacts of pollution. 3. To understand the methods available for monitoring, analyzing and mitigating pollution and its environmental impacts. 4. To describe the various pathways of pollution in the ecosystem and the biosphere.
Learning Outcomes	• Outline causes of pollution. • Analyzing a methodology to determine the performance and cost of pollution control techniques. • Evaluating air quality management and analyzing the causes and effects of pollution. • Comparing the environmental effects of pollution on humankind, and the plant and animal kingdoms. • Contrasting how pollution is controlled through modern technology, pollution prevention and economics. • Classifying various air pollution control methods and the costs to implement those controls.
Units	1. Pollution and Atmospheric Change. 2. Global Change
Readings	G. Tyler Miller. 2007, Living in the Environment, 13th Edition; 1. Ch 19 Water Pollution 2. Ch 21 Solid and Hazardous Waste 3. Ch 17 Air and Air Pollution 4. Ch 18 Climate Change and Ozone Loss
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course

	examiner) and invited lecturers. 2. Assign students to investigate and categorize local pollution problems. 3. Assign students to conduct home audit for sources and categories of pollutants. 4. Assign students to monitor individual waste production on a weekly basis. 5. Conduct field studies on the collection and disposal of garbage. 6. Collect information on industries and their potential to produce pollution. 7. Conduct field studies on industries or factories and analysis of their processes with respect to developing waste reduction strategies. 8. The students will also be asked to write critical summaries on the lectures content. 9. For each unit the students will submit an individual reflection paper of approximately 1000 words. 10. Invite guest lecturers to discuss issues in pollution.

College: Agriculture
Department: Agricultural Economics and Extension

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 603372
Course Name: Environmental Economics
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:

Course Description:
At this course, analytical tools, particularly benefit-cost analysis, will be explained and applied to problems with environmental dimensions. This course will focus on the role of the environment in the theory and practice of economics. Criteria and strategies used in the development and implementation of environmental policies will be defined and summarized. the theory of externalities and market failure will provide the basis for applying microeconomic concepts to the study of environmental improvement. Theoretical and policy formulations will be pursued with respect to environmental management issues. The overall objective of this course is to consider the efficient and equitable use of society's scarce environmental resources. Use of these resources will be considered in this course from four perspectives: the market allocation, efficient allocations, equitable allocations, and government attempts to achieve a more efficient and equitable allocation. This course combines theoretical analysis with

discussions on specific environmental policies as applied to water, air pollution, energy, climate change, sustainability and human health issues.

Course Learning Objectives:

- Orient students with topics in Environmental Economics.
- Equipping students with economic methods and tools to analyze basic environmental issues.
- To apply economic theory to the study of environmental issues.
- To identify and critically evaluate alternative environmental policy instruments.
- To discuss the importance of economic theory in the allocation of scarce natural resources.
- To identify the underlying failures that give rise to environmental problems, and possible solutions to these problems.
- To assess the range of economic principles and theory used by economists to solve economic problems generic to the fields of environmental and natural resource economics.

Expected Course Outcomes:

By the end of the course students will;

231. Learn that environmental economics is a subset of economics concerned with the efficient allocation of environmental resources.
232. Learn that economic activity has an impact on the environment, which in turn, affects both welfare and the performance of the economy.
233. Analyze basic environmental issues with economic methods and tools.
234. Explain the principles of economics that are relevant to understanding how individuals make decisions about consumption and production activities.
235. Developed a sufficient basis in microeconomics to provide a foundation for their work on environmental issues.
236. Practice in using economic principles to solve relevant analytical problems related to environmental issues

Course Resources:

1. Aldy, J. E. and R. N. Stavins .2007. Architectures for Agreement: Addressing Global Climate Change in the Post-Kyoto World. Cambridge: Cambridge University Press;
2. A. H. Farghali. 2007. Environment and Sustainable Policy. Cairo University.
3. Baumol WJ, Oates W. 1988. The Theory of Environmental Policy, 2nd edn. Cambridge University Press, Cambridge.
4. Charles Kolstad, 2010. Environmental Economics. Oxford University Press, 1st edition 2000, or 2nd edition.
5. Field, Barry and Martha Field. 2009. Environmental Economics: An Introduction. 5 th ed. Boston: McGraw-Hill Irwin.
6. Fullerton D., and R. Stavins. "How do economists really think about the environment?"Published in Nature (1998) 395: 6701. Earlier version is available as RFF Discussion Paper 98-29, http://www.rff.org/Documents/RFF-DP-98-29.pdf
7. Keohane and Olmstead, 2007. Markets and the Environment (Island Press,)
8. Kolstad CD. 2011. Intermediate Environmental Economics, International 2nd edn.Oxford University Press, Oxford.
9. Matthew Kahn, Fundamentals of Environmental Economics: Solving Urban Pollution Problems (Kindle Edition, available from Amazon.com at $2. The RFF Reader in Environmental and Resource Policy (Wallace Oates Editor, 2nd edition 2006, RFF Press.
10. Maslin, M., 2004. Global Warming: a Very Short Introduction. Oxford: Oxford University Press.
11. N. Hanley, J. F. Shogren and B. White.1997. Environmental Economics, In Theory and Practice. http://www.enviroliteracy.org/
12. Stern, N. (2007). The Economics of Climate Change: the Stern Review. Cambridge: Cambridge University Press;
13. Tientenberg, Tom and Lynne Lewis. 2009. Environmental & Natural Resource Economics. 8th ed. Boston: Pearson Addison Wesley.

Part 3: Assignments, Course policies, and Grading Policy

Exams: *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

Grade Components:

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%

Second Exam	20%
Final Exam	50%
Total	100%

Grading Policy: In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

Course Policies: All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to neither do their own work and neither gives nor receive unauthorized assistance.

Homework Assignments: Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.

Late Policy: The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.

Cheating: Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.

Classroom Protocol and Participation Guidelines: Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.

Part 4: Course Outline/Schedule

Week	Topics

Week	Topics
1	What is Environmental Economics?
2	Origins and scope of environmental economics.
3	Links between the economy and the environment.
4	Environmental Analysis.
5	Environmental policy instruments.
6	Environmental policy instruments.
7	Economics of Environmental Quality.
8	Environmental policy instruments.
9	Economics of environmental liability
10	economics of environmental liability
11	Environmental Impact Analysis
12	Environmental Impact Analysis
13	Regulatory Policy vs. Economic Incentives
14	Environment Protection laws in Jordan
15	The nature of climate problem, Mitigation Costs, Cost-Benefit Analysis
16	Final Exams' week

Part 5: Course Modules

Module 1; Economics and the Environment	
Key Concepts	Environment, Resources, Economics
Overview	This module will introduce students to the main concepts dealing with environmental economics. Environmental economics is the subset of economics that is concerned with the efficient allocation of environmental resources; it takes into consideration issues such as the conservation and valuation of natural resources, pollution control, waste management and

	recycling.
Aims	1. Enhance students understanding of economics and environment relations. 2. Equipping students with economic methods and tools to analyze basic environmental issues.
Learning Outcomes	At the end of this module students will be able to: - Define environmental economics - Understand that economic activity has an impact on the environment.
Units	1. What is Environmental Economics? 2. Origins and scope of environmental economics. 3. Links between the economy and the environment.
Readings	1. Field, Barry C. and Martha K. Field. 2009. Environmental Economics, 5th edition. San Francisco, CA: McGraw-Hill. 2. A. H. Farghali. 2007. Environment and Sustainable Policy. Cairo University. 3. N. Hanley, J. F. Shogren and B. White.1997. Environmental Economics, In Theory and Practice. 4. http://www.enviroliteracy.org/
Activities	11. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 12. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change

	both in terms of policy as in terms of measures. 13. The students will also be asked to write critical summaries on the lectures content. 14. For each unit the students will submit an individual reflection paper of approximately 1000 words.
Module 2; Environmental Economic Analysis	
Key Concepts	Environment, Economic, Analysis
Overview	Economic analysis has a definite role to play in informing decision makers about the desirability of going ahead with an investment project designed to improve environmental quality. It is also important to use economic analysis to decide how far to go in preventing environmental damages caused by investment projects whose purpose is not purely environmental. This module will focus on the main aspects helping making those decisions to improve environmental quality.
Aim	The overall aim of this module is to make students understand the process of economical analysis regarding the environmental issues.
Learning Outcomes	At the end of this module students will be able to: - Design and evaluate environmental policies. - Use environmental policy instruments - Analyze basic environmental issues with economic methods and tools.
Units	1. Environmental Analysis. 2. Environmental policy instruments. 3. Economics of Environmental Quality.
Readings	1. Field, Barry C. and Martha K. Field. 2009. Environmental Economics, 5th edition. San Francisco, CA: McGraw-Hill.

	2. A. H. Farghali. 2007. Environment and Sustainable Policy. Cairo University. 3. N. Hanley, J. F. Shogren and B. White.1997. Environmental Economics, In Theory and Practice. 4. http://www.enviroliteracy.org/ 5. Keohane and Olmstead, 2007. Markets and the Environment (Island Press,) 6. Kolstad CD. 2011. Intermediate Environmental Economics, International 2nd edn. Oxford University Press, Oxford. 7. Matthew Kahn, Fundamentals of Environmental Economics: Solving Urban Pollution Problems (Kindle Edition, available from Amazon.com at $2. The RFF Reader in Environmental and Resource Policy (Wallace Oates Editor, 2nd edition 2006, RFF Press.
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words.

Module 3; Environmental Policy	
Key Concepts	Environment, Policy.
Overview	Environmental regulation in most countries has traditionally relied on command-and-control policies in which regulators – typically the government – set standards or limits and apply them uniformly to a broad category of sources. There are three types of command-and-control mechanisms that regulators can choose to implement: ambient, emissions, or technology standards. It is believed by many that the primary advantage of using command-and control mechanisms is that they provide a clear outcome. It is also comparatively simple to monitor fulfillment since regulators only have to make sure that the standard has been met.At this module, environmental policy and the causes of natural resources pollution and some solutions to this problem will be discussed.
Aim	Enhance students understanding of environmental policies and its uses.
Learning Outcomes	At the end of this module students will be able to: - Discuss environmental policies and regulations - Discuss the issue of resources pollution and suggests solutions.
Units	1. Criteria for Evaluating Environmental Policies. 2. Environmental policy instruments. 4. Economics of Environmental Quality. 3. Environment Protection laws in Jordan
Readings	1. Baumol WJ, Oates W. 1988. The Theory of Environmental Policy, 2nd edn. Cambridge University Press, Cambridge. 2. Charles Kolstad, 2010. Environmental Economics.

	Oxford University Press, 1st edition 2000, or 2nd edition. 3. A. H. Farghali. 2007. Environment and Sustainable Policy. Cairo University. 4. Fullerton D., and R. Stavins. 1998. "How do economists really think about the environment?"Published in Nature 395: 6701. Earlier version is available as RFF Discussion Paper 98-29. 5. http://www.rff.org/Documents/RFF-DP-98-29.pdf 6. Keohane and Olmstead, 2007. Markets and the Environment (Island Press,) 7. Kolstad CD. 2011. Intermediate Environmental Economics, International 2nd edn.Oxford University Press, Oxford.
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words.
Module 4; **Climate Change Economics**	

Key Concepts	Climate change, Economics
Overview	The Economics of climate is critical to our understanding of how best to address this difficult issue. Economic analyses play a critical role in consideration of climate change policies. Identifying, assessing and communicating the implications of economic uncertainty and knowledge gaps remain a major challenge – for example - in characterization of long-term technology change and valuation of non-market impacts. Climate Change Economics can provide an important forum to consider fundamental economic issues that will enhance understanding and improve climate policy deliberations.
Aim	1. Overview of the science of climate change. 2. Considering the economic implications of climate change.
Learning Outcomes	• Initial assessment of economic responses to climate risks and opportunities. • Develop an idea about costs and benefits of climate risks and adaptation to them. • Development of adaptive governance approaches to managing risk and uncertainty.
Units	1. The Nature of the Climate Problem. 2. Mitigation Costs. 3. Cost-Benefit Analysis.
Readings	1. Aldy, J. E. and R. N. Stavins (2007). Architectures for Agreement: Addressing Global Climate Change in the Post-Kyoto World. Cambridge: Cambridge University Press; 2. Maslin, M. (2004). Global Warming: a Very Short Introduction. Oxford: Oxford University Press. 3. Stern, N. (2007). TheEconomics of Climate Change: the Stern Review. Cambridge: Cambridge University Press;
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor

	(course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words.

Jerash University

Course Syllabus

College: Agriculture
Department: Agricultural Economics and Extension

Part 1: Instructor Information

Instructor Name:
Office Location:

Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 603352
Course Name: Resources Economics
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:

Course Description:

The course covers economic analysis of natural resource use and conservation, includes analyses of the use of fuel, forest, marine and biodiversity resources. This course introduces students to the principles, reasoning, and techniques required to set-up and solve allocation problems, under different social objectives. In this course, the economic tools developed are applied to renewable resources, exhaustible resources, water, pollution, marine resources, climate change, conservation planning, and other contemporary problems. This course aim to enhance students learning the basic principles and tools required to analyze natural and non-natural resource management problems. The overall objective of this course is evaluating natural resource use in terms of efficiency and sustainability, and designing regulations for correcting inefficient and unsustainable resource market.

Course Learning Objectives:

- Learn basic economic principles governing the allocation of various categories of scarce natural/environmental resources among competing uses
- Gain experience with basic analytical tools useful for applying these principles to real world allocation problems

Expected Course Outcomes:

237. Students will learn about renewable resources, exhaustible resources.
238. Students will be able to solve allocation problems, under different social objectives.

239. They will understand the relationship between climate change and economical resources.

Course Resources:

There is no required textbook. Various reading will be handed out during the semester. The following resources may be helpful;

1. Conrad, J. 1999. Resource Economics. Cambridge University Press.
2. Roger Perman, Yue Ma, James McGilvray, and Michael Common. 2003. *Natural Resource and Environmental Economics*, third edition. Pearson Addison Wesley.
3. Conrad, J. 1999. Resource Economics. Cambridge University Press.
4. http://dutraeconomicus.files.wordpress.com/2014/01/roger-perman-yue-ma-michael-common-david-maddison-james-mcgilvray-natural-resource-and-environmental-economics-3rd-edition-2003.pdf.
5. http://www.eolss.net/sample-chapters/c13/e6-29-04-07.pdf
6. http://glisaclimate.org/media/HRWC%20Natural%20Resources.pdf
7. http://www.fsl.orst.edu/lulcd/Publicationsalpha_files/Alig_2011_gtr837.pdf

Part 3: Assignments, Course policies, and Grading Policy

Exams: *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

Grade Components:

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

Grading Policy: In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

Course Policies: All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither gives nor receive unauthorized assistance.

Homework Assignments: Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.

Late Policy: The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.

Cheating: Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.

Classroom Protocol and Participation Guidelines: Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.

Part 4: Course Outline/Schedule

Week	Topics
1	Introduction to Resources Economics
2	Economic foundations for resources uses

Week	Topics
3	Ownership of Agricultural Lands
4	Ownership of Lands by Rent
5	Economical Return of Land
6	Fundamentals of renewable resource economics
7	Water Resources Water allocation, markets, pricing, and conservation
8	Human Resources
9	Resources Maintenance
10	Fundamentals of non-renewable resource economics Optimal Depletion, Fossil Fuels, Natural Gas, Mineral resources
11	Handling risk, uncertainty, and sensitivity
12	Non-renewable resources and stock pollutants: dynamics and regulation
13	Ecosystem services and Ecosystem Based Management
14	The impact of climate change on natural resources - Ecological and Behavioral Responses of Wildlife to Climate Change - Impacts of Climate Change on Wildlife Habitat
15	Continuation
16	Final Exam

Part 5: Course Modules

Module 1; Modeling, Definitions, and Resource Allocation	
Key Concepts	Resources Economics, Resources
Overview	Economics has long been concerned with the efficient use of its scarce natural resources. At the start of the twentieth-century, economics started to

	treat natural resources as something more distinct than just as a free factor of production. Today, natural resource economics continues to expand on these early insights by developing theories that help explain how people and societies choose to manage and use their limited resources, both non-renewable resources like minerals and fossil fuels, and renewable resources like fisheries and forests. This module will introduce students to the definition of economical resources and its distribution and importance.
Aim	Enhance students understanding of resources economics.
Learning Outcomes	At the end of this module students will be able to: 95. Know the definition of resources economics. 96. Identify renewable and non-renewable resources.
Units	1. Introduction to Resources Economics 2. Economic foundations for resources uses 3. Ownership of Agricultural Lands 4. Ownership of Lands by Rent 5. Economical Return of Land
Readings	1. Roger Perman, Yue Ma, James McGilvray, and Michael Common. 2003. *Natural Resource and Environmental Economics*, third edition. Pearson Addison Wesley. 2. Conrad, J. 1999. Resource Economics. Cambridge University Press. 3. http://www.eolss.net/sample-chapters/c13/e6-29-04-07.pdf
Activities	15. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 16. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 17. The students will also be asked to write critical summaries on the

	lectures content. 18. For each unit the students will submit an individual reflection paper of approximately 1000 words.
Module 2; Renewable Resource Economics	
Key Concepts	Renewable resources
Overview	A renewable resource is a natural resource, such as fisheries and forests, which can replenish with the passage of time, either through biological reproduction or other naturally recurring processes. Renewable resources are a part of earth natural environment and the largest components of its ecosphere. Renewable resources may be the source of power for renewable energy. However, if the rate at which the resource is consumed exceeds its renewal rate, renewal and sustainability will not be ensured. The term renewable resource also describes systems like sustainable agriculture and water resources. Sustainable harvesting of renewable resources (i.e., maintaining a positive renewal rate) can reduce air pollution, soil contamination, and land degradation. Economic theory suggests an efficient harvest should balance the marginal benefits one can get elsewhere in the economy with the extra growth of the resource and the cost savings from not harvesting the resource. This module will focus on getting this resources and the importance of saving renewable resources from depletion.
Aim	The overall aim of this module is to enhance students' knowledge about renewable resources and its efficient uses.
Learning Outcomes	At the end of this module students will be able to: 1. Identify renewable resource. 2. Use resources efficiently.
Units	1. Fundamentals of renewable resource economics. 2. Water Resources. 3. Water allocation, markets, pricing, and conservation.

	4. Human resources
Readings	1. Perman, R., Ma, Y., McGilvray, J and Common, M (2003). Natural Resource and Environmental Economics. 3rd edition, 2. Roger Perman, Yue Ma, James McGilvray, and Michael Common. 2003. *Natural Resource and Environmental Economics*, third edition. Pearson Addison Wesley. 3. http://www.eolss.net/sample-chapters/c13/e6-29-04-07.pdf
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words.
Module 3; Non-renewable Resource Economics	
Key Concepts	Non-renewable resources
Overview	A non-renewable resource (also called a finite resource) is a resource that does not renew itself at a sufficient rate for sustainable economic extraction in meaningful human time-frames. Such resources will eventually be exhausted which include the fossil fuels, such as coal, oil, and natural gas; and mineral resources, such as iron ore and gold. This module focuses on the economic theory of efficient extraction, measures of resource scarcity, and energy supply and demand.
Aim	The aim of this module is to enhance students' knowledge about non-

	renewable resources and its efficient uses.
Learning Outcomes	At the end of this module students will be able to: 1. Identify non renewable resource. 2. Use non renewable resources efficiently.
Units	1. Fundamentals of non-renewable resource economics 2. Optimal Depletion 3. Fossil Fuels 4. Natural Gas 5. Mineral resources 6. Non-renewable resources and stock pollutants: dynamics and regulation
Readings	1. Conrad, J. 1999. Resource Economics. Cambridge University Press. 2. Roger Perman, Yue Ma, James McGilvray, and Michael Common. 2003. *Natural Resource and Environmental Economics*, third edition. Pearson Addison Wesley. 3. http://dutraeconomicus.files.wordpress.com/2014/01/roger-perman-yue-ma-michael-common-david-maddison-james-mcgilvray-natural-resource-and-environmental-economics-3rd-edition-2003.pdf. 4. http://www.eolss.net/sample-chapters/c13/e6-29-04-07.pdf
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper

	of approximately 1000 words.
Module 4; Climate Change and Natural Resources	
Key Concepts	Climate Change, Resources.
Overview	Climate change may refer to a change in average weather conditions, or in the time variation of weather around longer-term average conditions. It was found that climate has impacts on natural resources and associated ecosystems, land use and values, and human communities. This Module will focus of the effect of climate change on natural resources and how to manage and reduce this effect.
Aim	Enhance students understanding of climate change and its impacts on natural resources.
Learning Outcomes	At the end of this module students will be able to be familiar with climate change impacts on natural resources and provide solutions.
Units	1. Ecosystem services and Ecosystem Based Management 2. Ecological and Behavioral Responses of Wildlife to Climate Change 3. Impacts of Climate Change on Wildlife Habitat
Readings	1. Perman, R., Ma, Y., McGilvray, J and Common, M (2003). Natural Resource and Environmental Economics. 3rd edition, 2. Roger Perman, Yue Ma, James McGilvray, and Michael Common. 2003. *Natural Resource and Environmental Economics*, third edition. Pearson Addison Wesley. 3. http://glisaclimate.org/media/HRWC%20Natural%20Resources.pdf 4. http://www.fsl.orst.edu/lulcd/Publicationsalpha_files/Alig_2011_gtr837.pdf
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are

	held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words.

Jerash University

Course Syllabus

College: Economics and Administrative Sciences

Department: Business Administration

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours:
Office Telephone:

E-mail:

Part 2: Course Information

Course Number: 206107
Course Name: Introduction to Economics
Class Hours:
Classroom:
Prerequisites:

Course Description:

This course is an introductory course that introduces you to basic economic concepts and rigorous applications and the economic way of thinking. You will also learn how to analyze government policy for the individual markets (MICROECONOMICS) and government policy at the national level (MACROECONOMICS), including fiscal and monetary policies. MICROECONOMICS topics will include market models of supply and demand, market structures and competition, efficiency, and equilibrium. MACROECONOMICS topics will cover the national economy models, measurement, economic growth, international trade and finance. The second module of this course, analyzes the effects of climate change on economy.

Course Learning Objectives:

1. Demonstrate intermediate knowledge of microeconomics/managerial economics. Intermediate microeconomics and managerial economics require students to analyze microeconomic problems and issues through an analytical and quantitative approach. Students will understand the theory of choice, cost analysis, resource allocation, and market structure.
2. Demonstrate intermediate knowledge of macroeconomic theory. Intermediate macroeconomics requires students to analyze macroeconomic problems and issues through an analytical and quantitative approach.
3. Demonstrate basic analytical and quantitative skills required to address economic questions. Students need to be at least at a beginning level in calculus to understand basic and applied economic theory. They also need an understanding of statistics that prepares them to use multivariable single regression models. Students should know how to apply these techniques to address basic economic questions. Other analytical skills also enhance the student's economic skill set and are taught in the appropriate field course.

4. Demonstrate an ability to effectively communicate the use of economic concepts and principles to address economic problems (especially current economic issues).
5. Understand the effects of climate change on economy.

Expected Course Outcomes:

1. Students should be equipped with some tools and methods of economic analysis that will serve as the basis for a more advanced course of study in microeconomic theory.
2. The non-specialist economics student should have a good introduction to the fundamental principles of microeconomics.
3. Both specialist and non-specialist economics students should be able to use the concepts to which they are introduced to facilitate analysis of the functioning of the micro-economy.

Course Resources:

1. Economics, 10th edition (2012), by Michael Parkin. Pearson Publisher.
2. Mankiw, N. Gregory (2009). Essentials of Economics (5th Edition).
3. Economics by Walter Wessels. Eleventh (3th) Edition. New York: Barron, 2000.
4. Climate Change Threatens Economic Growth-UN Report. How should Investors React?, available at: http://www.forbes.com/sites/mikescott/2014/04/03/climate-change-threatens-economic-growth-un-report-how-should-investors-react/

Part 3: Assignments, Course policies, and Grading Policy

***Exams**: There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

***Grade Components**:*

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%

Second Exam	20%
Final Exam	50%
Total	100%

Grading Policy: In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

Course Policies: All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither gives nor receive unauthorized assistance.
Homework Assignments*: Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.*

Late Policy*: The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.*

Cheating*: Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.*

Classroom Protocol and Participation Guidelines*: Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.*

Part 4: Course Outline/Schedule

Week	Topics
1	Introduction;

Week	Topics
	• Principles of Economics
2	Basic Concepts; • Principles of Economics
3	Basic Concepts; • Types of Economies
4	Basic Concepts; • Thinking like an Economist
5	Basic Concepts; • scarcity
6	Climate Change and Economy; • Climate Change • effects of climate change • effects of climate change on economy
7	Climate Change and Economy; • effects of climate change on economy
8	Utility**;** • Supply
9	Utility**;** • Demand
10	Utility**;** • Total Utility • Marginal Utility
11	Utility; • Diminishing marginal utility
12	Microeconomics; • Price determination

Week	Topics
	• Consumers behavior
13	Microeconomics; • Consumers behavior
14	Continuation
15	Evaluation and Assessment
16	Final Exams' week

Part 5: Course Modules

Module 1; Types and Principles of Economies	
Key Concepts	Traditional, Command, Market, Mixed, investment, individuals, consumers, government
Overview	Societies have developed different broad economic approaches to manage their resources. Economists generally recognize four basic types of economic systems—traditional, command, market, and mixed—but they don't completely agree on the question of which system best addresses the challenge of the scarcity of resources. Therefore, this module discusses theses types and negotiates the most efficient one.
Aim	This module aims to introduce the basic concepts and types of economics to the students. It also aims to address the challenge of scarcity and how individuals and nations face such limitations of their resources.
Learning Outcomes	By the end of this module, students will be able to: 97. Understand the different types of economies; 98. Learn examples of some countries that apply these types;

	99. Try to judge the best economic system in a modern society; 100. Differentiate between the traditional and the mixed economic system and show that the mixed one fits the modern society.
Units	1. Principles of Economics 2. Types of economies 3. Thinking like an Economist 4. scarcity
Readings	• Mankiw, N. Gregory (2009). Essentials of Economics (5th Edition).
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words. 5. firms' visits, **6.** reports, 7. Quizzes

Module 2; Climate Change and Economy	
Key Concepts	Climate Change, economy, global warming, environment, carbon dioxide, ecosystems
Overview	This module argues that climate change is having an impact on every ecosystem from the equator to the poles. It suggests that most effects of warming the climate are negative and will get worse. It talks of "extreme weather events leading to breakdown of…critical services such as electricity, water supply and health and emergency services" and it sounds the alarm about "the breakdown of food systems, linked to warming." Therefore, this module analyzes the effects of climate change on economy.
Aim	The aim of this module is to study the effects of climate change on the economy, individuals, nations, and ecosystems. It can cause harm to the coastal cities through expansion of water by heating, harm to seawater through absorption of carbon dioxide and many other problems and such problems can negatively affect the economy and destroy it.
Learning Outcomes	By the end of this module, students will be able to: 101. Realize the amount of danger and risk climate change has on economy and on the environment; 102. Put into analysis the problems climate change can cause to individuals, nations, and communities; 103. Realize that global warming can cause many extinctions; 104. Realize that it can cause diseases and poverty to humanity.
Units	1. Climate Change

	2. General effects of climate change 3. Effects of climate change on economy
Readings	• Climate Change Threatens Economic Growth-UN Report. How should Investors React?, available at: http://www.forbes.com/sites/mikescott/2014/04/03/climate-change-threatens-economic-growth-un-report-how-should-investors-react/
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words. **5.** Reports, 6. Quizzes
Module 3; Utility and Economics	
Key Concepts	Supply, demand, utility, marginal, diminishing marginal utility, satisfaction, addition
Overview	Underlying the laws of demand and supply is the concept of

	utility, which represents the advantage or fulfillment a person receives from consuming a good or service. Utility, then, explains how individuals and economies aim to gain optimal satisfaction in dealing with scarcity. This module studies types of utility and their relation to demand and consumption. The law of diminishing marginal utility helps economists understand the law of demand and the negative sloping demand curve. The less of something you have, the more satisfaction you gain from each additional unit you consume; the marginal utility you gain from that product is therefore higher, giving you a higher willingness to pay more for it. Prices are lower at a higher quantity demanded because your additional satisfaction diminishes as you demand more.
Aim	To be familiar with concepts of; Supply, demand, utility, marginal, diminishing marginal utility, satisfaction, addition
Learning Outcomes	By the end of this module, students will be able to: 105. Understand the meaning of utility and its relation to demand and supply principles; 106. Understand the meaning of total utility and marginal utility and the relationships between them; 107. Apply these concepts to the market available examples.
Units	1. Supply 2. Demand 3. Total Utility 4. Marginal Utility 5. Diminishing marginal utility
Readings	• Mankiw, N. Gregory (2009). Essentials of Economics (5th Edition).

Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words. 5. Reports, 6. Quizzes
Module 4; Microeconomics	
Key Concepts	Decision makers, behaviors, micro- level
108. Overview	This module studies the behavior of individuals and small impacting organizations in making decisions on the allocation of limited resources. Typically, it can be said to apply to markets where goods or services are bought and sold. Microeconomics examines how these decisions and behaviors affect the supply and demand for goods and services, which determines prices, and how prices, in turn, determine the quantity supplied and quantity demanded of goods and services. Such process plays a significant role in determining

	and keeping the balance in the market milieu.
109. Aim	This module aims to explain the meaning and application of microeconomics principles in the market. It reflects the freedom of the individual and private sector to play a role in the market supply and demand to make profits.
110. Learning Outcomes	By the end of this module, students will be able to: 111. Understand the principles of microeconomics; 112. Distinguish between micro-economics and macroeconomics; 113. Make connections between policy, market, and decision makers. 114. Understand the chain of economics; something is linked and will eventually affect the other principle of economics.
115. Units	1. Consumers behavior 2. Price determination
116. Readings	1. Economics, 10th edition (2012), by Michael Parkin. Pearson Publisher. 2. Mankiw, N. Gregory (2009). Essentials of Economics (5th Edition). 3. Economics by Walter Wessels. Eleventh (3th) Edition. New York: Barron, 2000.
117. Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the

	acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words. 5. Reports, 6. Quizzes

Jerash University

Course Syllabus

College:
Department:

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)

Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 102108
Course Name: Computer Skills
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites: No prerequisites.

Course Description:

This is an introductory course in basic computer use. It covers computer hardware and software fundamentals (including the use of Windows), key productivity applications (including word processing, spreadsheets, and presentations systems).In this course, students are introduced to a Windows-based operating system, the Internet, and to word processing, PowerPoint and spreadsheet applications. Students will learn basic computer concepts and terminology, use a personal computer, and develop competency in accessing, inputting, retrieving, storing, sending, and presenting information. Applications studied are Microsoft Windows, Word, Excel, PowerPoint, and Internet. Using computer models to understand Global Climate Change will be addressed in the last model of this course.

Course Learning Objectives:

1. Describe the parts of a computer.
2. Learn about computer hardware/software and develop working knowledge of computer terminology.
3. Identify and use window components.
4. Use the parts of the computer correctly.
5. Perform basic computer tasks in a Windows environment.
6. Navigate a webpage.
7. Perform basic file management tasks.

Expected Course Outcomes:

Upon completion of this course students will be able to:

1. Identify computer hardware and peripheral devices
2. Familiar with software applications
3. Practice file management
4. Accomplish creating basic documents, worksheets, presentations.
5. Distinguish the advantages and disadvantages of networks
6. Experience working with email and recognize email netiquette
7. Explore the Web and how to conduct research
8. Identify computer risks and safety
9. Use Windows desktop features, including managing files and directories.
10. Locate and organize information using a web browser.
11. Use a word processing package to draft, format, save and print memos, letters and reports.
12. Develop critical thinking skills in the use of information and communication technologies (ICT).
13. Employ self-directed strategies to learn new features of software packages and other technology.

Course Resources:

1. Bangia R., 2008. Computer Fundamentals and Information Technology. Firewall Media. New Delhi- India. 978-81-318-0296-0.
2. Bouwer, L. M., and others (2004). Adaptation and Funding in Climate Change Policies. In Kok and de Coninck:173-201.
3. Gupta, J. (1997). Th e Climate Change Convention and Developing Countries: From Confl ict to Consensus? Boston/London: Kluwer Academic Publ.
4. Heemst, J. van, and V. Bayangos (2004). Poverty and Climate Change. In: Kok M.T.J. and H.C. de Coninck, 2004: 21-52.
5. Michaelowa, A., and M. Dutschke (2000). *Climate Policy and Development: Flexible Instruments and Developing Countries*. Cheltenham, UK: Edward Elgar.
6. Munasinghe, M., and R. Swart (1999). Climate Change and its Linkage with Development, Equity and Sustainability. Proceedings of the IPCC Expert Meeting, Colombo, 27-29 April 1999. Paris: IPCC, WMO.
7. Williams B., 1995. Using Information Technology: A Practical Introduction to Computers & Communications. Irwin Publishing. Chicago- USA. ISSN 0-256-15350-7.

8. www. Climateprediction.net
9. Vermaat, M. Discovering Computers. 2010. Cengage Learning. Boston – USA. ISSN 978-0-495-80638-7.

Part 3: Assignments, Course policies, and Grading Policy

Exams: *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

Grade Components:

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

Grading Policy: In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

Course Policies: All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither gives nor receive unauthorized assistance.

Homework Assignments: Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.

Late Policy: The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.

Cheating: Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.

Classroom Protocol and Participation Guidelines: Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.

Part 4: Course Outline/Schedule

Week	Topic
1	Introduction, Computer Basics,
2	Hardware,
3	Windows,
4	File Management,
5	Word Processing
6	Spreadsheets
7	Spreadsheets
8	Spreadsheets
9	PowerPoint
10	PowerPoint
11	PowerPoint
12	Internet and Web Basics,
13	Internet and Web Basics,
14	Security and Protection,
15	Computer Maintenance,
16	Revision and Final Exam.

Part 5: Course Modules

Module 1; Computer Basics	
Key Concepts	Desktop computer, Keyboard, Mouse, Monitor, Software, Hardware.
Overview	The basics of computers set the foundation for everything else students are going to learn. Today it is often assumed that people know these basics, however in an introductory course it is good to ensure these basics are introduced.
Aims	4. Identify the basic parts of a desktop computer. 5. Identify different types of computers 6. Identify basic parts of the Windows operating 7. To handle mouse and keyboard basics. 8. To be customized with windows programs. 9. Identify computer hardware and peripheral devices. 10. To be familiar with software applications.
Learning Outcomes	Upon completion of this module students should be able to: 1. Be familiar with different types of computers. 2. Be familiar with basic parts of a desktop computer. 3. Be customized with windows programs. 4. Be familiar with software applications.
Units	7. Types of computers. 8. Parts of a desktop computer. 9. Peripheral devices. 10. Software & Hardware.
Readings	Bangia R., 2008. Computer Fundamentals and Information Technology. Firewall Media. New Delhi- India. 978-81-318-0296-0.

Activities	1. Identify each major part of a computer. 2. Describe the function of each part. 3. Discuss how to hold and use the mouse. 4. Discuss what students see on the desktop. 5. Show how to find and open typing program. 6. Show how to use typing lessons and games. 7. Use Microsoft Paint to show how to find, open and close a program, to identify the menu bar and icons and to practice with the mouse. 8. Close all programs and ask them to find and open Paint by themselves.
Module 2; Windows and File Management.	
Key Concepts	Window features, Menu bars, Tool bars, Task bar.
Overview	The term Windows collectively describes any or all of several generations of Microsoft operating system products. Windows allows you to organize folders and files in a file hierarchy, imitating the way you store paper documents in real folders. File management is organizing and keeping track of files and folders, helping you stay organized. Using the file management tools, you can save files in folders with appropriate names for easy identification, quickly and easily create new folders so you can reorganize information and delete files and folders that you no longer need. You can also search for a file when you cannot remember where you stored it, create shortcuts to files and folders for quick and easy access, and even compress files and folders to save space.
Aims	1. Understand what is meant by window. 2. Show windows features (minimize, resize, exit, click & drag). 3. Learn how to use the basic parts, tools and rules in the Windows environment; - Menu bar (drop down arrow). - Tool bar (icons) (roll cursor over to ID). - Scrolling.

	4. Use multiple ways to do same thing (menu, icon, keyboard) 5. Know how computers store files. 6. Know how to; - Insert and remove flash drive. - Save files as a new file, - Save an existing file. - Use My Computer to find flash drive and find files.
Learning Outcomes	Upon completion of this module students should be able to ; 1. Customize windows applications. 2. Know how they would use formatting. 3. Manage files successfully.
Units	1. Windows. 2. File Management.
Readings	1. Williams B., 1995. Using Information Technology: A Practical Introduction to Computers & Communications. Irwin Publishing. Chicago- USA. ISSN 0-256-15350-7. 2. Vermaat, M. Discovering Computers. 2010. Cengage Learning. Boston – USA. ISSN 978-0-495-80638-7.
Activities	1. Minimize, resize, exit buttons; click & drag, resize with cursor. 2. Click to see the options. 3. Roll cursor over icon for name. 4. Show Minimize and Restore with Task bar. 5. Move scroll bar with click, click & drag and arrows. 6. Resize, minimize and restore a window. 7. Monitor the students as the do the activity on their own. 8. Have a casual quiz at the end of class … name a function and ask them which key to us

Module 3; Word processing	
Key Concepts	Word**,** Document, Microsoft Word**,** Formatting
Overview	Using a computer to create, edit, and print documents, of all computer applications, word processing is the most common. Word processing **means** writing, editing, and production of documents, asletters, reports, and books, through the use of acomputer program or a complete computer system designed to facilitate rapid and efficient manipulation of text.
Aims	1. Learn how to open Word (icon, Start menu, All Programs) 2. Identify what is a "document" 3. Using cursor with text (how to position, different types of cursor) 4. Review menu bar and tool bar 5. Using keyboard with text (arrows, backspace, delete, tab, shift, space, enter keys) 6. Highlighting text (click & drag, full line from margin, edit/select all) 7. Be familiar with; formatting commands (Bold/Italicize/Underline, show as "on/off" icons) - Font size, Font type (review drop down arrow) - Text color, Text highlight (review drop down arrow) - Alignment (left, center, right) 8. Practice typing and use of the special function keys and cursors.
Learning Outcomes	Upon completion of this module students should be able to apply word applications.
Units	1. Word Introduction. 2. Review Windows and Word. 3. Word Formatting Commands
Readings	1. Williams B., 1995. Using Information Technology: A Practical Introduction to Computers & Communications. Irwin Publishing.

	Chicago- USA. ISSN 0-256-15350-7. 2. Vermaat, M. Discovering Computers. 2010. Cengage Learning. Boston – USA. ISSN 978-0-495-80638-7.
Activities	1. Introduce Microsoft Word 2007/2010. 2. Introduce Word menu and tool bars. 3. Show how to use menus, icons and special function keys. 4. Show how to open/close Word, add text and use special function keys. 5. Compare Word documents to paper (what's the same and what's different) 6. Write a list of the special keys on the board. 7. Use Menu: click for option; Icon: roll cursor over for id 8. Explain I-beam cursor vs. vertical bar cursor (pointer vs. insertion point); show how cursor changes appearance in the margin (white arrow) 9. Insert text or new lines, how to highlight text and how to erase text. 10. Monitor the students as the do the activity on their own. 11. Have a casual quiz at the end of class … name a function and ask them which key to use.
Module 4; Spreadsheets, PowerPoint, Internet and Web Basics,	
Key Concepts	Excel, PowerPoint, Internet, Web
Overview	This module offers students a brief introduction to; 1. Microsoft Excel, which is a database program that can be used for office work, budgeting, and organization. 2. PowerPoint which is considered a basic and most staple tool to effective presentations. 3. Internet which is very famous nowadays for satisfying people with various services related to various different fields.

Aims	1. To understand; - What is Excel? - What is a Spreadsheet? - How to format cells? 2. To be familiar with Spreadsheet vocabulary. 3. To understand how to navigation and how to enter data in Excel. 4. To deal with basic equations in Excel. 5. To understand; - What is PowerPoint? 6. To identify Parts of PowerPoint Screen. 7. To know how to insert texts and pictures in a PowerPoint slide. 8. Acquire a basic understanding of advanced PowerPoint practices. 9. To understand; - What is the Internet? - What is a Web Browser? - What are Links and navigation bars? - What is a website address or URL? 10. To know how to use the website address/URL in the address bar). 11. To learn how to use the basic functions of a browser. 12. To avoid the major pitfalls and risks found online and to protect their computers with antivirus software. 13. T o be familiar with basic computer maintenance operations.
Learning Outcomes	1. Accomplish creating basic worksheets, presentations. 2. Use the basic functions of a browser and explore the Web. 3. Identify computer risks and safety.
Units	1. Spreadsheets 2. PowerPoint 3. Internet and Web Basics, 4. Security and Protection, 5. Computer Maintenance,

Readings	1. Williams B., 1995. Using Information Technology: A Practical Introduction to Computers & Communications. Irwin Publishing. Chicago- USA. ISSN 0-256-15350-7. 2. Vermaat, M. Discovering Computers. 2010. Cengage Learning. Boston – USA. ISSN 978-0-495-80638-7.
Activities	1. Create a worksheet. 2. Create a presentation. 3. Practice applications and learned skills on both Excel and PowerPoint programs. 4. Give students an introduction to how to find information on the web. 5. Start a web browser (Google, Mozilla Firefox or Internet Explorer 6. Getting to Google (toolbars, search box, other Google features) 7. Pick a topic to search for (e.g. recipes, used cars, news, SAF or SFNM) 8. See Google results page (3 components of result: link, content, URL) 9. Open a web browser and navigate to Google.com. 10. Do an example search. 11. Look at the results page. 12. Select a result and click on it. 13. Search for something else "Cars"
Module 5; Computer and Climate Change.	
Key Concepts	Climate Change
Overview	Global Climate Change (GCC) is probably the most complex challenge ever faced by humans and in its entirety well beyond the comprehension by the human mind. The tool best suited to gaining a comprehension of the various individual elements, and their interactions, is computer modeling. Computer

	models have been invaluable as we begin to understand GCC, and have generally provided excellent and accurate predictions,
Aims	1. To understand what is Climate Change. 2. To identify climate change impacts. 3. To understand how computers help answer questions about how climate change is affecting our world, 4. To understand how computers help us predict the climate.
Learning Outcomes	Upon completion of this module students should be able to familiar with the importance of computer applications in predicting climate changes and in understanding how climate change is affecting our world.
Units	1. Climate change. 2. Overview of climate computer modeling
Readings	1. Bouwer, L. M., and others (2004). Adaptation and Funding in Climate Change Policies. In Kok and de Coninck:173-201. 2. Gupta, J. (1997). Th e Climate Change Convention and Developing Countries: From Confl ict to Consensus? Boston/London: Kluwer Academic Publ. 3. Heemst, J. van, and V. Bayangos (2004). Poverty and Climate Change. In: Kok M.T.J. and H.C. de Coninck, 2004: 21-52. 4. Michaelowa, A., and M. Dutschke (2000). Climate Policy and Development: Flexible Instruments and Developing Countries. Cheltenham, UK: Edward Elgar. 5. Munasinghe, M., and R. Swart (1999). Climate Change and its Linkage with Development, Equity and Sustainability. Proceedings of the IPCC Expert Meeting, Colombo, 27-29 April 1999. Paris: IPCC, WMO. 6. www. Climateprediction.net
Activities	• A series of short lecture videos for each section. Videos will have

	embedded quizzes. • Optional reading assignments associated with each section. • Homework problems and quizzes, several of which rely on computer simulations of climate models. • Forum discussions. (These are optional, but encouraged.) • Final project on analyzing climate data.

Jerash University

Course Syllabus

College: Economics and Administrative Sciences
Department: Business Administration

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours:
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 206107
Course Name: Knowledge Management
Class Hours:
Classroom:
Prerequisites:

Course Description:

This course presents a management concept of sustainable innovation management in commercial and governmental organizations. It provides answers to the question how people, teams, projects, companies and governments can create value and competitive advantage by adopting sustainability as a key driver for their innovation processes. A paradigm shift is happening at this moment. Where over the past decades firms were focused on creating shareholder value, the creation of a 'shared value' is now gaining terrain: leading management scholars like Peter Senge and Michael Porter are describing how companies create value by including all stakeholders in their firm's strategies. New strategies are centered on respect for the environment, employees, and other stakeholders as to create positive self-reinforcing cycles of value creation. This requires fundamentally different management models in which collaboration with a wide array of stakeholders is essential. Sustainability is hence no longer a story of wishful thinking or environmental activists; it is at the core of corporate strategy and decision making. Moreover, growth in sustainable markets as renewable energy, organic food, and e.g. fair trade products is double digit year after year. Sustainability is not a fashion or an attempt of firms to 'look good,' empirical evidence suggest that proper sustainability management improves firm performance and creates new entrepreneurial opportunities in rapidly growing markets.

Course Learning Objectives:

1. Increase awareness of the importance of sustainability for future business professionals;
2. Increase understanding of how companies, public, and government are interrelated in addressing and solving sustainability issues,
3. Explore how sustainable innovation can be managed.

Expected Course Outcomes:

By the end of this course, students will be able to;

1. Understand that sustainable innovation is crucial to counter the challenges our societies are facing: energy without CO2 emissions, access to water and food, reliable banks, affordable elderly care, climate resilient cities. All fields require a structural rethinking of existing systems, and introduction of new products, services, and structures to make a sustainable future possible.
2. Benefit of knowledge and apply it to new innovations in order to help sustain the climate and the environment. New and existing firms, companies, stakeholders, and the government will take such knowledge and innovations into consideration and fund such projects.
3. Explain how managers develop sustainability strategy; how they gain support for sustainability initiatives; and how they evaluate sustainability performance in their organizations;
4. Analyze work processes and operations in order to understand how to improve resource efficiency and limit and environmental impact;
5. Identify models for financing and evaluating the economic performance of sustainability initiatives;
6. Discover the importance of varied stakeholder interests, inside and outside of organizations, in the formulation of sustainability initiatives;
7. Synthesize, apply and communicate sustainability knowledge to solve environmental problems.

Course Resources:

1. Bossink, B.A.G., 2012. Eco-innovation and Sustainability Management. New York: Routledge.
2. Barbier, Edward and Markendya, Anil. 2013. A New Blueprint for a Green Economy. New York: Routledge.
3. Johnston, Sadhu A., Parzen, Julia and Nicholas, Steve. 2013. The Guide to Greening Cities. Island Press: Washington DC.
4. Shah, Jigar. 2013. Creating Climate Wealth: Unlocking the Impact Economy." ICOSA: Denver Colorado.

Recommended Websites

Students are advised to read various sources of sustainability news. Below are examples of these news sources:

1. http://www.greenbiz.com
2. http://www.environmentalleader.com
3. http://grist.org
4. http://www.sustainablebrands.com
5. http://www.csrwire.com
6. http://www.unep.org/newscentre
7. http://www.nrdc.org/policy
8. /http://www.edf.org/blog

9. / http://www2.epa.gov/newsroom
   / http://www.doi.gov/customcf/DOI/doi_rss .cfm
10. http://climatepolicyinitiative.org
11. / http://www.guardian.co.uk/environment
12. / http://www.wasterecyclingnews.com

Part 3: Assignments, Course policies, and Grading Policy

Exams: There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.

Grade Components:

Component	Grade
Homework & assignments	10% (4x2.5%)
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Second Exam	20%
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Total	100%

Grading Policy: In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

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Late Policy: The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.

Cheating: Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.

Classroom Protocol and Participation Guidelines*: Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.*

Part 4: Course Outline/Schedule

Week	Topic
1	Introduction: Overview of the course
2	Sustainable Business Management
3	Approaches to the Integration of Sustainability
4	Continuation
5	The Making of Greener Products
6	Continuation
7	Low - Carbon Transportation

Week	Topic
8	Climate Change Adaptation and Business
9	Sustainable Agriculture
10	Continuation
11	Sustainable Investing
12	Building Sustainable Communities
13	Renewable Energy
14	Strategies for Sustainability
15	Continuation Evaluation and Assessment
16	Final Exams

Part 5: Course Modules

Module 1; Sustainable Business Management	
Key Concepts	**Sustainability, environment, management, business, organizations**
Overview	Sustainability is being able to endure and survive in an environment into the future. In terms of business, sustainability management is about incorporating social, economic and environmental factors into your business decisions. It involves placing an emphasis on future, long term goals for your business rather than focusing on short term profits. Currently, the focus of sustainability management has been placed on the importance of environmental sustainability. Environmental sustainability is an increasingly important aspect of modern business management, as market pressure from regulators and consumers holds organizations accountable for their actions. Responsible businesses are congratulated and improve their image

	as leaders in the field.
Aim	The aim of this module is to teach students to manage business sustainability that can be more competitive, more adaptable, and more profitable. Also, this module aims to raise awareness of business holders and investors to reduce its negative impact on society and increase its positive influence.
Learning Outcomes	1. Identify and avoid future costs associated with unsustainable business practices, such as dumping industrial waste into the environment. 2. Plan for changes in consumer expectations and allow them to capitalize on emerging markets and industries. 3. Introduce new business management concepts such as corporate social responsibility and business ethics.
Units	1. Introduction: Overview of the course. 2. Sustainable Business Management. 3. Approaches to the Integration of Sustainability
Readings	**1.** Barbier, Edward and Markendya, Anil. 2013. A New Blueprint for a Green Economy. New York: Routledge. **2.** Johnston, Sadhu A., Parzen, Julia and Nicholas, Steve. 2013. The Guide to Greening Cities. Island Press: Washington DC. **3.** http://www.environmentalleader.com **4.** http://grist.org **5.** http://www.sustainablebrands.com **6.** http://www.csrwire.com **7.** http://www.unep.org/newscentre
Activities	19. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and

	invited lecturers. 20. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 21. The students will also be asked to write critical summaries on the lectures content. 22. For each unit the students will submit an individual reflection paper of approximately 1000 words. 23. firms' visits, 24. reports, 25. quizzes
Module 2; Climate Change Adaptation and Business	
Key Concepts	Climate change, Adaptation, Resilience, business, challenges, companies
Overview	This module illustrates how businesses are to respond effectively to climate change risks and impacts on growing economies. For to adapt for a green economy makes the business well-connected to the company needs and strategic plan of production in order to have a green community and to satisfy consumers. So, this module discusses the challenges these companies confront in their attempts of incorporating sustainable development strategies into their business plans. The connection between green economy and business investment will be discussed too.
Aims	This module aims at inspiring and informing companies to adapt to climate change;

	1. Engage business makers to support business contributions to climate change adaptation in order to have a more resilient community; 2. To give a good example for other companies and organizations to become partners to those communities suffering from climate change risks and impacts.
Learning Outcomes	By the end of this module, students will be able to: 1. Raise awareness of companies and organizations to take part in adapting to climate change; 2. Realize that greening business and economy are associated with the demand of the market, 3. Encourage the government to support the private sector in facilitating for climate change mitigation and resilience.
Units	1. The Making of Greener Products 2. Low - Carbon Transportation 3. Sustainable Agriculture
Readings	**1.** Bossink, B.A.G., 2012. Eco-innovation and Sustainability Management. New York: Routledge. **2.** Barbier, Edward and Markendya, Anil. 2013. A New Blueprint for a Green Economy. New York: Routledge. **3.** Johnston, Sadhu A., Parzen, Julia and Nicholas, Steve. 2013. The Guide to Greening Cities. Island Press: Washington DC. **4.** http://www2.epa.gov/newsroom **5.** http://www.doi.gov/customcf/DOI/doi_rss .cfm **6.** http://climatepolicyinitiative.org
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers.

	2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words. 5. firms' visits, 6. reports, 7. Quizzes
Module 3; Sustainability Strategies	
Key Concepts	Sustainability, strategies, integration, collaboration, reporting, innovation, eco-strategies
Overview	This module highlights the strategies that should by applied by companies and the government in order to achieve sustainability. Corporate sustainability strategies can aim to take advantage of sustainable revenue opportunities, while protecting the value of business against increasing energy costs, the costs of meeting regulatory requirements, changes in the way customers perceive brands and products. Not all eco-strategies can be incorporated into a company's Eco-portfolio immediately. The widely practiced strategies include: Innovation, Collaboration, Process Improvement and Sustainability reporting.

Aims	1. To share knowledge and to propel innovation; 2. To draw attention of companies to change their products and services toward less waste production and sustainable best practices; 3. To integrate the best new processes of sustainability
Learning Outcomes	By the end of this module, students will be able to: 1. Realize the importance of involving stakeholders and individuals in business management and decision making toward sustainability; 2. Share knowledge about sustainability between corporations, individuals, and government; 3. Learn how to apply sustainability strategies for having a greener universe.
Lessons	1. Sustainability 2. Sustainability Strategies 3. Building Sustainable Communities 4. eco-strategies
Readings	1. Bossink, B.A.G., 2012. Eco-innovation and Sustainability Management. New York: Routledge. 2. Barbier, Edward and Markendya, Anil. 2013. A New Blueprint for a Green Economy. New York: Routledge. 3. Johnston, Sadhu A., Parzen, Julia and Nicholas, Steve. 2013. The Guide to Greening Cities. Island Press: Washington DC. 4. Shah, Jigar. 2013. Creating Climate Wealth: Unlocking the Impact Economy." ICOSA: Denver Colorado. 5. http://www.nrdc.org/policy 6. http://www.edf.org/blog 7. http://www2.epa.gov/newsroom

	8. http://www.doi.gov/customcf/DOI/doi_rss .cfm 9. http://climatepolicyinitiative.org 10. http://www.guardian.co.uk/environment
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words. 5. firms' visits,
Module 4; Sustainable Investing	
Key Concepts	Investing, long-term, commitment, responsible, clean, social
Overview	Sustainable investing describes an approach to investing driven by the long-term economic, environmental, and social risks and opportunities facing the global economy. What distinguishes this approach from other approaches of investing is the conviction of its commitment to systematically integrate environmental, social, and economic factors

	within the choices of assets and the implementation of policy. It is a comprehensive approach that is responsible, clean, social, and sustainable.
Aim	The aim of this module is to draw the attention of students of the possibility of having a sustainable investing in case it becomes systematically responsible, clean, and social in the sense that it cares for the outcome and its environmental values.
Learning Outcomes	By the end of this module, students will be able to: 1. Draw attention of companies and organizations to adopt sustainable investing; 2. Share knowledge of sustainable investing development and to propel innovation; **3.** Characterize the aspects of sustainable investing and try to convince companies to have such programs.
Units	Sustainable Investing
Readings	1. Barbier, Edward and Markendya, Anil. 2013. A New Blueprint for a Green Economy. New York: Routledge. 2. Johnston, Sadhu A., Parzen, Julia and Nicholas, Steve. 2013. The Guide to Greening Cities. Island Press: Washington DC. 3. Shah, Jigar. 2013. Creating Climate Wealth: Unlocking the Impact Economy." ICOSA: Denver Colorado. 4. http://www.nrdc.org/policy 5. http://www.edf.org/blog 6. http://www2.epa.gov/newsroom
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers.

	2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words. 5. firms' visits, 6. reports, 7. quizzes

Jerash University

Course Syllabus

College: Agriculture
Department: Animal Production and Protection

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 602491
Course Name: Practical Agriculture/ Animal Production
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites:

Course Description:

The purpose of this course is to provide an overview of animal agriculture with a focus on practical and management practices related to the health, husbandry, feeding, breeding, climate change effect, and marketing of beef and dairy cattle, small ruminants, poultry, and alternative agricultural species. This will be accomplished through lectures and hands-on experiences during field visits and laboratory sessions. Live animals will be used during laboratories in accordance with law regulations, and all laboratories will be conducted with respect for the animals. The overall objective of this course is to provide practical skills to students that will model them into professionals that will provide technical expertise that helps in reduces risk to producers of different operational sizes and enhances environmental quality. Climate change risks on farm animals' production will be addressed through the last module of this course.

Course Learning Objectives:

- Demonstrate an understanding of livestock production in Jordan
- Know the biology of animals and its interactions with the environment and climate change
- Understand how the inputs and processes interact in animal production systems
- Understand the technologies used in producing and marketing animal and animal products

Expected Course Outcomes:

240. Student will be able to observe &/or perform routine livestock management practices as well as physical examinations
241. Understand how various management practices impact animal health, welfare, and productivity in order to attain optimum production level that conserve resources and lead to sustainability.
242. Identify and locate resources related to animal science and agriculture
243. The ability to use facts, concepts, principles in real life situations and situations related to environment and climate change.
244. The ability to analyze and interpret animal related situations in the farm, and make reasoned judgments and recommendations.

Course Resources:

118. Reading material consists of handouts/internet websites.
119. Scientific Farm Animal Production, 10th ed., 2012. Thomas G. Field Pearson Prentice Hall
120. Principles of animal production, 1995 by Shakeb Abdraheem, and Waleed Lobbade. University of Al-Quds.

Part 3: Assignments, Course policies, and Grading Policy

Exams: *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

Grade Components:

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

Grading Policy: In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

Course Policies: All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither gives nor receive unauthorized assistance.

Homework Assignments: Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.

Late Policy: The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.

Cheating: Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.

Classroom Protocol and Participation Guidelines: Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.

Part 4: Course Outline/Schedule

Week	Topics
1	1. Introduction; 2. Morphology & Physiology; 121. Ruminant versus pseudo-ruminant 122. Structure and functions of the digestive system of a bird.
2	Practical Activities (Faculty Farm)
3	Nutrition; - Feed and feed rations; constituents and their sources, and roles in animal nutrition - Essential components of a balanced ration - Poultry Rations: 1. starter; 2. finisher; 3. Layer feed.
4	1. Rotational grazing, zero grazing, continuous grazing. 2. Supplementary feeding, concentrate, silage, hay.
5	Practical Activities (Faculty Farm)
6	Animal Housing;

Week	Topics
	1. Farm Design and Management 2. Appropriate materials used in construction of animal housing.
7	Animal Housing; Safety, security, cleaning, sanitation, ventilation, protection from elements.
8	Practical Activities (Faculty Farm)
9	Animal Breeding and Reproduction; 1. Breeding and cross-breeding: heterosis, disease resistance, improved production. 2. Artificial insemination; frozen semen; oestrus synchronization. 3. Natural and artificial incubation. 4. Significance of biotechnology or genetic engineering (artificial alteration of the genetic composition of the organisms); benefits and concerns including ethical and religious.
10	Management Practices; 1. Brooding, feeding, immunization, debeaking in layers. 2. Include feeding, cannibalism, sanitation. 3. Birds and large animals Health
11	Practical Activities (Faculty Farm)
12	Management Practices; Handling Large Ruminants; - Dairy Cattle - Beef Cattle
13	Practical Activities (Faculty Farm)
14	Management Practices; Handling Small Ruminants - Sheep - Goats
15	Animal Products; - Eggs, meat, milk, manure ….

Week	Topics
	- Climate change impacts on farm animals products.
16	Final Exams' week

Part 5: Course Modules

Module 1; MORPHOLOGY AND PHYSIOLOGY	
Key Concepts	Farm Animals, Physiology, Morphology
Overview	At this module students will relate the structure of the digestive system of a bird to its functions, also identify the parts of the digestive system of ruminant and non-ruminant animals. Students will be able to explain the functions of the parts of the digestive system of ruminant and non-ruminant animals, and describe the process of digestion in ruminant and non- ruminant animals. On the other hand, they will relate the structure of the parts of an egg to its function in different bird types.
Aim	Enhance students understanding of farm animals' physiology and morphology.
Learning Outcomes	At the end of this module students will be able to: 123. Identify digestive system of animals and egg formation.
Units	1. Structure and functions of the digestive system of a bird. 2. Ruminant versus pseudo-ruminant
Readings	**124.** Scientific Farm Animal Production, 10th ed.,

	2012. Thomas G. Field Pearson Prentice Hall 125. Principles of animal production, 1995 by Shakeb Abdraheem, and Waleed Lobbade. University of Al-Quds.
Practical Activities	126. Examine and identify the parts of the digestive system of a bird. 127. View preserved parts of the digestive system of ruminant and non-ruminant animals in the lab. 128. Observation of the internal and external parts of an egg.
Module 2; ANIMAL NUTRITION	
Key Concepts	Nutrients, Feed, Feeding
Overview	This module will provide students with information about animal nutrition, the will identify the sources of carbohydrates, proteins, fats, minerals and vitamins; explain 'balanced ration'. They will also select appropriate rations for each stage of growth of broilers and layers; calculate Feed Conversion Ratio (FCR) and explain the importance of FCR. This module also will focus of large animal feeding systems, it will describe systems of grazing; state the advantages and disadvantages of different grazing systems; explain the importance of forages(grasses and legumes) in livestock feeding, and describe the measures used to feed ruminants when forage is unavailable.
Aim	Enhance students understanding of farm animals' feeding systems.
Learning Outcomes	At the end of this module students will be able to: 129. Identify feeding system and feed components that offered to animals.
Units	1. Feed and feed rations; constituents and their sources, and roles in animal nutrition

	2. Essential components of a balanced ration 3. Rations in birds include: (a) starter; (b) finisher; (c) Layer feed. 4. Rotational grazing, zero grazing, continuous grazing. 5. Supplementary feeding, concentrate, silage, hay.
Readings	**130.** Scientific Farm Animal Production, 10th ed., 2012. Thomas G. Field Pearson Prentice Hall 131. Principles of animal production, 1995 by Shakeb Abdraheem, and Waleed Lobbade. University of Al-Quds.
Practical Activities	132. Use simple food tests to identify carbohydrates, proteins and fats. 133. Examine samples of different feedstuffs. 134. Examine labels from commercial ration and identify the components. 135. Visit a feed mill. 136. Develop a portfolio on broiler and egg production. 137. Calculate Feed Conversion Ratio. 138. Maintenance of small grass and legume plots. Identify, collect and mount forage plants.
Module 3; HOUSING	
Key Concepts	Housing
Overview	At this module students will explain the principles that govern housing requirements for farm animals and describe the housing and space requirements for broilers, layers and rabbits. Also students will be able to explain the factors to be considered in the sitting and establishment of a farm.
Aim	Enhance student's knowledge about housing systems.

Learning Outcomes	At the end of this module students will be able to: 139. Identify housing systems for the different types of animals
Units	1. Farm Design and Management 2. Safety, security, cleaning, sanitation, ventilation, protection from elements. 3. Appropriate materials used in construction of animal housing.
Readings	**140.** Scientific Farm Animal Production, 10th ed., 2012. Thomas G. Field Pearson Prentice Hall 141. Principles of animal production, 1995 by Shakeb Abdraheem, and Waleed Lobbade. University of Al-Quds.
Practical Activities	142. Visits of different farms with different housing systems.
Module 4; ANIMAL BREEDING AND REPRODUCTION	
Key Concepts	Breeding, Reproduction.
Overview	This module will introduce students to the breeds of each class of animals commonly reared in Jordan, Also explain different breeding systems in animal production and explain the advantages of cross-breeding. It will also focus on the process of artificial insemination (AI) in farm animals and evaluate the use of A.I. in farm animals. Differentiate among the terms: a. ovulation; b. fertilization; c. gestation; d. estrous cycle; e. kindling, f. parturition. Also it will describe the process of egg formation and incubation in poultry, and explain genetic engineering in livestock production.
Aim	Enhance student knowledge about the reproduction system and animal breeding.

Learning Outcomes	At the end of this module students will be able to: 143. Identify animals breeds 144. Apply AI and define reproduction procedure in farm animals.
Units	1. Breeding and cross-breeding: heterosis, disease resistance, improved production. 2. Artificial insemination; frozen semen; oestrus synchronization. 3. Natural and artificial incubation. 4. The significance of biotechnology or genetic engineering (artificial alteration of the genetic composition of the organisms); benefits and concerns including ethical and religious.
Readings	**145.** Scientific Farm Animal Production, 10th ed., 2012. Thomas G. Field Pearson Prentice Hall 146. Principles of animal production, 1995 by Shakeb Abdraheem, and Waleed Lobbade. University of Al-Quds.
Practical Activities	147. Identify Signs of heat in farm animals. 148. Apply AI 149. Experiment with small scale incubators. 150. Visit to hatcheries.
Module 5; MANAGEMENT PRACTICES	
Key Concepts	Management Practices.
Overview	This module will describe the management practices associated with the care of baby chicks and explain the management practices associated with rearing broilers, layers and rear a number of broilers per term (about 2000 birds). It will also describe the general signs of illness in farm animals; identify pests and diseases of poultry and rabbits; describe the symptoms of pests and diseases infestation in poultry. Also student

	will determine the prevention, control and cure of pests and diseases in poultry and large animals.
Aim	Enhance students understanding of raising poultry and reduce management problems.
Learning Outcomes	At the end of this module students will be able to: 151. Rear a group of birds and large and small ruminants.
Units	1. Brooding, feeding, immunization, debeaking in layers. 2. Include feeding, cannibalism, sanitation. 3. **Birds and large animals Health** 4. **Handling Large Ruminants;** 5. Handling Small Ruminants
Readings	**152.** Scientific Farm Animal Production, 10th ed., 2012. Thomas G. Field Pearson Prentice Hall 153. Principles of animal production, 1995 by Shakeb Abdraheem, and Waleed Lobbade. University of Al-Quds.
Practical Activities	154. Conduct management practices in rearing broilers, layers and rabbits. 155. Rear rabbits and a batch of broilers and layers. 156. Prepare a cost analysis for a batch of broilers.
Module 6; ANIMAL PRODUCTS	
Key Concepts	Production, Products, climate change impacts
Overview	This module introduces a list of principal farm animal products and by-products including those derived from offal. Also students will determine the dressing percentage of different farm animals; and determine the most appropriate age to slaughter broilers. Climate change risks on farm animals' production will be addressed in this module.
Aim	Enhance student understanding of animal products and

	realizing of climate change risks on these products.
Learning Outcomes	At the end of this module students will be able to: 157. Deal with animal products.
Units	1. Egg production, milk processing and preservation, honey production, wax, bee bread and royal jelly. 2. Importance of fish as a source of protein for human nutrition and livestock feed. 3. Eggs – dried eggs, shell as fertilizer, handicraft, calcium supplements for bird. 4. Meat – cured meat (sausage, ham, and bologna). 5. Milk – cheese, yogurt. 6. Manure – biogas. 7. Economic age, weight and time to slaughter animals, live weight versus carcass weight. 8. Processes from egg collection stage to when the egg reaches the consumer. 9. Climate change impacts on farm animals products.
Readings	**158.** Scientific Farm Animal Production, 10th ed., 2012. Thomas G. Field Pearson Prentice Hall 159. Principles of animal production, 1995 by Shakeb Abdraheem, and Waleed Lobbade. University of Al-Quds.
Practical Activities	160. Identification of meat cuts and carcass quality. 161. Visit to milk processing facility. 162. Calculation of dressing percentage of broilers. 163. Slaughter and dress broilers. 164. Conduct marketing strategies to sell broilers. 165. Collect, clean, sort, grade and pack eggs.

Jerash University

Course Syllabus

College: Arts
Department: English Language and Translation

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours:
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 102108
Course Name: Communication Skills in English Language
Class Hours:
Classroom:
Prerequisites:

Course Description:

This course helps student become more adept at discovering and generating meaning, in developing and refining their self-awareness as learners, in expanding their repertoires of reading and writing strategies, and in developing their abilities as purposeful readers and writers. The course offers a content based approach where all four skills of speaking, listening, reading and writing are integrated to foster various speaking opportunities. Since the main focus of the course is on speaking, the listening, reading and writing tasks serve as springboard to either generate or to complement speaking. The emphasis put on variety, language skills and the balance between input and practice throughout the course help students become more confident, autonomous and competent speakers of English. Also

attention is given to issues of organization and surface-level elements of academic writing. Students use reading, writing, and speaking to learn about important universal issues such as climate and the environment (Global Warming, energy, pollution, deforestation, carbon dioxide, etc.; and they compose relatively simple texts to communicate with real readers (self, classmates, and teacher) about this issue.

Course Learning Objectives:

- The main objectives of the course are to:

- provide material for the students to learn pronunciation of the English sounds, to learn to read, write, and to know the fundamentals of English grammar and vocabulary;
- develop the students' reading skills to enable them to skim an adapted text for main idea, to scan an adapted text for specific information, to interpret an adapted text for inferences;
- develop the students' writing skills to enable them to respond to input applying information to a specified task, to elicit, to select, to summarize information in essays (140-160 words);
- develop the students' listening skills to enable them to understand and apply specific information from the input (within the framework of Breakthrough level);
- develop the students' speaking skills to enable them to use general, social and professional language (within the framework of Breakthrough level);
- develop the students' general capacity to a level that enables them to use English in their professional and academic environment (within the framework of Breakthrough level).

Expected Course Outcomes:

- The course aims at developing a wide range of skills:

- Language Development, which involves grammar and extensive vocabulary learning.
- Writing skills, which have a specific focus on literacy and short essays, memoranda, and notes on issues of the climate and environment.
- Reading which involves studying instructional business-related texts.
- Listening which includes comprehension of gist and detailed information.
- Communication skills which cover communication situations (within the framework of Breakthrough level).

Course Resources:

- Cotton D., Falvey D., Kent S. Market Leader. *Intermediate Business English*. Longman, 2001.
- Tillitt, Bruce and Mary Bruder. *Speaking Naturally: Communication Skills in American English.* Cambridge, 1985.
- Evans V., Dooley J. Upstream. *Intermediate workbook*. Express Publishing. 2002.
- Evans V., Dooley J. Upstream. *Grammar*. Express Publishing. 2002.
- Nelson, Thomas. *English Skills: Book 5.* Cheltenham: John Jackman, 1994.

Part 3: Assignments, Course policies, and Grading Policy

- **Exams:** There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.

- **Grade Components:**

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%

Total	100%

- **Grading Policy**: In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.
- **Course Policies:** All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither gives nor receive unauthorized assistance.
- **Homework Assignments:** Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.
- **Late Policy:** The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.
- **Cheating:** Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.
- **Classroom Protocol and Participation Guidelines:** Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.

Part 4: Course Outline/Schedule

Week	Topics
1	Introduction into the course: Basics
2	Basics of English Skills
3	Sentence Order
4	Word Order
5	Sentence Types
6	Speaking and Conversation
7	Practicing Speaking
8	Listening Skills
9	Practicing Listening
10	Reading
11	Writing
12	Practicing Reading
13	Practicing Writing
14	Text Types
15	Evaluation and Assessment
16	Evaluation and Assessment

Part 5: Course Modules

Module 1; Basics of English Skills	
Key Concepts	Reading, writing, sentence types, word order, expression
Overview	The students learn to pronounce, read and write. They

	acquire their knowledge of fundamental grammatical structures and functions (e.g. sentence types, tenses, voice, parts of speech, word order, expressing possibility, obligation, necessity, prohibition, criticism; expressing preferences, making assumptions; asking for/ refusing/giving permission; making offers, suggestions, etc.) They acquire their fundamental vocabulary to fulfill the above mentioned functions in roles, topics, and discussions that are related to climate, environment and sustainability. The focus, in this module, is on rainforests and how to protect them.
Aim	This module aims at teaching students the basics of communication skills. It also aims at opening topics and discussions related to issues of the climate and environment.
Learning Outcomes	By the end of this module, students will be able to: - Express ideas and thoughts about protecting the rainforests of the Amazon and cliffs under attack. - Put words in the right order. - Distinguish sentence types through the text. - Learn about the fundamental grammatical structures and functions. - Expressing possibility, obligation, preferences and assumptions.
Units	Units related to; 1. Basics of English Skills 2. Sentence Order 3. Word Order
Readings	• Nelson, Thomas. *English Skills: Book 5.* Cheltenham:

	John Jackman, 1994.
Activities	26. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 27. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 28. The students will also be asked to write critical summaries on the lectures content. 29. For each unit the students will submit an individual reflection paper of approximately 1000 words. 30. firms' visits, **31.** reports, 32. Quizzes 33. Reading, writing, expressing, **34.** video-movie watching
Module 2; Conversation and Speaking	
Key Concepts	Speaking, conversation, vocabulary, topics
Overview	The students are taught to be able to converse on different topics (people, jobs, places to visit, festivals/celebrations, disasters/accidents, eating habits, sports/hobbies, environment, climate, sustainability, education,

	entertainment, transport, crime, etc.).
Aim	This module aims at developing the skill of speaking and conversing through communicating with one another on different topics.
Learning Outcomes	By the end of this module, students are expected to: - Express permission, refusal, acceptance, request, suggestion, objection, etc. - Converse with other students on different topics. - Use grammatical structures and functions properly.
Units	Units related to; 1. Sentence Types 2. Speaking and Conversation 3. Practicing Speaking
Readings	• Cotton D., Falvey D., Kent S. Market Leader. *Intermediate Business English*. Longman, 2001. • Tillitt, Bruce and Mary Bruder. *Speaking Naturally: Communication Skills in American English.* Cambridge, 1985.
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the

	mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words. 5. firms' visits, **6.** reports, 7. Quizzes 8. Reading, writing, expressing, 9. video-movie watching
Module 3; Listening Skills	
Key Concepts	Listening, focus, interaction, environment, climate
Overview	The students learn to understand spoken language. Listening texts include monologues and interacting speakers. They are taught to focus on understanding the gist, the main points, look for details or specific information, and deduce the meaning. They will watch and listen to video clips about climate, the environment and examples on sustainability. This activity will be done in the lab.
Aim	This module aims at improving the skill of listening to dialogues, situations, and clips on nature, climate and the environment, and developing understanding the main points.
Learning Outcomes	By the end of this module, students are to: - Understand listening to different topics and situations.

	- Learn about the different topics and issues of the climate and environment through listening. - Show attention, understanding, or agreement while listening
Units	Units related to; 1. Listening Skills 2. Practicing Listening
Readings	• Cotton D., Falvey D., Kent S. Market Leader. *Intermediate Business English*. Longman, 2001.
Activities	8. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 9. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 10. The students will also be asked to write critical summaries on the lectures content. 11. For each unit the students will submit an individual reflection paper of approximately 1000 words. 12. firms' visits, **13.** reports, 14. Quizzes 15. Reading, writing, expressing,

	16. video-movie watching
Module 4; Reading and Writing	
Key Concepts	Strategies, text structure, text types, writing
Overview	The students are offered adapted/instructional reading material and are encouraged to learn to use different strategies for different reading purposes: identifying the main points in a text, looking for detail, locating specific information in a text, understanding a text structure, etc. The students are expected to learn to produce written texts of various types: formal / informal / transactional letters, argumentative essays (expressing opinions, for and against), narration (story writing), memoranda and notes. The texts chosen for these skills will mainly focus on issues of the climate and the environment and sustainability.
Aim	This module aims at developing the reading comprehension and writing skills of the students on issues of the climate, environment, and sustainability.
Learning Outcomes	By the end of this module, students are expected to: - Read texts of different topics and special weight will be given to texts dealing with climate and environment issues and sustainability. - Write paragraphs and essays on such topics.
Units	1. Reading 2. Writing
Readings	• Cotton D., Falvey D., Kent S. Market Leader. *Intermediate Business English*. Longman, 2001.
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are

	held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words. 5. firms' visits, **6.** reports, 7. Quizzes 8. Reading, writing, expressing, 9. video-movie watching

Jerash University

Course Syllabus

College: Agriculture
Department: Animal Production and Protection

Part 1: Instructor Information

Instructor Name:
Office Location:
Office Hours: (Times & Days)
Office Telephone:
E-mail:

Part 2: Course Information

Course Number: 602340
Course Name: Animal Environment
Class Hours: (Times & Days)
Classroom: (Number & Building)
Prerequisites: Ag 602201

Course Description:

The course shows the aspects of effects of environmental factors on physiological processes in farm animals. General responses to heat stress, thermo-neutral zone, heat and cold stress, thermoregulation, behavioral responses, homeostasis, welfare and role of genotype. Acclimatization and adaptation, health, economic losses and measurements of heat stress effects, also the effect of climate change on animal performance.

The overall objective of this course understands farm animals (Cattle, Sheep, Goat and Poultry) environmental needs and biological responses to the environments which is essential for providing good animal care and maintaining optimum performance.

Course Learning Objectives:

1. To develop a basic understanding of animal physiological responses to the environment and how these responses influence health, performance and well-being
2. To acquire principles of thermal biology of farm animals to the environment with special focus on heat stress.
3. To develop the ability to relate principles of thermal biology to problems of farm animal management caused by adverse environments under sever climate conditions.
4. To develop an advanced understanding of the environmental needs of farm animals.
5. To develop science-based recommendations for farm animals management in variable climate conditions.

Expected Course Outcomes:

1. Students will learn the biological and physiological mechanisms by which animals adapt to their environment
2. How to manage livestock and other domestic animals under various climate conditions.
3. Understanding the adaptation methods used by animals to cope with climate changes.

Course Resources:

There is no required textbook. Various reading will be handed out during the semester. The following resources may be helpful;

166. Ewing, S., Lay, D. and Von Borell, E. 1998. Farm Animal Well-Being: Stress Physiology, Animal Behavior and Environmental Design.
167. Letra, N (Ed). 2009. Interaction between Climate and Animal Environments.
168. R. J. Collier with J. L. Collier (Ed). 2012. Environmental Physiology of Livestock.
169. Philip, C. and Piggins, D. (Ed). 1992Farm Animals and the Environment.
170. http://jajo66.files.wordpress.com/2010/10/environmental-physiology-of-animals.pdf
171. http://labspace.open.ac.uk/file.php/5850/!via/oucontent/course/338/s324_4_bk2_ch1.pdf
172. http://www.umassk12.net/ipy/sess09/Thermoregulation%20article.pdf
173. http://www.biologymad.com/resources/A2%20Homeostasis.pdf
174. http://www.fvet.uba.ar/areas/fisica/articulos_cient_divulgacion/The_development_of_the_concepts_of_homeothermy_and_thermoregulation.pdf
175. http://aas.bf.uni-lj.si/zootehnika/supl/3-2012/PDF/3-2012-41-49.pdf
176. https://www.okcareertech.org/educators/cimc/new-products/clusters/ag-cluster/pdf-files/ag2student.pdf
177. http://www.fao.org/docrep/014/i2415e/i2415e00.pdf

178. http://www.apa.org/pubs/journals/releases/amp-66-4-265.pdf
179. http://www.gulfofmaine.org/state-of-the-gulf/docs/climate-change-and-its-effects-on-ecosystems-habitats-and-biota.pdf

Part 3: Assignments, Course policies, and Grading Policy

Exams: *There will be first, second, and final exams. Exams will be closed book. They will cover material from text, lecture, sections, the readings, and projects. In particular, students are likely to do poorly on the exams and in the course if they do not do their share of the homework and assignments.*

Grade Components:

Component	Grade
Homework & assignments	10% (4x2.5%)
First Exam	20%
Second Exam	20%
Final Exam	50%
Total	100%

Grading Policy: In order to receive credit for the course, students must complete 100% of the course activities with satisfactory responses and spend the required minimum time in the course. If an assignment is found to be unsatisfactory, the student must revise and re-submit by the due date given by the instructor. Course activities are comprised of discussion board postings, readings, study groups, activities and short quizzes.

Course Policies: All students must be honest and forthright in their academic studies. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to neither do their own work and neither gives nor receive unauthorized assistance.

Homework Assignments: Homework assignments are due 30 minutes before lecture (unless otherwise noted) on the due date.

Late Policy: The policy is simple: no slip dates. If assignments are late, they are penalized as follows: < 24 hours late, you lose 10% of the assignments grade; < 48 hours, 20%; < 72 hours, 40%. More than three days late, you can no longer hand-in the assignment.

Cheating: Copying other people's solution sets, Google safaris, or from any other sources is strictly prohibited.

Classroom Protocol and Participation Guidelines: Students are expected to come to ALL classes. They are expected to arrive on time and stay until the class period ends. If they know that they have to leave early, they should notify the instructor before class starts. They cannot pass the class under any circumstances if they miss ten classes. The instructor expects and encourages class participation, and it counts for 10% of students' grade.

Part 4: Course Outline/Schedule

Week	Topics
1	**-** Introduction - Terminology-Glossary of terms for environmental physiology
2	- Physical properties of heat and temperature - Homeostasis
3	**-** Animals Environments - Environmental physical factors
4	- Optimal animal environment - Animal welfare
5	**-** Thermo neutral zone
6	- Heat stress - General responses of animal to heat stress
7	Thermoregulation

Week	Topics
	- Heat loss - Heat gain - Body heat production
8	- Heat balance - Insulation behavior
9	- Effects of heat stress on certain physiological parameters - Rectal temperature - Respiratory rate - Heart rate
10	- Evaporative water loss - Heat production - Feed intake - Water intake
11	- Environmental adaptation and acclimatization
12	- Environment and animal health
13	- Economic losses due to heat stress - Effects of heat stress on farm animal performance
14	- Management strategies to reduce heat stress in farm animals
15	Climate change and animal performance-
16	Final Exam

Part 5: Course Modules

Module 1; Animals responses to the environment	
Key	Farm animals, environment

Concepts	
Overview	This module introduces the students to the main concepts concerning domestic animals and how they react to different environments, and how to manage livestock and other domestic animals under various environmental conditions It gives an introduction about domestic animals (species, origins, where and how to rise them). Adaptation to different environments and climate change in the areas where animals grow and live (Environmental adaptation and acclimatization).
Aim	Enhance students understanding of the environmental changes and how it may affect domestic animals responses.
Learning Outcomes	At the end of this module students will be able to: 1. Identify how different species needs suitable environment to survive and live. 2. Understanding the adaptation methods used by animals to cope with environmental changes.
Units	1. Introduction 2. Terminology-Glossary of terms for environmental physiology 3. Physical properties of heat and temperature 4. Homeostasis
Readings	1. Philip, C. and Piggins, D. (Ed). 1992. Farm Animals and the Environment. 2. http://jajo66.files.wordpress.com/2010/10/environmental-physiology-of-animals.pdf 3. http://labspace.open.ac.uk/file.php/5850/!via/oucontent/course/338/s324_4_bk2_ch1.pdf
Activities	35. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers.

	36. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 37. The students will also be asked to write critical summaries on the lectures content. 38. For each unit the students will submit an individual reflection paper of approximately 1000 words.
Module 2; Thermoregulation	
Key Concepts	Heat loss, Heat gain, Body heat production, Heat balance, Insulation behavior
Overview	This module will focus on the ability of domestic animals on keeping its body temperature within certain boundaries, even when the surrounding temperature is very different. It will give students a full understanding of some important concepts lay underneath the subject of thermoregulation such as body heat loss, gain, production and balance, also how animals use insulation behavior to protect themselves from changes in the temperature outside and surrounding of its body.
Aim	The overall aim of this module is to make students understand the subject of thermoregulation in animals in different weathers and conditions surrounding them.
Learning Outcomes	At the end of this module students will be able to: 1. Differentiate between body heat loss, gain, production and balance. 2. Identify temperature regulation methods used by animals to protect themselves from temperature changes.

Units	1. Animals Environments 2. Environmental physical factors 3. Optimal animal environment 4. Animal welfare 5. Thermo neutral zone 6. Thermoregulation
Readings	1. R. J. Collier with J. L. Collier (Ed). 2012. Environmental Physiology of Livestock. 2. Ewing, S., Lay, D. and Von Borell, E. 1998. Farm Animal Well-Being: Stress Physiology, Animal Behavior and Environmental Design. 3. http://www.umassk12.net/ipy/sess09/Thermoregulation%20article.pdf 4. http://www.biologymad.com/resources/A2%20Homeostasis.pdf 5. http://www.fvet.uba.ar/areas/fisica/articulos_cient_divulgacion/The_development_of_the_concepts_of_homeothermy_and_thermoregulation.pdf
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content.

	4. For each unit the students will submit an individual reflection paper of approximately 1000 words.
Module 3; Effects of environment on animal	
Key Concepts	Nutrition, Feed intake, Water intake, Body weight gain and loss, Environment
Overview	Nutrition is an important subject in animal science; therefore this module will focus on showing students how different environments affect animal nutrition and performance. The module will focus on the main nutrients needed by animals in different physiological situations during its life span. It will also concentrate on how changing environment affecting feed and water intake, and body gain.
Aim	Enhance students understanding of the relationship between nutrition and environmental changes.
Learning Outcomes	At the end of this module students will be able to: 1. Recognize nutrients requirement for animals. 2. The effect of different environments and climates on animal physiology.
Units	1. Heat stress 2. General responses of animal to heat stress 3. Heat balance 4. Insulation behavior 5. Effects of heat stress on certain physiological parameters
Readings	1. Philip, C. and Piggins, D. (Ed). 1992. Farm Animals and the Environment. 2. http://aas.bf.uni-lj.si/zootehnika/supl/3-2012/PDF/3-2012-41-49.pdf 3. https://www.okcareertech.org/educators/cimc/new-products/clusters/ag-cluster/pdf-files/ag2student.pdf

Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words.
Module 4; Environment and animal health	
Key Concepts	Health, Diseases, Environment
Overview	A relationship between animal health and economic losses was found to be positive, furthermore, constant changing of environment may affect animal health by reducing their ability to adaptation and fight different diseases. This module will concentrate on the relationship between environment and animal health by showing the main causes of diseases and the possible ways of protecting animals from getting sick and by that reduces the economical losses that may be caused during the process.
Aim	Enhance students' awareness of animal diseases and disorders that may be caused by changing climate conditions.
Learning Outcomes	At the end of this module students will be able to: 1. Discuss the effect of heat stress on animal health. 2. Knowing different diseases caused by environmental changes

Units	1. Respiratory rate 2. Heart rate 3. Evaporative water loss 4. Heat production 5. Feed intake 6. Water intake
Readings	1. R. J. Collier with J. L. Collier (Ed). 2012 Environmental Physiology of Livestock. 2. http://www.fao.org/docrep/014/i2415e/i2415e00.pdf
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words.
Module 5; Effect of climate changes on animal performance	
Key Concepts	Climate change, performance
Overview	Our climate is changing, both naturally and due to human exploitation. There is undeniable evidence that animals, birds and plants are being affected by climate change and global warming in both their distribution

	and behavior, which could cause a quarter of land animals, birdlife and plants to become extinct. This module will give students an idea about climate change and how it affects domestic animals. It will also introduce students to the climate change problem and encourage them to discuss some solutions that may reduce it.
Aim	Enhance students' awareness about climate change issue and its effect on domestic animals
Learning Outcomes	At the end of this module students will be able to: 1. Identify the main causes of climate change problem 2. Discuss some solutions to the problem
Units	1. Environmental adaptation and acclimatization. 2. Economic losses due to heat stress. 3. Effects of heat stress on farm animal performance. 4. Management strategies to reduce heat stress in farm animals. 5. Climate change and animal performance.
Readings	1. Letra, N (Ed). 2009. Interaction between Climate and Animal Environments. 2. http://www.apa.org/pubs/journals/releases/amp-66-4-265.pdf 3. http://www.gulfofmaine.org/state-of-the-gulf/docs/climate-change-and-its-effects-on-ecosystems-habitats-and-biota.pdf
Activities	1. Seminars / Lectures; a series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by the main instructor (course examiner) and invited lecturers. 2. Group exam task with presentation; with the acquired understanding achieved through the course, the students will be ready for a group task exam. The objective of this group exam task is to verify the understanding of key mechanisms in the

	mitigation of climate change both in terms of policy as in terms of measures. 3. The students will also be asked to write critical summaries on the lectures content. 4. For each unit the students will submit an individual reflection paper of approximately 1000 words.

JORDAN UOJ

Course Syllabus

0935473 Environmental Engineering

University of Jordan, Faculty of Engineering & Technology,

Chemical Engineering Department

Fall Semester, 2014-2015

Instructor Information

Instructor: Dr. Ahmad M. AbuYaghi
Office Location: University Campus, Engineering Building, 2nd Floor
Office Telephone: +962 6 535 5000 Ext. 22906
Office Hours: Mon Wed 9:30- 11:00am
E-mail: ahmad.ay55@gmail.com
Faculty Website: http://www2.ju.edu.jo/sites/Academic/abuyaghi/default.aspx

Course Identification

Course Number: **0935473**
Course Name: Environmental Engineering
Course Location: University Campus
Class Times: Mon Wed 11:00am- 12:30pm
Prerequisites: 0955342 Solid Particulates

Course Description/Overview

Environmental Engineering uses environmental science principles, along with engineering concepts and techniques (design, operation and maintenance of engineering units, structures or equipment) to assess the impacts of societal activities on the environment and the impact of environment on people as well as to protect both

human and environmental health. Environmental Engineering is a multidisciplinary area that requires a sound background in various subjects of pure and applied sciences covering both technical and social aspects to deal with the quality and availability of environmental resources.The catalog description of the course is as follows:

Concepts and terminology.Sources and impacts of water pollutants. Conventional water and wastewater treatment processes: Sedimentation, flocculation, softening, filtration, disinfection and biological systems. Sources and impacts of air pollutants. Air pollution control through gas cleaning devices: cyclones and wet scrubbers. Solid waste classification, handling and ultimate disposal.

Course Objectives

The overarching goals of this course are providing students with exposure to the main topics in environmental engineering in a multidisciplinary learning approach that integrates air, water and soil pollution covering issues of from scientific, engineering and management perspectives.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Be familiar with major environmental laws, regulations, standards and ethics.
2. Understand the environmental quality parameters and how to measure and communicate them.
3. Describe the major pollutants of environment as well as their sources, effects, measurement and expression.
4. Select and design basic processes and techniques for water treatment, waste management and pollution control.
5. Appreciate the role and responsibility of engineers in sustainable development .
6. Work in team.

Course Resources

Course Website(s)

Required Course Texts and Materials

1. Davis, M.L. and Cornwell, D.A. Introduction to Environmental Engineering, McGraw-Hill, 5th Edition, 2013. http://www.mcgrawhill.ca/highereducation/products/9780073401140/
2. Peavy, H.S.; D.R. Rowe and G. Tchobanoglous. Environmental Engineering, McGraw-Hill, 1985.
3. Hand-outs prepared by the instructor.

Optional Course Texts and Materials

http\\:

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Assignments	10
Group Project	10
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time.Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion.According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses. No makeup for classwork.

Course Schedule

Week	Date	Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)

1	15/9/2014	**Course Overview** Discussion of syllabus and evaluation tools, Course requirements and policy, Course Introduction: Concepts and terminology
2	22/9	Overview of ecological andenvironmental systems:Water, Air and solid waste management
3-4	29/9, 6/10	Environmental ethics, laws, regulations and standards. Environmental impact assessment and sustainability policy.
5-6	13/10, 20/10	Water treatment,water pollution and water quality management Classwork #1
7-9	27/10, 3/11, 10/11	Environmental Microbiology,selection, design and operation of municipal wastewater treatment systems: suspended and attached growth processes, nutrient removal Classwork #2, Midterm Exam
10-11	17/11, 24/11	Air pollution and meteorology, climate change, global, regional and local effects
12	1/12, 8/12	Gas and particulate pollutants sources, effects, dispersion and control. Classwork #3
13-14	8/12, 15/12	Solid waste management including waste minimization, processing, recycling, recovery and ultimate disposal Classwork #4
15	22/12	Introduction to hazardous waste Term Project Submission
16	29/12	Environmental management in Jordan: discussion of policy, practice and case studies in light of what have been learned from course

Course Syllabus

0905475 Air Pollution

University of Jordan, Faculty of Engineering & Technology,

Chemical Engineering Department

..... Semester, 2014-2015

Instructor Information

Instructor: Dr.MotasimSaidan

Office Location: University Campus, Engineering Building, 2nd Floor

Office Telephone: +962 6 535 5000 Ext. 22893

Office Hours:

E-mail: m.saidan@ju.edu.jo

Faculty Website: http://www2.ju.edu.jo/sites/Academic/

Course Identification

Course Number: **0905475**

Course Name: Air Pollution

Course Location: University Campus

Class Times:

Prerequisites: 0905421

Course Description/Overview

Air pollution has significant effects on human health and the environment, through interrelated problems of ozone and particulate matter air pollution, acid rain, visibility degradation, mercury, stratospheric ozone depletion, and climate change. Significant strides have been made in the past few decades to improve our understanding of the sources, chemical transformation, transport, deposition, and impacts of different pollutants. We now understand that many air pollutants are linked together through complex chemical interdependencies. The catalog description of the course is as follows:

Air pollution: sources, dispersion and effects of air pollutants. Topics include emission factors, emission inventory, air pollution meteorology, air chemistry, air quality modeling, impact assessment, source and ambient monitoring, regional control strategies

Course Objectives

The overarching goals of this course are providing students with:

1. Basic understanding of meteorology and its relation to air pollution
2. Understanding of air pollution, its sources, origins, and ultimate fate.
3. Understanding of the local, regional, and global impacts of air pollution.
4. Fundamental understanding of the concepts of dispersion modeling and dissipation of pollutants in the atmosphere
5. Develop the skills needed to successfully design air pollution control equipment.
6. Become familiar with the regulatory apparatus concerning air quality.
7. Enhance the ability of students for life-long learning and communication skills

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Demonstrate appreciation of the role of air stability classifications in air pollution
2. Demonstrate ability to identify the major sources and sinks of air pollutants
3. Understand the key chemical transformations of air pollution
4. explore several regional and global air pollution problems
5. Demonstrate ability to model the dispersion of air pollutant and evaluate hazards associated with a process facility
6. apply knowledge from general science and engineering courses tounderstand and solve problems in air pollution control

7. Describe engineering solutions to air pollution problems
8. gain insight to the reasons for environmental law and air quality standards
9. Enhance students' skills through intensive use of available data resources and short projects with written and oral presentations

Course Resources

Course Website(s)

Required Course Texts and Materials

4. Nicholas P. Cheremisinoff, Handbook of air pollution prevention and control, 2002.
5. Instructor Handouts.

Optional Course Texts and Materials

1. Daniel A. Vallero, Fundamentals of Air Pollution, 4th edition
2. Davis, M.L. and Cornwell, D.A. "Introduction to Environmental Engineering", McGraw-Hill, N.Y., 4th edition or later.

http\\:

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Group Project	15
Presentation	5
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time.Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion. According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses.

Course Schedule

Week	**Date**	**Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)**
1		Introduction and Syllabus
2-4		Atmosphere and Meteorology
5-6		Air Pollutants and Human Health Effects; Indoor Air Pollution
7-8		Air Pollution &Global Consequences
9-10		Transport and Dispersion of Air Pollution
11-12		Measurement of Pollutant Emissions ; Air Quality & Pollution Prevention

13-15		Control of Stationary Sources
16		Control of Mobile Sources

Course Syllabus

0935475 Solid Waste Management

University of Jordan, Faculty of Engineering & Technology,

Chemical Engineering Department

..... Semester, 2014-2015

Instructor Information

Instructor: Dr. Motasim Saidan
Office Location: University Campus, Engineering Building, 2nd Floor
Office Telephone: +962 6 535 5000 Ext. 22893
Office Hours:
E-mail: m.saidan@ju.edu.jo
Faculty Website: http://www2.ju.edu.jo/sites/Academic/

Course Identification

Course Number: **0935475**
Course Name: Air Pollution
Course Location: University Campus
Class Times:
Prerequisites: 0905421

Course Description/Overview

The catalog description of the course is as follows:

This course examines methods of managing solid and hazardous waste, with an emphasis on pollution prevention. Topics covered include relevant local and international legislation, recycling, incineration, landfill operations.

Course Objectives

The overarching goals of this course are providing students with basic knowledge and understanding on solid waste types, characteristics, processing, and disposal as well as other management issues including policy and economy.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Gaining knowledge in solid waste concepts, definitions, and components
2. Basic understanding ofintegrated solid waste management.
3. Fundamental understanding of landfill design
4. Model developing of biogas potential production from the landfill
5. Develop the skills needed to successfully design waste collection and collection routing .
6. Become familiar with the regulatory apparatus concerning waste management and policy.

Course Resources

Course Website(s)

Required Course Texts and Materials

6. William Worrell & P.AarneVesilind, Solid Waste Engineering, 2012.
7. George Tchobanoglous, Handbook of Solid Waste Management, 2002
8. Instructor Handouts.

Optional Course Texts and Materials

3. Davis, M.L. and Cornwell, D.A. “Introduction to Environmental Engineering”, McGraw-Hill, N.Y., 4th edition or later.

http\\:

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Homework	5
Projects	15
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time.Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion.According to University regulations; the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses.

Course Schedule

Week	Date	Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)
1		Introduction and Syllabus;Solid waste definition, concepts
2		Solid waste chemical, physical and biological characterization
3-4		Solid waste generation and quantities
5-6		Solid waste collection and routings
7-9		Processing for resource and energy recovery
10-11		Biochemical processes: aerobic, anaerobic and composting
12-13		Landfills: Planning, siting, design
14		Landfill Leachate and groundwater contamination
15		LFG and biogas potential production; mathematical modeling
16		Socio-economic assessment of SWM systems in Jordan: Questionnaire designing and data gathering, assessment and reporting

Course Syllabus

0905599 Project (Final Year Capstone Course)
University of Jordan, Faculty of Engineering & Technology,
Chemical Engineering Department
Fall Semester, 2014-2015

Instructor Information

Instructor:	All faculty members
Office Location:	University Campus, Engineering Building, 2nd Floor
Office Telephone:	+962 6 535 5000
Office Hours:	
E-mail:	
Faculty Website:	http://www2.ju.edu.jo/sites/Academic/

Course Identification

Course Number:	0905599
Course Name:	Project
Course Location:	University Campus
Class Times:	
Prerequisites:	Completion of 121 Credit Hours out of 165

Course Description/Overview

Final year project is gives a diverse experience to engineering students to bridge his academic knowledge with his future career. The projects are of theoretical, design-based nature. In some non-conventional projects, a minor experimental experience is possible. The project is conducted over two semesters as Project (1) and Project (2). The students go through a major design experience with different facets of professional issues including economic,environmental, sustainability,ethical, health and safety considerations.

A group of students perform flowsheet synthesis and/or selection for a chemical process including material and energy balances for the selected process (Project 1). Each student performs a detailed study of a chemical engineering problem from the selected process chosen in Project (1). The final report submitted by the group should include mass and energy balances, process flow diagram and detailed design of one or more items of equipment and other equivalent tasks.

Course Objectives

The objectives of the capstone course are:

1. Applying the methodology of design by utilizing the knowledge gained from past fundamental courses.
2. Applying time management fundamentals and cost effectiveness.
3. Implementing effective communication both orally and in writing.
4. Practicing effective team work management.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

Course Resources

Course Website(s)

Recommended References

9. Peters, M.; K. Timmerhaus and R.West. Plant Design and Economics for Chemical Engineers, 5th edition, McGraw-Hill, 2002.
10. Coulson, J.M. and J.F. Richardson. Chemical Engineering, Volume 6 - Design, 6th Edition, 1999.
11.

Optional Course Texts and Materials

http\\:

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Advisor(s) Evaluation	25
Final Report	35
Final Exam (Oral presentation and defence before a committee)	40
Total Points	**100**

Course Policy

There should be a weekly meeting attended by students and advisor(s) to plan, manage and follow up project activities. Absence of students from these meetings will certainly affect the advisor(s) evaluation grade.

Course Schedule: Project (1) One Credit Hour

Week	**Date**	**Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)**
1-2		Course syllabus, policy and orientation of students
3-4		Problem definition and theoretical background of project
5-6		Literature survey
7-8		Process flow sheet selection or synthesis
9-12		Process Analysis, Mass and energy balances
13-14		Interim report writing; Lab testing (as needed)
15-16		Preparation for Project (2)

Course Schedule*: Project (2) Two Credit Hours

Week	Date	Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)
1-4		Design of equipment or units
5-6		Economic feasibility and costing
7		Piping, instrumentation and process control
8-9		Pollution control and waste management
10-11		Health and safety issues
12		Plant layout
13-15		Final Report writing
16		Presentation and final Exam

*overlaps do exist among these activities, particularly report writing.

Course Syllabus

0905471 Energy Conservation & Management

University of Jordan, Faculty of Engineering & Technology,
Chemical Engineering Department
……. Semester, 2014-2015

Instructor Information

Instructor: Dr. Y. Al-Khraisha
Office Location: University Campus, Engineering Building, 2nd Floor
Office Telephone: +962 6 535 5000
Office Hours:
E-mail: khraisha@ju.edu.jo

Faculty Website: http://www2.ju.edu.jo/sites/Academic/

Course Identification

Course Number: 0905471
Course Name: EnergyConservation & Management
Course Location: University Campus
Class Times:
Prerequisites: 0905371 Fuel and Energy

Course Description/Overview

Review of energy sources and their applications. Energy auditing. Energy conservation in industrial and commercial sectors. Choice of fuel. Waste heat recovery systems. Energy economics and economic use of electricity. Process integration for efficient use of electricity. Process integration for efficient use of energy including energy cogeneration, selection of heat transfer equipment and enhancement of heat transfer.

Course Objectives

To save environment and reduce dependency on fossil fuel energy, more and more energy ha to be produced from renewable. Judicious use of energy, through energy conservation measures is a vital step in this regard. There is scope for energy saving in residential sector, industries and commercial establishments. New technologies and new products are coming up in the market, for energy saving. Knowledge of thermodynamic principles, usage of thermal insulation in buildings, lighting devices and new electric motor, is important. Energy-audit is an important tool to achieve the goal.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Understand concepts and principles of energy conservation and management.
2. carry out energy accounting and balancing.
3. suggest methodologies for energy savings.

Course Resources

Course Website(s)

Required Course Texts and Materials

1. Eastop, T.D., and Croft, D.R., 'Energy efficiency for engineers and Technologists', Longman Group UK, 1990.
2. Kennedy, W.J., Turner, W.C., and Capehart, B.L., 'Guide to Energy Management', Fairmont Press, 1994.
3. Wulfinghoff, D.R.,'**Energy Efficiency Manual'** Energy Institute Press, 2003.

Course Texts and Materials

http\\:

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Project	10
Midterm Exam	30
Second Exam	10
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time.Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion. According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses only.

Course Schedule

Week	**Date**	**Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)**
1-2		Course Overview. Review of energy sources and their applications.
3		Energy auditing.
4-5		Energy conservation in industrial and commercial sectors.
6-7		Waste heat recovery systems.
8-9		Energy economics and economic use of electricity
10-12		Process integration for efficient use of electricity.

13-15		Process integration for efficient use of energy including energy cogeneration selection of heat transfer equipment and enhancement of heat transfer.
16		Impact of energy conservation on environment

Course Syllabus

0905474 Waste Water Treatment

University of Jordan, Faculty of Engineering & Technology,

Chemical Engineering Department

…… Semester, 2014-2015

Instructor Information

Instructor: Dr. Ahmad M. AbuYaghi

Office Location: University Campus, Engineering Building, 2nd Floor

Office Telephone: +962 6 535 5000 Ext. 22906

Office Hours:

E-mail: ahmad.ay55@gmail.com

Faculty Website: http://www2.ju.edu.jo/sites/Academic/abuyaghi/default.aspx

Course Identification

Course Number: 0935474

Course Name: Waste Water Treatment

Course Location: University Campus

Class Times:

Prerequisites: 0955473

Course Description/Overview

Course Objectives

This course provides a multidisciplinary learning of both conventional and modern technology of wastewater treatment covering both municipal and industrial applications. Major aim is to present the fundamental operations and processes that are used in wastewater treatment introducing problem-solving concepts and tools.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Understand the role of application of physics, chemistry, microbiology and math in the characterization and treatment of wastewaters.
2. Understand the purpose, operation, mechanisms and basic design principles of common wastewater treatment processes.
3. Work in team to solve problems of wastewater characterization and treatment.

Course Resources

Course Website(s)

Required Course Texts and Materials

1. Metcalf & Eddy, Inc. Wastewater Engineering: Treatment & Reuse, McGraw-Hill, N.Y., 4th ed., 2003.
2. Davis, M. L. and Cornwell, D. A. Introduction to Environmental Engineering, 4nd Ed., McGraw-Hill, New York (2013).
3. Eckenfelder, W. Industrial Water Pollution Control, McGraw-Hill, N.Y., 1989.
4. Hand-outs prepared by the instructor.

Optional Course Texts and Materials

http\\:

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Group Assignments	20
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time.Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion. According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses.

Course Schedule

Week	**Date**	**Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)**
1		***Introduction: Overview of water pollutants***
2		***Water and wastewater quality standards and regulations***
3-4		***Characterization of municipal and industrial wastewaters***
5-7		***Conventional primary and secondary (biological) treatment***
8-10		***Tertiary (advanced) treatment of municipal wastewater***

11-14		***Management and treatment of industrial wastewaters; study of equalization, flotation, chemical precipitation, adsorption, membrane separation and land application.***
15		***Sludge handling and disposal***
16		***Water reuse and enviornmental impact assessment***

Course Syllabus

0905542 Water Desalination

University of Jordan, Faculty of Engineering & Technology,
Chemical Engineering Department
……. Semester, 2014-2015

Instructor Information

Instructor: Dr. Mohammed R. Qtaishat
Office Location: University Campus, Engineering Building, 2nd Floor
Office Telephone: +962 6 535 5000 Ext.
Office Hours:
E-mail: mrasool78@yahoo.com
Faculty Website:

Course Identification

Course Number: **0905542**
Course Name: Water Desalination
Course Location: University Campus
Class Times:
Prerequisites: 0955442 Heat and Mass transfer Operations

Course Description/Overview

Water desalination is one of the most important research fields nowadays, Jordan is ranked 4th among the poorest countries with fresh water resources. As a result, it is of great importance to introduce the Jordanian students to the desalination field stressing the fact that it is considered the most suitable solution for the nation's water crisis.

Course Objectives

To familiarize the students with various aspects of water desalination and desalination processes. The different technologies of thermal and membrane desalination are studied in addition to thermodynamic, heat transfer and mass transfer principles related to these technologies. Issues related to environmental impact and materials selection are also presented.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Understand the fundamental concepts of desalination: thermodynamics, heat transfer and mass transfer.
2. Identify the thermal and membrane desalination processes.
3. Identify and make a choice among the different desalination technologies for a certain application and water throughput.
4. Understand how the proper choice of a desalination technology can influence the environment and affect the economics of water.
5. Analyze and solve problems encountered in desalination processes.
6. Recognize important variables affecting water production and energy consumption.

Course Resources

Course Website(s)

Required Course Texts and Materials

12. K. S. Spiegler and Y. M. El-Sayed, Desalination Primar, 1st Ed., Balaban Desalination Publications, 1994
13. M. Wilf, The Guide Book to Membrane Desalination Technology, 1st Ed. Balaban Desalination Publications, 2007.
14. C. Sommariva, Intensive Course in Thermal Desalination Processes and Economics, European Desalination Society, Course Notes, L'Aquila, Italy, 2007.

Optional Course Texts and Materials

http\\:

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Project and Oral presentation	20
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time.Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion. According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses.

Course Schedule

Week	**Date**	**Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)**
1-2		Course Overview. Introduction, Desalination terminology

3-4		Sea water and Brackish water properties. Water Alkalinity. Scales Formation and Corrosion
5-8		Thermal Desalination Processes: Multi Stage Flash (MSF), Multi Effect Distillation (MED), Vapor Compression (VC)
9-12		Membrane Desalination Processes: Reverse Osmosis (RO), Nano filtration and Ultrafiltration (NF & UF), Electro Dialysis Membrane Fouling, pretreatment and post treatment in water desalination plants.
13-14		Novel Desalination Technologies: Membrane Distillation (MD) and Foreword Osmosis (FO)
15-16		Utilizing renewable energy resources and economics of Desalination processes. Sustainability.

Mapping Courses from Science & Technology Group

University of Jordan

Course Classification:

1. Core Courses (*for All Euro Pass Candidates*)
2. Elective Courses (*from Student Major or Group*)
3. Capstone Course
4. Additional Elective Courses

Core Courses:

Three courses (9 Credit Hours), one from each group as in the following Table:

Group	Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category

Environment and Society	2305100	Introduction to Sociology	---	Sociology	Arts	University Elective
Economics and Public Policy	1607100	International Political Economy	---	Business Economy	Business	University Elective
Science and Technology	0305100	Environment	---	Geology	Science	University Elective

Elective Courses:

Three programs from the Science and Technology group are involved, namely, Geology, Chemical Engineering and Mechanical Engineering. Six courses (18 Credit Hours) may be taken by student from his major or other majors within the group.

Course Code	**Course Title**	**Prerequisite**	**Department**	**Faculty (College)**	**Course Category**
0345102	Principles of Environmental Geology	0305101	Geology	Science	Dept. Core
0335361	Fundamentals of Hydrology	0335231	Geology	Science	Dept. Core
0345381	Earth Resources and Environment	0335231	Geology	Science	Dept. Core
0345481	Environmental Geochemistry	0345351	Geology	Science	Dept. Core.
0305402	Teaching Earth Science and Environment	0345392	Geology	Science	Dept. Core
0335461	Water Resources Management	0335361	Geology	Science	Dept. Elective
0345483	Environmental Impact Assessment	0365481	Geology	Science	Dept. Elective
0905371	Fuel and Energy	0905343	Chemical Engineering	Engineering & Technology	Dept. Elective
0905471	Energy Conservation and Management	0905371	Chemical Engineering	Engineering & Technology	Dept. Elective

0905473	Environmental Engineering	0905342	Chemical Engineering	Engineering & Technology	Dept. Core
0905474	Waste Water Treatment	0905473	Chemical Engineering	Engineering & Technology	Dept. Elective
0905474	Air Pollution	0905421	Chemical Engineering	Engineering & Technology	Dept. Elective
0905573	Solid Waste Management	0905473	Chemical Engineering	Engineering & Technology	Dept. Elective
0905542	Water Desalination	0905442	Chemical Engineering	Engineering & Technology	Dept. Elective
0904445	Air Conditioning (1)	0904441, 0904342	Mechanical Engineering	Engineering & Technology	Dept. Core
0904443	Thermal Power Plants	0904342	Mechanical Engineering	Engineering & Technology	Dept. Elective
0904554	Solar Energy	0905441	Mechanical Engineering	Engineering & Technology	Dept. Elective
0904453	Refrigeration Systems	0904342	Mechanical Engineering	Engineering & Technology	Dept. Elective
0904459	Energy Conversion	0904342	Mechanical Engineering	Engineering & Technology	Dept. Elective
0904545	Internal Combustion Engines	0904342	Mechanical Engineering	Engineering & Technology	Dept. Core

Capstone Course:

This course is based on design and/or practical training for senior students. Depending on the student major, the following courses fit as capstone course provided the training is conducted in the field of climate change and environmental sustainability. 6 Credit Hours.

Course Code	**Course Title**	**Prerequisite**	**Department**	**Faculty (College)**	**Course Category**
0300150	Community Service	---	Geology	Science	University Requirement

0905599	(Final Year) Project	Completing 124 Credit Hour	Chemical Engineering	Engineering & Technology	Department Core
0904599	(Final Year) Project	Completing 124 Credit Hour	Mechanical Engineering	Engineering & Technology	Department Core
0900500	Practical Training	Completing 120 Credit Hour	All Engineering	Engineering & Technology	College Requirement

Additional Elective Courses

The following list contains courses than can be taken by student in case he/she wishes to diversify knowledge or unable to register in elective courses offered by his/her Department.

Course Code	**Course Title**	**Prerequisite**	**Department**	**Faculty (College)**	**Course Category**
0352100	Energy Principles and Economics	---	Physics	Science	University Elective
0515100	Principles of Public Health	---	Family and Community Medicine	Medicine	University Elective
0601100	Home Plantation	---	Plant Production	Agriculture	University Elective
0802414	Environmental Education for Children	---	Curricula and Teaching	Educational Sciences	Dept. Elective
0905101	Jordanian Industries	---	Chemical Engineering	Engineering & Technology	University Elective
1601433	Business Ethics and Social Responsibility	---	Business Administration, Business Economy	Business	Department Elective
2633100	Archaeology of Jordan	---	Archaeology	Archaeology and Tourism	University Elective
2305100	Introduction to Sociology	---	Sociology	Arts	University Elective

2305421	Globalization Issues	---	Sociology	Arts	Dept. Elective
1132100	Sports and Health	---	Health and Recreation	Physical Education	University Elective

**A student cannot register in a university elective course offered by the Department of his/her major.

Course Description
Available; will be added after finalizing the selected courses list.

Course Syllabi
A unified template is desirable for all courses.

Course List and Course Syllabus Revision
The courses are selected from current Study Plans of related program at the University. The course list and course syllabi will be revised and updated immediately when Study Plans are modified or changed by academic programs.

Prepared by Dr. Ahmad M. AbuYaghi

Ahmad.ay55@gmail.com

July, 21st, 2014

Course Syllabus

0935473 Environmental Engineering

University of Jordan, Faculty of Engineering & Technology,

Chemical Engineering Department

Fall Semester, 2014-2015

Instructor Information

Instructor: Dr. Ahmad M. AbuYaghi

Office Location: University Campus, Engineering Building, 2nd Floor

Office Telephone: +962 6 535 5000 Ext. 22906

Office Hours: Mon Wed 9:30- 11:00am

E-mail: ahmad.ay55@gmail.com

Faculty Website: http://www2.ju.edu.jo/sites/Academic/abuyaghi/default.aspx

Course Identification

Course Number: **0935473**

Course Name: Environmental Engineering

Course Location: University Campus

Class Times: Mon Wed 11:00am- 12:30pm

Prerequisites: 0955342

Course Description/Overview

Environmental Engineering uses environmental science principles, along with engineering concepts and techniques (design, operation and maintenance of engineering units, structures or equipment) to assess the impacts of societal activities on the environment and the impact of environment on people as well as to protect both human and environmental health. Environmental Engineering is a multidisciplinary area that requires a sound background in various subjects of pure and applied sciences covering both technical and social aspects to deal with the quality and availability of environmental resources. The catalog description of the course is as follows:

Concepts and terminology. Sources and impacts of water pollutants. Conventional water and wastewater treatment processes: Sedimentation, flocculation, softening, filtration, disinfection and biological systems. Sources and impacts of air pollutants. Air pollution control through gas cleaning devices: cyclones and wet scrubbers. Solid waste classification, handling and ultimate disposal.

Course Objectives

The overarching goals of this course are providing students with exposure to the main topics in environmental engineering in a multidisciplinary learning approach that integrates air, water and soil pollution covering issues of from scientific, engineering and management perspectives.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

7. Be familiar with major environmental laws, regulations, standards and ethics.
8. Understand the environmental quality parameters and how to measure and communicate them.
9. Describe the major pollutants of environment as well as their sources, effects, measurement and expression.
10. Select and design basic processes and techniques for water treatment, waste management and pollution control.
11. Appreciate the role and responsibility of engineers in sustainable development .
12. Work in team.

Course Resources

Course Website(s)

Required Course Texts and Materials

15. Davis, M.L. and Cornwell, D.A. Introduction to Environmental Engineering, McGraw-Hill, 5th Edition, 2013. http://www.mcgrawhill.ca/highereducation/products/9780073401140/

16. Peavy, H.S.; D.R. Rowe and G. Tchobanoglous. Environmental Engineering, McGraw-Hill, 1985.
17. Hand-outs prepared by the instructor.

Optional Course Texts and Materials

http\\:

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Assignments	10
Group Project	10
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time. Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion. According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses. No makeup for classwork.

Course Schedule

Week	Date	Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)
1	15/9/2014	**Course Overview** Discussion of syllabus and evaluation tools, Course requirements and policy, Course Introduction: Concepts and terminology
2	22/9	Overview of ecological and environmental systems: Water, Air and solid waste management
3-4	29/9, 6/10	Environmental ethics, laws, regulations and standards. Environmental impact assessment and sustainability policy.
5-6	13/10, 20/10	Water treatment, water pollution and water quality management Classwork #1
7-9	27/10, 3/11, 10/11	Environmental Microbiology, selection, design and operation of municipal wastewater treatment systems: suspended and attached growth processes, nutrient removal Classwork #2, Midterm Exam
10-11	17/11, 24/11	Air pollution and meteorology, climate change, global, regional and local effects
12	1/12, 8/12	Gas and particulate pollutants sources, effects, dispersion and control. Classwork #3
13-14	8/12, 15/12	Solid waste management including waste minimization, processing, recycling, recovery and ultimate disposal Classwork #4
15	22/12	Introduction to hazardous waste Term Project Submission
16	29/12	Environmental management in Jordan: discussion of policy, practice and case studies in light of what have been learned from course

CLIMASP Course Modules for 0935473 Environmental Engineering

Course	**0935473**
Module 1	Introduction and overview of ecological and environmental systems
Key Concepts	Natural ecosystem, environment, pollution, water quality, water supply, air quality, waste management, role of engineer
Overview	
Aim	To instil an understanding by students of the multidisciplinary nature of Environmental Engine basic concepts from natural ecology and main areas of built environment.
Learning Outcomes	At the end of this module, students will be able to: • Understand the role of microbiology and chemistry in natural ecosystems • Identify the components and process steps of water treatment, wastewater

	Treatment/disposal, air quality management, solid waste processing/disposal
Units	Unit 1.1 What is Environmental Engineering Unit 1.2 Natural Ecological Systems Unit 1.3 Environmental Engineering Systems
Readings	
Activity	Reading and Class Discussion Read Chapter 1 of textbook (Davis & Cornwell)
Module 2	Environmental ethics, laws, regulations and standards; Environmental impact assessment and sustainability policy.
Key Concepts	Ethics, regulations, standards, sustainable development, EIA
Overview	
Aim	To familiarize students with common environmental values and national and international regu at different level to protect the environment
Learning Outcomes	At the end of this module, students will be able to: • Disclose environmental ethics for professionals • Understand the legal framework for environmental protection • Distinguish different types of legislation • Understand the relationship between environment and development • Appreciate EIA studies as a tool for sustainable development
Units	Unit 2.1 Ethics and Regulations Unit 2.2 Sustainable Development and EIA
Readings	Optional reading of the book: Introduction to Environmental Impact Assessment: A Guide to Principles and Practice by

	Bram F. Noble, Oxford, 2009.
Activity	Website visit, Reading, Class Discussion Visit the website of the Ministry of Environment in Jordan: www.moenv.gov.jo Read about the national environmental regulations including penalty for violations, administrative structure of Ministry, their projects for environmental preservation and enhancement A group Term Project is initiated. Term project is literature or field survey on a topic offered by instructor and chosen by students. A professional technical report is sought.
Module 3	Water treatment, water pollution and water quality management
Key Concepts	Coagulation, Chlorination, softening, BOD, TKN, eutrophication, dissolved oxygen sag
Overview	
Aim	To develop an understanding and knowledge on water pollution indicators, factors affecting them and the practical methods of water purification
Learning Outcomes	At the end of this module, students will be able to: • x •
Units	Unit 3.1 *Unit 3.2*
Readings	
Activity	Group classwork on problem solving of water chemistry and water pollution parameters, open book and notes
Module 4	Science & Engineering of Wastewater Treatment
Key Concepts	Microbiology, biomass growth, settling, biodegradation, aeration, nitrification / denitrification, phosphorus removal, design, operation
Overview	

Aim	
Learning Outcomes	
Units	Unit 4.1: Unit 4.2: Unit 4.3:
Readings	
Activity	Group classwork on problem solving and design Midterm Exam
Module 5	Air pollution and Control
Key Concepts	Stratification of atmosphere, climate change, carbon footprint, GHC, ozone depletion, acid rain, smog, health risk, primary and secondary pollutants, dispersion, renewable energy, collection efficiency
Overview	
Aim	
Learning Outcomes	
Units	Unit 5.1 Unit 5.2
Readings	
Activity	Group classwork on problem solving and design of air pollution dispersion as well as gas and particulate removal devices
Module 6	Solid Waste Management
Key Concepts	Waste classification, minimization, processing, recycling, recovery, landfill, incineration, Disposal, ground water contamination

Overview	
Aim	
Learning Outcomes	
Units	
Readings	
Activity	Group classwork Term project submission

Course Syllabus

0935473 Environmental Engineering

University of Jordan, Faculty of Engineering & Technology,

Chemical Engineering Department

Fall Semester, 2014-2015

Instructor Information

Instructor: Dr. Ahmad M. AbuYaghi
Office Location: University Campus, Engineering Building, 2nd Floor
Office Telephone: +962 6 535 5000 Ext. 22906
Office Hours: Mon Wed 9:30- 11:00am
E-mail: ahmad.ay55@gmail.com
Faculty Website: http://www2.ju.edu.jo/sites/Academic/abuyaghi/default.aspx

Course Identification

Course Number: **0935473**
Course Name: Environmental Engineering

Course Location: University Campus
Class Times: Mon Wed 11:00am- 12:30pm
Prerequisites: 0955342

Course Description/Overview

Environmental Engineering uses environmental science principles, along with engineering concepts and techniques (design, operation and maintenance of engineering units, structures or equipment) to assess the impacts of societal activities on the environment and the impact of environment on people as well as to protect both human and environmental health. Environmental Engineering is a multidisciplinary area that requires a sound background in various subjects of pure and applied sciences covering both technical and social aspects to deal with the quality and availability of environmental resources. The catalog description of the course is as follows:

Concepts and terminology. Sources and impacts of water pollutants. Conventional water and wastewater treatment processes: Sedimentation, flocculation, softening, filtration, disinfection and biological systems. Sources and impacts of air pollutants. Air pollution control through gas cleaning devices: cyclones and wet scrubbers. Solid waste classification, handling and ultimate disposal.

Course Objectives

The overarching goals of this course are providing students with exposure to the main topics in environmental engineering in a multidisciplinary learning approach that integrates air, water and soil pollution covering issues of from scientific, engineering and management perspectives.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

13. Be familiar with major environmental laws, regulations, standards and ethics.
14. Understand the environmental quality parameters and how to measure and communicate them.
15. Describe the major pollutants of environment as well as their sources, effects, measurement and expression.
16. Select and design basic processes and techniques for water treatment, waste management and pollution control.
17. Appreciate the role and responsibility of engineers in sustainable development .
18. Work in team.

Course Resources

Course Website(s)

Required Course Texts and Materials

18. Davis, M.L. and Cornwell, D.A. Introduction to Environmental Engineering, McGraw-Hill, 5th Edition, 2013. http://www.mcgrawhill.ca/highereducation/products/9780073401140/
19. Peavy, H.S.; D.R. Rowe and G. Tchobanoglous. Environmental Engineering, McGraw-Hill, 1985.
20. Hand-outs prepared by the instructor.

Optional Course Texts and Materials

http\\:

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Assignments	10
Group Project	10
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time. Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion. According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses. No makeup for classwork.

Course Schedule

Week	**Date**	**Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)**
1	15/9/2014	**Course Overview** Discussion of syllabus and evaluation tools, Course requirements and policy, Course Introduction: Concepts and terminology
2	22/9	Overview of ecological and environmental systems: Water, Air and solid waste management
3-4	29/9, 6/10	Environmental ethics, laws, regulations and standards. Environmental impact assessment and sustainability policy.

5-6	13/10, 20/10	Water treatment, water pollution and water quality management Classwork #1
7-9	27/10, 3/11, 10/11	Environmental Microbiology, selection, design and operation of municipal wastewater treatment systems: suspended and attached growth processes, nutrient removal Classwork #2, Midterm Exam
10-11	17/11, 24/11	Air pollution and meteorology, climate change, global, regional and local effects
12	1/12, 8/12	Gas and particulate pollutants sources, effects, dispersion and control. Classwork #3
13-14	8/12, 15/12	Solid waste management including waste minimization, processing, recycling, recovery and ultimate disposal Classwork #4
15	22/12	Introduction to hazardous waste Term Project Submission
16	29/12	Environmental management in Jordan: discussion of policy, practice and case studies in light of what have been learned from course

CLIMASP Course Modules for 0935473 Environmental Engineering

Course	**0935473**
Module 1	Introduction and overview of ecological and environmental systems
Key Concepts	Natural ecosystem, environment, pollution, water quality, water supply, air quality, waste management, role of engineer
Overview	
Aim	To instil an understanding by students of the multidisciplinary nature of Environmental Engine basic concepts from natural ecology and main areas of built environment.
Learning Outcomes	At the end of this module, students will be able to: • Understand the role of microbiology and chemistry in natural ecosystems • Identify the components and process steps of water treatment, wastewater Treatment/disposal, air quality management, solid waste processing/disposal
Units	Unit 1.1 What is Environmental Engineering Unit 1.2 Natural Ecological Systems Unit 1.3 Environmental Engineering Systems
Readings	
Activity	Reading and Class Discussion Read Chapter 1 of textbook (Davis & Cornwell)
Module 2	Environmental ethics, laws, regulations and standards; Environmental impact assessment and sustainability policy.

Key Concepts	Ethics, regulations, standards, sustainable development, EIA
Overview	
Aim	To familiarize students with common environmental values and national and international regu at different level to protect the environment
Learning Outcomes	At the end of this module, students will be able to: • Disclose environmental ethics for professionals • Understand the legal framework for environmental protection • Distinguish different types of legislation • Understand the relationship between environment and development • Appreciate EIA studies as a tool for sustainable development
Units	Unit 2.1 Ethics and Regulations Unit 2.2 Sustainable Development and EIA
Readings	Optional reading of the book: Introduction to Environmental Impact Assessment: A Guide to Principles and Practice by Bram F. Noble, Oxford, 2009.
Activity	Website visit, Reading, Class Discussion Visit the website of the Ministry of Environment in Jordan: www.moenv.gov.jo Read about the national environmental regulations including penalty for violations, administrative structure of Ministry, their projects for environmental preservation and enhancement A group Term Project is initiated. Term project is literature or field survey on a topic offered by instructor and chosen by students. A professional technical report is sought.
Module 3	Water treatment, water pollution and water quality management
Key Concepts	Coagulation, Chlorination, softening, BOD, TKN, eutrophication, dissolved oxygen sag
Overview	
Aim	To develop an understanding and knowledge on water pollution indicators, factors affecting

	them and the practical methods of water purification
Learning Outcomes	At the end of this module, students will be able to: • x •
Units	Unit 3.1 *Unit 3.2*
Readings	
Activity	Group classwork on problem solving of water chemistry and water pollution parameters, open book and notes
Module 4	Science & Engineering of Wastewater Treatment
Key Concepts	Microbiology, biomass growth, settling, biodegradation, aeration, nitrification / denitrification, phosphorus removal, design, operation
Overview	
Aim	
Learning Outcomes	
Units	Unit 4.1: Unit 4.2: Unit 4.3:
Readings	
Activity	Group classwork on problem solving and design Midterm Exam
Module 5	Air pollution and Control
Key Concepts	Stratification of atmosphere, climate change, carbon footprint, GHC, ozone depletion, acid rain, smog, health risk, primary and secondary pollutants, dispersion, renewable energy, collection efficiency

Overview	
Aim	
Learning Outcomes	
Units	Unit 5.1 Unit 5.2
Readings	
Activity	Group classwork on problem solving and design of air pollution dispersion as well as gas and particulate removal devices
Module 6	Solid Waste Management
Key Concepts	Waste classification, minimization, processing, recycling, recovery, landfill, incineration, Disposal, ground water contamination
Overview	
Aim	
Learning Outcomes	
Units	
Readings	
Activity	Group classwork Term project submission

Course Syllabus

0934545 Internal Combustion Engines

University of Jordan, Faculty of Engineering & Technology,

Mechanical Engineering Department

Fall Semester, 2014-2015

Instructor Information

Instructor:	Dr. Ahmad Sakhrieh
Office Location:	University Campus, Engineering Building, 3rd Floor
Office Telephone:	+962 6 535 5000 Ext. 22906
Office Hours:	Sun Tue Thu 9:00- 11:00 am
E-mail:	asakhrieh@ju.edu.jo
Faculty Website:	http://www2.ju.edu.jo/sites/Academic/abuyaghi/default.aspx

Course Identification

Course Number:	0934545
Course Name:	Internal Combustion Engines
Course Location:	University Campus
Class Times:	Sun Tue Thu 12:00am- 13:00pm
Prerequisites:	0904342

Course Description/Overview

The course starts with an introduction to engines, classifications and terminology which leads to the introduction and analysis of engine performance parameters and the main engine cycles including: Otto, Diesel, Dual and two-stroke cycles. Then the course moves to introduce the student to the common fuels used in IC engines, the reactions and the associated thermochemical calculations. This is followed by the introduction of engine emissions and their control technologies and strategies. After that, the student is made familiar with air and fuel induction methods and technologies, in addition to the physics of the combustion phenomena. Finally, the course ends with the evaluation of friction losses and the characterization of different engine lubricants.

Course Objectives

The course is intended to provide the student with the fundamental principles and operational characteristics of internal combustion engines. This will be achieved through covering a wide range of related topics with the support of lab-based experiments.

Course Learning Outcomes

Upon successful completion of this course, will be familiar with the following:

- Engine classifications and definitions
- Engine operating characteristics and performance evaluation
- Engine cycles
- Thermo-chemical calculations
- Properties of different fuels
- Air and fuel induction technologies
- The physics of the combustion phenomena
- Engine pollutants and emissions control strategies
- Friction losses and lubrication

Course Resources

Course Website(s)

Required Course Texts and Materials

21. W. Pulkrabek. Engineering Fundamentals of the Internal Combustion Engine, Prentice Hall, 2nd Int. edition, 2004.
22. Hand-outs prepared by the instructor.

Optional Course Texts and Materials

http\\:

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Assignments	10
Group Project	10
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time.Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion.According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses. No makeup for classwork.

Course Schedule

Week	Date	Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)
1	15/9/2014	**Course Overview** Engine Classification; Terminology; Engine Components; Basic Engine Cycles
2-4	22/9, 29/9,	**Operating Characteristics**; Engine Parameters; Work; Mean Effective Pressure;

	6,10	Torque and Power; Dynamometers; Air-Fuel Ratio; Specific Fuel Consumption; Engine Efficiencies; Volumetric Efficiency Classwork #1
5-7	13/10, 20/10 27/10	**Engine Cycles**; Air Standard Cycles; Otto Cycle; Diesel Cycle; Dual Cycle; Comparison of Cycles; Real Air-Fuel Cycles; Two Stroke Cycles
8-10	3/11,10/11, 17/11	**Thermochemistry and Fuels**; Thermochemistry; Hydrocarbon Fuels; Gasoline Fuel; Diesel Fuel; Alternative Fuels Classwork #2
11-12	24/11,1/12	**Air and Fuel Induction; Intake Manifold;** Intake Valves; Volumetric Efficiency; Fuel Injection; Carburetors; Supercharging and turbocharging; Midterm Exam
13	8/12	**Combustion;** Combustion in SI Engines; Homogeneous and Stratified mixtures; Fast Burn Chambers Classwork #3
14-15	15/12, 22/12	**Emissions and Air Pollution**; Carbon Monoxide; Hydrocarbons; Oxides of Nitrogen; Particulates; Other Emissions; Aftertreatment; Engine Modifications; Fuel Modifications
16	29/12	**Friction and Lubrication**; Engine Friction; Piston Forces; Engine Lubrication Systems; Lubricating Oils Classwork #4

Course Syllabus

0904554 Solar Energy

University of Jordan, Faculty of Engineering & Technology,

Mechanical Engineering Department

Fall Semester, 2014-2015

Instructor Information

Instructor:	Dr. Osama Ayadi
Office Location:	University Campus, Engineering Building, 2nd Floor
Office Telephone:	+962 6 535 5000 Ext. 22802
Office Hours:	Sun Tue Thu 9:00- 11:00 am
E-mail:	o.ayadi@ju.edu.jo
Faculty Website:	http://eacademic.ju.edu.jo/o.ayadi/default.aspx

Course Identification

Course Number:	0904554

Course Name: Solar Energy
Course Location: University Campus
Class Times: Mon Wen 9:30am- 11:00pm
Prerequisites: Heat Transfer (1) – 0904441

Course Description/Overview

Fundamentals of solar radiation; methods of solar radiation collection; thermal systems components and analysis; transfer of collected heat; storage of collected heat; domestic hot water system; introduction to solar energy applications.

Course Objectives

The course is intended to provide the student with the fundamental principles and operational characteristics of Solar energy and its applications. This will be achieved through covering a wide range of related topics with the support of lab-based experiments.

Course Learning Outcomes

Upon successful completion of this course, will be familiar with the following:

1. Understand the physics of solar radiation, solar times and angles.
2. Calculate the direction of solar radiation at any time and location.
3. Orient solar collection system at any time and location for maximum energy gain
4. Estimate and measure actual solar radiation at a surface of any orientation and position.
5. Select proper material for various components of solar energy collectors.
6. Select proper flat-plate solar collector for a desired job
7. Figure out the performance of various flat-plate solar collector combinations
8. Evaluate energy storage capabilities of a solar collection system
9. Model and predict thermal performance of a solar collection system
10. Evaluate the problems associated with local thermosyphonic solar collection systems.

Course Website(s)

http://oayadi.wix.com/course

Required Course Texts and Materials

23. J. A. Duffie, W. A. Beckman. Solar Engineering of Thermal Processes, Wiley. 3rd edition, 2006.
24. Hand-outs prepared by the instructor.

Optional Course Texts and Materials

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Assignments	10
Group Project	10
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time.Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion.According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses. No makeup for classwork.

Course Schedule

Week	Date	Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)
1-2		Solar radiation
3		Available solar radiation
4		Selected topics in heat transfer (A quick review)
5		Radiation transmission through covers and absorption by collectors
6-7		Theory of flat-plate collectors
7-8		Energy storage
8-11		System thermal calculations
12-15		Solar water heating

Course Syllabus

0904453 Refrigeration systems

University of Jordan, Faculty of Engineering & Technology,

Mechanical Engineering Department

Fall Semester, 2014-2015

Instructor Information

Instructor: Dr. Osama Ayadi

Office Location: University Campus, Engineering Building, 2nd Floor

Office Telephone: +962 6 535 5000 Ext. 22802

Office Hours: Sun Tue Thu 9:00- 11:00 am

E-mail: o.ayadi@ju.edu.jo

Faculty Website: http://eacademic.ju.edu.jo/o.ayadi/default.aspx

Course Identification

Course Number: 0904453

Course Name: Refrigeration systems

Course Location: University Campus

Class Times: Sun Tue Thu 12:00am- 13:00pm

Prerequisites: Thermodynamics (2) - 0904342

Course Description/Overview

Basic definitions and concepts; review of vapor compression and absorption cycles; compressors, condensers, evaporators, expansion devices; refrigerants; cooling towers; components of an absorption cycles, controls..

Course Objectives

The course is intended to provide the student with the fundamental principles and operational characteristics of Refrigeration systems. This will be achieved through covering a wide range of related topics with the support of lab-based experiments.

Course Learning Outcomes

Upon successful completion of this course, will be familiar with the following:

11. Apply the first law of thermodynamics on the various psychrometric processes.
12. Apply the basic concepts of heat transfer, fluid mechanics and thermodynamics in the design of refrigeration systems.
13. Evaluate the refrigeration loads of cold stores, and design a suitable refrigeration system that satisfies the loads.
14. Understand the end user requirement for a refrigeration plant and design an appropriate refrigeration system.
15. Analyse the performance of the vapor compression and absorption cycles.
16. Understand the effect of the selection of Referigeration systems components materials on their performance.
17. Study the basic principles of the operation of compresssors and their types
18. Size and select the proper compressors and refrigeration plant components.
19. Apply the ASHRAE codes in the procedure of selecting design parameters.
20. Explain the vital rule of air conditioning systems on the life quality of humankind in residential and commercial buildings.

Course Resources

Course Website(s)

Required Course Texts and Materials

25. Wilbert F.Stoecker & Jerold W.Jones. Refrigeration and air-conditioning, McGraw-Hill, 2nd Int. edition, 1986.
26. Hand-outs prepared by the instructor.

Optional Course Texts and Materials

ASHRAE Handbook (Fundamentals volume)
https://www.ashrae.org/

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Assignments	10
Group Project	10
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time.Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion.According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses. No makeup for classwork.

Course Schedule

Week	Date	Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)
1-2		Introduction and applications of refrigeration and air conditioning
3		The vapor-compression cycle
4		Compressors
5		Condensers and evaporator
6		Expansion devices
7		Vapor-compression system analysis
8		Refrigerants: ozone depletion and new refrigerants
9		Multi-pressure systems.
11-15		Absorption Refrigeration Systems: Lithium Bromide and Aqua-Ammonia

Course Syllabus

0934445 Air Conditioning (1)

University of Jordan, Faculty of Engineering & Technology,

Mechanical Engineering Department

Fall Semester, 2014-2015

Instructor Information

Instructor:	Dr. Osama Ayadi
Office Location:	University Campus, Engineering Building, 2nd Floor
Office Telephone:	+962 6 535 5000 Ext. 22802
Office Hours:	Sun Tue Thu 9:00- 11:00 am
E-mail:	o.ayadi@ju.edu.jo
Faculty Website:	http://eacademic.ju.edu.jo/o.ayadi/default.aspx

Course Identification

Course Number:	0934445
Course Name:	Air Conditioning (1)
Course Location:	University Campus
Class Times:	Mon Wen 9:30am- 11:00pm
Prerequisites:	Heat Transfer (1) – 0904441 & Thermodynamics (2) - 0904342

Course Description/Overview

Review of psychrometry. Air conditioning processes. Thermal comfort, Inside and outside design conditions. Ventilation and infiltration. Heating load calculations. Solar radiation, cooling load calculations. Water heating systems layout and design. Air systems design. Underfloor heating.

Course Objectives

The course is intended to provide the student with the fundamental principles and operational characteristics of Refrigeration systems. This will be achieved through covering a wide range of related topics with the support of lab-based experiments.

Course Learning Outcomes

Upon successful completion of this course, will be familiar with the following:

21. Apply the first law of thermodynamics on the various psychrometric processes.
22. Apply the basic concepts of heat transfer, fluid mechanics and thermodynamics in the design of air conditioning systems.
23. Evaluate the heating loads of a building, and design a suitable air conditioning system that satisfies these loads.
24. Understand the architectial plans of a building and desing the optimal air conditioning system for it.
25. Analyse the performance of the vapor compression cycle used for air conditioning systems.
26. Understand the effect of the selection of building materials on the building behavior.
27. Size the air ducts for war air heating and calculate the pressure drop in the system.
28. Size and select the proper fan and other air conditioning plant components.
29. Apply the Jordanian local codes and the ASHRAE codes in the procedure of selecting design parameters.
30. Explain the vital rule of air conditioning systems on the life quality of humankind in residential and commercial buildings.

Course Website(s)

Required Course Texts and Materials

27. A.Alsaad M. & Hammad M. Heating and air conditioning for residential buildings, Ajial press, 5th Int. edition, 2011.
28. Hand-outs prepared by the instructor.

Optional Course Texts and Materials

National Building Code of Jordan. (1990) Jordanian code for central heating https://www.ashrae.org/

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Assignments	10
Group Project	10
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time.Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion.According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses. No makeup for classwork.

Course Schedule

Week	**Date**	**Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)**
1-2		Introduction and applications of refrigeration and air conditioning
3		The vapor-compression cycle
4		Compressors

5		Condensers and evaporator
6		Expansion devices
7		Vapor-compression system analysis
8		Refrigerants: ozone depletion and new refrigerants
9		Multi-pressure systems.
11-15		Absorption Refrigeration Systems: Lithium Bromide and Aqua-Ammonia

Course Syllabus

0904589 Energy Conversion

University of Jordan, Faculty of Engineering & Technology,

Mechanical Engineering Department

Fall Semester, 2014-2015

Instructor Information

Instructor:	Dr. Osama Ayadi
Office Location:	University Campus, Engineering Building, 2nd Floor
Office Telephone:	+962 6 535 5000 Ext. 22802
Office Hours:	Sun Tue Thu 9:00- 11:00 am
E-mail:	o.ayadi@ju.edu.jo
Faculty Website:	http://eacademic.ju.edu.jo/o.ayadi/default.aspx

Course Identification

Course Number:	0904589
Course Name:	Energy Conversion
Course Location:	University Campus
Class Times:	Mon Wen 9:30am- 11:00pm
Prerequisites:	0904342: Thermodynamics-2

Course Description/Overview

Energy classification, resources and utilization; Principal fuels for energy conversion; Production of thermal energy; Fossil fuel systems; Environmental impact of power plant operation; Production of electrical energy(by direct energy conversion); Wind energy; Solar energy; geothermal energy; Energy storage and conservation.

Course Objectives

The course is intended to provide the student with the fundamental principles of energy and its conversion. This will be achieved through covering a wide range of related topics with the support of lab-based experiments.

Course Learning Outcomes

Upon successful completion of this course, will be familiar with the following:

1. Identify energy consumption and utilization features on the global, regional and local levels.
2. Predict energy consumption in a certain country given the growth rate is known.
3. Figure out various properties, including the heating values for a mixture of gaseous, liquid and solid fuels.
4. Calculate theoretical and actual air/fuel ratios for the combustion of various kinds of fuels, especially coals, given their analysis are known.
5. Select basic draft systems for a power plant.
6. Estimate solar radiation on any surface.
7. Select a solar collector for a given job.
8. Size and select a windmill for a given job.
9. Assess environmental impact of power plant operation.
10. Analyze and calculate energy costs for a certain power plant and find the breakeven point for that plant.
11. Estimate boiler efficiency.

Problems, Quizes and Exams may include various units from English and SI systems.
Report is required about a certain aspect of energy utilization
All exams and quizzes are open book.
Ability to solve problems, quizes and exams in English and SI systems.

Course Website(s)

http://oayadi.wix.com/course

Required Course Texts and Materials

29. Archie W. Culp. Principles of Energy Conversion, McGraw-Hill. 2nd edition, 1991.
30. Badran. A. Renewable Energy: Sun, Wind and Water (in Arabic) , A paper presented at the 6th. Science week, Conducted by the Higher Council for Science and Technology., 1996

Optional Course Texts and Materials

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Assignments	10
Group Project	10
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time.Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion.According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses. No makeup for classwork.

Course Schedule

Week	**Date**	**Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)**
1, 2		1-Energy classification, resources and utilization.
3, 4		2- Principal fuels for energy conversion.
5,6,7		3- Production of thermal energy.
8,9,10		4- Fossil fuel systems.

11,12		5- Environmental impact of power plant operation.
13		6- Production of electrical energy(by direct energy conversion).
14		7- Wind energy.
15		8- Solar energy.

CLIMASP Project

Mapping Courses from Economics & Public Policy Group
University of Jordan

Course Classification:

5. Core Courses (*for All Euro Pass Candidates*)
6. Elective Courses (*from Student Major or Group*)
7. Capstone Course
8. Additional Elective Courses

Core Courses:

*Two courses (6 Credit Hours), one from each other groups as in the following Table:

Group	Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category
Environment and Society	2305100	Introduction to Sociology	---	Sociology	Arts	University Elective
Economics and Public Policy	1607100	**International political economy	---	Business Economic	Business	University Elective
Science and Technology	0305100	Environment	---	Geology	Science	University Elective

Elective Courses:

Two programs from the Economics and Public Policy are involved, namely, Business Economics and Finance. Six courses (18 Credit Hours) may be taken by student from his major or other majors within the group.

Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category
1607330	International Trade Theory	1607110	Business Economics	Business	Dept. Core
1607415	Economic development	1607111	Business Economics	Business	Dept. Core
1607431	International Finance	1607111	Business Economics	Business	Dept. Core
1607411	Contemporary Economic Issues	1607111	Business Economics	Business	Dept. Core.
1607225	Industrial Economics	1607110	Business Economics	Business	Dept. Core.
1607421	Managerial Economics	1607110	Business Economics	Business	Dept. Core.
New course	Environmental Economics	-	Business Economics	Business	Dept. Elective

1603450	Contemporary Issues in Finance	1603301	Finance	Business	Dept. Core
1603416	Financial Planning and Control	1603211	Finance	Business	Dept. Elective
1603315	**Entrepreneurship in Finance**	1603211	Finance	Business	Dept. Elective
1603444	**Risk Management**	1603443	Finance	Business	Dept. Elective

Capstone Course:
This course is based on design and/or practical training for senior students. Depending on the student major, the following courses fit as capstone course provided the training is conducted in the field of climate change and environmental sustainability. 6 Credit Hours.

Course Code	**Course Title**	**Prerequisite**	**Department**	**Faculty (College)**	**Course Category**
0300150	Community Service	---	Business economics	Business	University Requirement
1607311	Scientific Research in Economics	1607150	Business Economics	Business	Department Core

Additional Elective Courses
The following list contains courses than can be taken by student in case he/she wishes to diversify knowledge or unable to register in elective courses offered by his/her Department.

**A student cannot register in a university elective course offered by the Department of his/her major.
*****The student will take 8 Courses (24 hrs). Student will take 6 courses from her/his field and the other 2 courses will be from the core courses. With the 6 hrs capstone course the total credit hours are 30 hrs.**

Core Course:

Group	Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category
Economics and Public Policy	1607100	**International political economy	---	Business Economic	Business	University Elective

(1)

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus
International Political Economy
The University of Jordan, The School of Business, Department of Business Economics

Instructor Information

Instructor:

Office Location: The School of Business / Business Economics Department -Building #1 First Floor.
Telephone: 5355000 ext.
Office Hours:
E-mail:

Course Identification

Course Number: 1607100
Course Name: International Political Economy
Course Location:
Class Times:
Prerequisites: None
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This course seeks to explore the interaction of economics and politics in global affairs- the struggle for power and wealth within the international system. The course begins by identification of the economic science and economic problem, the development of economic thought across different economic schools, concentrating on their different standpoints regarding the role of the government in the economic activity. The course aims also to study and analyze different economic systems and their characteristics.

Special emphasis will be placed on the international dimension of political economy, focusing on the interconnected political and economic structures of the world and considering the undergoing enormous change, in order to understand the key elements of this change and see which paths lead to the most promising future. While the questions of international monetary, financial and trading systems are of particular importance, other topics of interest include: the flow across borders of goods, capital, foreign investment and migration ;role of multinational corporations, regional economic organizations and their role in economic integration, environmentally sustainable development, climate change, and prospects for welfare as an economic, political, technological and socio-cultural ongoing process.

Course Learning Objectives

The main goals of this course are to:

- Raise awareness that neither international politics nor international economics can be understood in isolation.
- Focus attention on the four types of cross-border flows (goods, capital, .investment and migration),and the polices- set forth by domestic and international institutions and arrangements- that regulate these flows.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- Knowledge and Understanding:**

A1) Understand the major theoretical perspectives on international political economy, the assumptions concerning appropriate unit analysis and nature of interactions between units on which they are based, and their implications for policy.
A2)) Learn how economic organizations on the national and international levels compete and integrate with each other.
A3) Understand the importance of the ecological constraints on economic growth and development.
A4) Try to investigate the extent of the Jordanian economy to influence and be affected by the world economy.

LO **2- Analytical and Thinking Skills**:

Students should have the ability to:

B1) Indentify and evaluate institutional, political, cultural and economic constraints on the speed and effectiveness of political and/or economic positive change in developing countries.

B2) Collect and analyze relevant data associated with international political economy.

LO **3- Teaching and Learning Methods**:

- Lectures, dialogue and discussion.
- Research.
- Cooperative learning.
- Brain – storming.

Course Resources

Course Website(s)

- http://blackboard.ju.edu.jo

Required Course Texts and Materials

- **Balaam, David N. , and Bradford Dillman.. " *Introduction to International Political Economy* " 5th ed. Longman 2010.**
- **Oatley, Thomas.2011. " *International Political Economy*", 5th Edition. New york, Longman.**
- **Joseph E. Stiglitz " *Globalization and its Discontents*, " New York : Norton, 2002.**

Optional Course Texts and Materials

-

Assignments and Grading Scheme

Grading System

A , A- **Excellent**
B+ , B, B- **Very good**
C+, C, C- **Good**
D+ , D, D- **pass**
D-, F = **Fail**

Grading Policy

Grades can be based on the following :

Attendence	**5 %**
Mid-term exam	**30%**
Final exam	**50%**
Participation in the seminars	**10%**
Short Paper	**5%**
Total	**100%**

Course Policies

University Policies regarding class attendance, course pre-requisites, and academic Honesty, dropout, grading, incompletes, and final exams will be observed as stated in the University of Jordan. You are responsible for all material discussed in class and assigned in the textbook. Missing class is strongly discouraged. Your professor is far less sympathetic to those who miss class regularly. If you miss class, you are responsible to get the notes from a classmate.

Any type of academic misconduct will result in (F). By Enrolling in this course, you agree with the University of Jordan Policy on Academic Misconduct.

Course Schedule

Week	Material
1	Introduction and basic concepts
2	Definition of economic science and economic problem
3+4	Development and analysis of different schools of economic thought
5+6	Economic systems + first exam
7	Sustainable global development
8	Financial systems and fiscal policy
9+10	International finance, third world debt and the macroeconomic stabilization controversy
11	Trade policy, regional and world trade organizations
12	Direct foreign investment and foreign aid
13	The global environmental threat
14	Climate protection
15	Final Exam

Elective Courses syllabi:
(2)

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus
International Trade Theory
The University of Jordan, The School of Business, Department of Business Economics

Instructor Information

Instructor: Buthaina M.A.Muhtaseb, Associate Professor
Office Location: The School of Business / Business Economics Department -Building #1 first floor.
Telephone: 5355000 ext. 24839
Office Hours:
E-mail: b.muhtaseb@ju.edu.jo, b.muhtaseb@yahoo.com

Course Identification

Course Number: 1607330
Course Name: International Trade Theory
Course Location:
Class Times:
Prerequisites: Principles of Microeconomics (1607110)
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This courses analyzes the causes and consequences of international trade. Various theories of international trade and its extensions will be explained and evaluated in both perfect and imperfect competition, with some reference to the empirical evidence. Some of the essential questions that will be addressed: Why do countries trade? Are countries better off because they trade? Are both trading partners better off? Who gains and who loses within a country? What is the relation between trade and growth? What if markets don't work perfectly? How does that affect our assessments?

Course Learning Objectives

1-To introduce students to international economic concepts and ideas.
2- To develop the ability to reason accurately and objectively about international economic issues.
3- To aid students in judging what kinds of decisions, policies, and behavior are sensible from an international perspective.
4- Enable students to understand international trade flows incentives, directions, and effects.
5- To highlight the relation between international trade and economic growth and welfare. (Welfare should not be measured by the rise in consumption only. Other aspects as good social relations, and clean nature should be considered).

Course Content Learning Outcomes (ILOS)

Successful completion of this course should lead to the following learning outcomes:
LO1- Knowledge and Understanding:
A1) Understand basic concepts of foreign trade.
A2) Demonstrate knowledge and understanding of different international trade theories
A3) Understand foreign trade structure of Jordan
A4) Describe and understand the links between foreign trade and growth
A5) understand international trade under different market structures (competitive versus noncompetitive markets)

LO2- Intellectual Skills:

B1) Prepare and present reports using critical thinking, trade data, and international trade theories
B2) Explain the mechanisms of international flows of commodities and factors
B3) Relate local economic developments to international economic developments
B4) Use computers and internet to access trade flows data and sources.

LO3- Subject Specific Skills:
C1) Apply international trade theories to relate domestic equilibrium prices to foreign prices
C2) Employ trade models to analyze the effects of trade on production, prices and terms of trade, and economic growth
C3) Use micro and macro-economic tools to assess net gains from international trade
C4) Develop the skills required to relate domestic economy equilibrium/disequilibrium to domestic and foreign influences
C5) Analyze international commodities flows directions and causes, and explain migration incentives and disincentives.

LO4- Transferable Skills:
D1) Gather data for basic economic research from various sources, including the computer and other forms of electronic media, such as the Internet.
D2) Acquire English language command of international trade concepts and definitions.
D3) Demonstrate knowledge and skills necessary for integrating information technology into global trade**.**

Teaching and Learning Methods

Duration: 16 weeks, 48 hours in total
Lectures: 28 hours, 3 per week (including two 1-hour midterm exams)
Case study: 8 hours
Tutorials: 6 hours
Applications: 6 hours
Laboratory: -

Teaching Methods					
Methods	**Lectures**	**Case study**	**Tutorials**	**Laboratory**	**Applications**
Objectives learning outcomes	A1 A2 A3 A4 A5 B2 B3 B4 C1 C2 C3 C4 C5 D2	A3 A5 B1 B4 C4 D1 D3	A3 A4 A5 B1 B4 C2 C5 D1	-	A2 A4 A5 B3 C1 C2 C3 C5 D1 D3
Assessments	Exams + Assignments	Exams + Assignments	Project + Assignments	Project + Assignments	Exams + Assignments

Materials

To be assigned later in class

Assignments and Grading Scheme

Mid-term Exam	**30%**
Short Paper (1)	**7%**
Participation/Attendance	**5%**
Quiz	**8%**
Final Exam	**50%**
Total	**100%**

Course Requirements

Course Website(s)

- http://blackboard.ju.edu.jo

Required Course Texts and Materials

- Awad Talib***, "International Trade: Theory and Policy" ,*** The University of Jordan, Amman, 1995.
- Krugman R. Paul and Obstfeld Maurice, "***International Economics: Theory and Policy***", seventh Edition. Boston: Addison-Wesley, 2008

Optional Course Texts and

Course Policies

Academic Honesty

All the assignments and work submitted by the student should be his or her own. All actions of academic dishonesty including cheating, plagiarism or helping other students in such actions will be dealt with strictly according to the university regulations.

Course Schedule

Week	Materials
1	Unit 1: Introduction to International Economics -Causes of trade. -Patterns of trade. -Gains from trade. * Fair Trade. * Drawbacks of Free Trade
2+3+4	Unit 2: Labor Productivity and Comparative Advantage - Dynamic comparative advantage and ethics. **+** **Exam 1**
5+6+7	Unit 3: Resources and Trade: The Heckscher-Ohlin

	Model - The role of resources in explaining foreign trade. - The concept of sustainability and its relation to natural resources. - Each generation should leave the environment not worse off, and not damaged by depletion of resources or pollution of land, water and atmosphere.
8+9	Unit 4: The Standard Trade Model - Income Distribution (Who gain and who loses from free trade within a country? - Trade Development and Growth * Interaction between the three dimensions of development : economic, social and environmental. * Growth and sustainability (Is the traditional macroeconomic goal of economic growth compatible with the long term goal of sustainability?) - Trade and the environment * Analysis combining trade theory with the theory of externalities to show how the basic principle of gains from trade must be modified in a real world with many environmental complications. * The issues of sustainable trade and "greening" global environment institutions encourage the student to place the theoretical issues in the context of real – world policy.

10+11	Unit 5: Modern Theories of International Trade: Economies of Scale, Imperfect Competition, and International Trade. - The Gravity Modal (The role of language, history and culture in addition to other factors in enhancing exports and imports. **+** **Exam 2**
12	Unit 6: International Factor Movements -Immigration -Multinational Enterprise - Linkages between international Labor and capital mobility (Investor rights, Labor standards).
13+14	Unit 7 : Trade Polices and Trade Agreements - Tariffs and Quotas. - Some nontariff barriers are unfair(Indirect way of developed countries to reduce imports from

	developing countries) - Trade liberalization and the WTO, IMF, WB (suspicious roles?)
15	Unit 8 : Application on Foreign Trade to Jordan - Real cases (trade and the environment in Jordan). - Computation of "terms of trade" of Jordan, their change over time and the impact of this change on welfare" **+** **Exam 3 (Final): Cover all units with higher weights given to units not covered in the previous exams.**

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Economic Development

University of Jordan, Faculty of Business, Department of Business Economics

Instructor Information

Instructor:
Office Location: Faculty of Business / Business Economic Department -Building #1 first floor.
Telephone: 5355000 ext. 24163
Office Hours: Day(s) time Sun., Tues. & Thur. 12:00-1:00
Mon. & Wed. 11:00-12:00
E-mail: khawlah.spetan@ju.edu.jo, khawlahs2000@yahoo.com

Course Identification

Course Number: 1607415
Course Name: Economic Development
Course Location: University Campus
Class Times: Mon, Wed 12:30-2:00
Prerequisites: 1607111 Principle of Macroeconomics
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This course introduces the theory of growth and economic development, providing a qualitative and analytical perspective of economic transformation of developing countries for undergraduate students. It tries to provide an explanation for the exceptional progress that has been made in many parts of the developing world, but fully deals with the massive problems and challenges that remain to be addressed in the years ahead. It explains measurements of and obstacles to growth and development and tries to explore the difficulties that confront the sustainable development policies. The module focuses on the theory of growth and development and its interaction with trade, population, poverty, and income distribution. The pace and extent of economic development continues its prompt, imbalanced, and sometimes unexpected evolution. The course has been divided into two parts, the first part is about concepts and principles and includes three sections; an introduction of economic development from global perspective, comparative economic development and analysis of convergence, and Classic theories of economic growth and development. The second part is about problems and polices that faces the development in less developing countries; poverty inequality and development, Population Growth and Economic Development and finally the environment and development, basic issues in Global warming and climate change and its fallout on economic development.

Course Learning Objectives

- The main objectives of this course are: 1) to offer an analytical approach to the concepts related to growth and economic development in the context of sustainable development. 2) to equip students with appropriate tools and techniques that help them to analyze situations related to growth and development such as poverty and inequalities .... 3) draw the attention to some issues in environmental pollution and global economic and its relation with economic development. 4) realize the climate change consequences on sustainable economic development. 5) to provide students with the resources to draw independent conclusions as they confront development problems.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- knowledge and understanding:**

- Understanding different theories related to economic development
- Comparing developing and developed countries experiences.

- Understanding the aims of development and how to reach them through the different sectors of the economy.
- Classifying the stages of economic development.
- Identifying the problems related to sustainability and the impact of climate change in economic development over time.

LO **2- analytical and thinking skills**:

Students should have the ability to:

- Comparing theories and finding the best suitable one which can be applied in Jordan economy.
- Developing some of the core models in poverty and inequality measurement and analysis.
- Highlighting and developing some of the core models in microeconomics of fertility and relationships between population growth and economic growth.
- Discuss the relationship between the environmental economics models and the sustainable economic development.

LO **3- Teaching and learning methods**:

- There will be 2 lectures per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical and the qualitative cases presented in the book.

- A number of problems (end-of-chapter problems) will be indicated in class, to be submitted by students. Students should do the homework and should come to class prepared to discuss the assigned problems.

Course Resources

Course Website(s):

- http://www.global-economic-symposium.org/knowledgebase/the-global-environment/climate-change-and-economic-development.

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class.
- Todaro, M. and S. Smith, Economic Development, 11th edition,2012
- **Robert E. LUCAS, Jr., On the Mechanics of Economics Development,** University of Chicago, Chicago, 1L 60637, USA,1988.
- Human Development Report 2011. Sustainability and Equity: A better future for All, UNDP.
- Anthony D. Owen & Nick Hanley, The Economics of climate Change, Routledge,2004.
- **http://www.unep.org/pdf/ourplanet/op_english_17v2.pdf**
- **https://environment.yale.edu/files/biblio/YaleFES-00000397.pdf**
- فايز ابراهيم الحبيب، نظريات التنمية والنمو الاقتصادي
- سالم النجفي، مقدمة في اقتصاد التنمية
- عبد الوهاب الأمين، التنمية الاقتصادية: السيسات والمشكلات
- تقرير حالة الفقر في الأردن، إستناد اً لبيانات مسح نفقات ودخل الأسرة،2010، دائرة الإحصاءات العامة، الأردن.

Assignments and Grading Scheme

Grading System

A , A- **Excellent**
B+ , B, B- **Very good**
C+, C, C- **Good**
D+ , D, D- **pass**
D-, F = **Failure**

Grading Policy

Students will be assessed based on the following:
Mid-term Exam 30%

Second exam 7%
Participation 5%
Short Paper 8%
Final Exam 50%
Assignments are individual assignments. Details of these assignments and the submission deadlines will be announced in class.

Course Policies

Late Assignments policy

All assignments are due at the beginning of class. Anything turned in after that will be considered late. Assignments will be accepted up to four days after the due date for half credit. Assignments will not be accepted after the four-days extension. Excessive absenteeism and late or missing work will effect in lowered grades. Contact with your teacher is strongly encouraged especially when you have been absent. In addition, please see handout on the college's policy on absence and make-up work.

Classroom Protocol

We oblige ourselves to a high standard of professional behavior. Accordingly, lateness, holding private conversations and indeed any behavior that interrupts me or your colleagues will be considered improper. Using cell phones is forbidden in the class. Repeated violations of this standard may affect your participation grade or may cause withdrawal from course.

Course Schedule

Detailed lecture schedule			
Homework and Assignments	**Material:**	**Week:**	
TBA	Ch 1: Introduction	Week 1+2	

TBA	Ch 2:Comparative economic development First Exam	Week 3+4	
TBA	Ch 3:Classic theories of economic growth and development	Week 5+6	
TBA	Ch 5: Poverty, inequality and development Second Exam	Week 7+8	
TBA	Ch 6: Population growth and economic development	Week 9+10	
TBA	Ch 10: Environmental and Economic Development	Week 11+12	
TBA	Climate Change and its consequences on Economic Development	Week 13+14	
TBA	Final exam	Week 15	

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

1607421: International Finance

University of Jordan, Faculty of Business, Department of Business Economics

Spring, 2014

Instructor Information

Instructor:	Khawlah A. Abdalla Spetan, Assistant Professor
Office Location:	Faculty of Business / Business Economic Department -Building # first floor
Telephone:	5355000 ext. 24163
Office Hours:	Day(s) time: Sun., Tues. & Thur. 10:00-11:00 Mon. & Wed. 1:45 -2:15
E-mail:	khawlah.spetan@ju.edu.jo, khawlahs2000@yahoo.com

Course Identification

Course Number: 1607421
Course Name: International Finance
Course Location:
Class Times: Monday & Wednesday 11:00 – 12:15
Prerequisites: 1607111, Macroeconomics principles
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This is a course in international monetary economics, which includes the connection between the exchange rates and international macroeconomic policies. The subject of international finance draws its importance from the consequences of worldwide economic policies on a country economy's main outcomes (Employment, National Saving, Trade Balance and Price levels and Money). The course divided into three parts: The first part of the course will present several theories of exchange rate, and the second part will help you gather these theories into an overall analytical framework. The third part will challenge you to employ this analytical framework to real-world applications, and try to link the global financial crisis and the climate change issue. Provide students an up-to-date and understandable analytical framework for revealing current events. Help them grasp and retain the underlying logic of international finance through six to seven sections; first section we will talk about the national income accounts an d balance of payments, second section will be about the asset approach of exchange market and foreign exchange market, third section is about money market and inflation and exchange rate dynamics. In the fourth section the student will try to explore the causes of the fluctuations in exchange rate in long and short runs periods. The fixed exchange rates system will be introduced in section five. And finally in sixth section we will discuss the international macroeconomic policy and try to connect the causes of financial crisis with the most contemporary issue the climate change and their interaction.

Course Learning Objectives

The objectives of this course are: 1) introduce the main exchange rates theories and its determinants and understand the role of exchange rates in international trade . 2) students will understand the movements in macroeconomic variables such as the trade balance, the exchange rate, money, interest rate, national output, and inflation, in short and long runs. 3) Understanding how the interactions of national economies influence the worldwide pattern of macroeconomic activity.4) explore the various international currency arrangements and how did countries try to attain internal and external balance. 5) explain the linkages between the financial crisis and the environmental economics specifically the climate change issue.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- knowledge and understanding:**

- Understand the basic theory of international macroeconomics and finance.
- Understand the determination of the exchange rates in foreign exchange markets.
- Understand why exchange rates can change dramatically over periods of several years.
- Understand the complicated factors that cause output, exchange rates, and inflation to change in the short-run.
- Understand the role of the central bank foreign exchange intervention in the determination of the exchange rates under fixed and managed floating system.
- Understand how the international monetary system influenced the macroeconomic policy making during certain periods.
- Understand the performance and policy problems of the global capital market.
- Understand the international finance of climate change from different perspectives.

LO **2- analytical and thinking skills**:

Students should have the ability to:

- Analyze, in an unbiased way, a wide array of important international policy issues.
- Analyze the exchange rates movements in the modern theory of floating exchange rates.
- Relate mathematical and identification models to their assumptions and to the real world.
- Predict in somehow financial crises.

- Link the financial crisis with global warming proplem (climate change issue)

LO **3- Teaching and learning methods**:

- There will be 2 lectures per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical cases presented in the book.

- A number of problems (end-of-chapter problems) will be indicated in class, to be submitted by students. Students should attempt the homework and should come to class prepared to discuss the assigned problems.
- Case studies reinforcing material covered, illustrating its applicability in the real world.

Course Resources

Course Website(s)

- http://blackboard.ju.edu.jo
- http://www.facebook.com/groups/106367372820252
- www.cbj.gov.jo
-

Required Course Texts and Materials

- (International Economics: Theory and Policy) 8th edition, 2009. Addison Wesley, by Paul Krugman and Maurice Obstfeld.
- Climate Change and the Global Financial Crisis, Robin Leichenko, Karen O'Brien and William Solecki**.**

Climate change and the financial crisis: A case of double Exposure**,** Robin M. Leichenko, Karen L. O'Brien, and William D. Solecki**,** *Annals of the Association of American Geographers*, 100(4) 2010, pp. 963–972 C, Published by Taylor & Francis, LLC.

- The economics of climate change, Anothony D. Owen, Nick Hanley,2004.
- International Climate Change Financing: The Green Climate Fund (GCF). Richard K. Lattanzio Analyst in Environmental Policy, Congressional Research Service April 16, 2013.
- The Effect of the Global Financial Crisis on Climate Change, Imogen Reed. Posted on April 13, 2012 .
- Climate Change May Trigger the Next Financial Crisis.
- What is the impact of the economic crisis on the climate change debate? Question submitted by Soumaya Maghnouj, from Sciences-Po, March 22, 2013 Answered by: Daniel P. Ahn, Adjunct Fellow for Energy

- التجارة الدولية نظريات و سياسات، الدكتور طالب عوض، 1995

Optional Course Texts and Materials

- Peterson Institution for International Economics (http://www.piie.com).

Assignments and Grading Scheme

Grading System

A , A- **Excellent**
B+ , B, B- **Very good**
C+, C, C- **Good**
D+ , D, D- **pass**
D-, F = **Failure**

Grading Policy

Students will be assessed based on the following:

Mid-term Exam 30%
Second exam 7%
Participation 5%
Short Paper 8%
Final Exam 50%
Assignments are individual assignments. Details of these assignments and the submission deadlines will be announced in class.

Course Policies

Late Assignments policy

All assignments are due at the beginning of class. Anything turned in after that will be considered late. Assignments will be accepted up to four days after the due date for half credit. Assignments will not be accepted after the four-days extension. Excessive absenteeism and late or missing work will effect in lowered grades. Contact with your teacher is strongly encouraged especially when you have been absent. In addition, please see handout on the college's policy on absence and make-up work.

Classroom Protocol

We oblige ourselves to a high standard of professional behavior. Accordingly, lateness, holding private conversations and indeed any behavior that interrupts me or your colleagues will be considered improper. Using cell phones is forbidden in the class. Repeated violations of this standard may affect your participation grade or may cause withdrawal from course.

Course Schedule

Detailed lecture schedule			
Homework and Assignments	**Material:**	**Week:**	
TBA	-Introduction Ch (12): National Income Accounting	Week 1+2	

	and the Balance of Payments.		
TBA	Ch (13):Exchange Rates and the Foreign Exchange Market.	Week 3+4	
TBA	Ch (14):Money, Interest Rates, and Exchange Rates. First Exam	Week 5	
TBA	Ch (15):Price Levels and the Exchange Rate in the Long-R.	Week 6	
TBA	Ch (16): Output and the Exchange rate in Short-R.	Week 7	
TBA	Ch (17): Fixed Exchange Rates and Foreign Exchange Intervention +second exam	Week 8+9	
TBA	Ch (18): The International Monetary System, 1870-1973.	Week 10	
TBA	Ch (21): introduction to climate change problem	Week 11+12	
TBA	Ch (22): Developing Countries: Growth, Crisis, global warming and climate change.	Week 13+14	
TBA	Final exam	Week 15	

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus
Contemporary Economic Issues
The University of Jordan, the School of Business, Department of Business Economics

Instructor Information

Instructor:
Office Location: The School of Business / Business Economics Department -Building #1 First Floor.
Telephone: 5355000 ext.
Office Hours:
E-mail:

Course Identification

Course Number: 1607411
Course Name: Contemporary Economic Issues
Course Location:
Class Times:
Prerequisites: 1607210 and 1607211
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This course is primarily concerned with contemporary economic issues at the domestic, regional and international levels. Specific topics are chosen from current and recent policy debates.

Course Learning Objectives

The main objective of this course is to augment the students' comprehension of the various contemporary economic issues which arise in the world, and analyze their negative and positive effects on the Jordanian community.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- Knowledge and Understanding:**

A1) understand the new and important contemporary economic issues.
A2) understand the problems and reasons that are associated with economic issues.
A3) realize the importance of the issues of environmental economics and climate change.

LO **2- Analytical and Thinking Skills**:

Students should have the ability to:

B1) collect and analyze relevant data associated with contemporary economic issues.
B2) perform basic analytical techniques and operations in the context of economic issues.
B3) comprehend and communicate positively and effectively data presented in dialogue forums.
B4) develop analytical skills through class presentations, discussions and writing research papers.
B5) apply microeconomic and macroeconomic analysis to evaluate a current public policy.

LO **3- Teaching and Learning Methods**:

Lectures, case studies, problem solving and tutorials.

- Lectures: 7 weeks, 21 hours
- Discussion forums: 7 weeks, 21 hours
- Tutorials: 2 weeks, 6 hours
- Applications (office hours): as requested

Course Resources

Students should use course description as general guidelines. Book lists and syllabi are subject to change.

Because the course focuses on current economic issues, students will be asked to supplement the chosen textbooks with readings from newspapers, magazines, and the internet

Course Website(s)

- http://blackboard.ju.edu.jo

Required Course Texts and Materials

Although the complete list of references and textbooks materials will be assigned during the course, these books are required:

- **Bonello, Frank J. And Isobel Lobo, *Taking Sides : Clashing Views on Economic Issues*. 15th Edition. McGraw Hill, 2012.**
- **Robart, C.Guell, *Economics Today*, sixth edition, McGraw Hill, 2010.**
- **Anothony D. Owen, Nick Hanley, *The Economics of Climate Change*,2004.**

Optional Course Texts and Materials

- **Nick Hanley, Jason Shogren, and Ben White, *Introduction to Environmental Economics***

Assignments and Grading Scheme

Grading System

A , A- **Excellent**
B+ , B, B- **Very good**
C+, C, C- **Good**
D+ , D, D- **pass**
D-, F = **Fail**

Grading Policy

Students will be assessed based on the following:

Mid-term Exam	30%
Second exam	7%
Participation	5%
Short Paper	8%
Final Exam	50%

Assignments are individual assignments. Details of these assignments and the submission deadlines will be announced in class.

Course Policies

University Policies regarding class attendance, course pre-requisites, and academic honesty, grading, incompletes, and final exams will be observed as stated in the University of Jordan. You are responsible for all material discussed in class and assigned in the textbook.

Missing class is strongly discouraged. Your professor is far less sympathetic to those who miss class regularly. If you miss class, you are responsible to get the notes from a classmate.

Any type of academic misconduct will result in (F). By Enrolling in this course, you agree with the University of Jordan Policy on Academic Misconduct.

Course Schedule

The contents of this course will be determined according to the economic issues that arise during a particular time period.

Below is a proposed list of some topics. We do not want to make this a formal Schedule because we want to be able to introduce topics as they arise. This may mean introducing new topics or shifting the order of the topics we have already chosen.

Detailed lecture schedule			
Homework and Assignments	**Material:**	**Week:**	
TBA	-Introduction World recession / recovery	Week 1+2	
TBA	Globalization.	Week 3+4	
TBA	Poverty and sustainable development First Exam	Week 5	
TBA	Assessment of the Greater Arab Free Trade Area.	Week 6	
TBA	Environmental justice: income, race	Week 7	

	and health		
TBA	The transition to renewable energy. +second exam	Week 8+9	
TBA	The economics of climate change	Week 10	
TBA	Developing countries and climate change.	Week 11+12	
TBA	Climate change Cost –benefit analysis	Week 13+14	
TBA	Final exam	Week 15	

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CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Industrial Economics

University of Jordan, Faculty of Business, Department of Business Economics

Instructor Information

Instructor: Nahil I. Saqfalhait, Associate Professor
Office Location: Faculty of Business / Business Economics Department -Building #2, second floor.
Telephone: 5355000 ext. 24172
Office Hours: TBD
E-mail: nahil.saqfalhait@ju.edu.jo

Course Identification

Course Number: 1607225
Course Name: Industrial Economics
Course Location: TBD
Class Times: TBD
Prerequisites: Principles of Microeconomics (1607110)
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

Industrial organization is essentially a branch of applied microeconomics which seeks to understand the causes and effects of various market structures on pricing and product choices. The course focuses on the theory of the firm and the industry in imperfectly competitive markets with an emphasis upon oligopoly theory, but it also addresses empirical applications of the theory. The course explains how firms compete with each other; it models firms' strategies on imperfect markets and derives the impact of firms' behavior on welfare and market structures.

We will analyze market structure, firm conduct, and economic performance of industries. Of special interest is firms' strategic behavior in price and non-price competition. The types of behavior, or conduct, include oligopoly pricing and production, strategic entry deterrence, location strategies, product differentiation, advertising, vertical and horizontal integration, and research and development. The effects of firms' conduct upon economic welfare and feedback effects upon market structure are examined. Moreover, we will analyze the acquisition and use of market power by firms, antitrust law or/and the role of government competition policy.

We will also look at how institutions and industry can shape improvements in environmental quality and support efficient allocations of resources.

Course Learning Objectives

This module aims at providing students with major topics in the field of Industrial Organization. The knowledge that the student will derive from the course is useful for further study of firms and markets as well as the study of effects of regulatory and legal systems (such as antitrust law or competitive policies) upon firms. The knowledge is also useful in further study of the internal operation of firms. Topics covered in this course are useful not only for academic consideration, but also in private enterprises, including financial and legal institutions; in government regulatory agencies; and in international trade.

Course Content Learning Outcomes

Upon the completion of this module, students should be able to achieve the following:

LO **1- knowledge and understanding:**

Students should have knowledge of:

- The definition, measurement and analysis of various key elements of industrial organization.
- Why markets are organized as they are and behave in the way they do.

- Models of competitive, oligopolistic, and monopoly markets.
- The basic dimensions of industries structure, conduct, and performance.
- Price and non-price competition among firms.
- The acquisition and use of market power by firms.
- Role of government competition policy and regulation.
- Industrial environmental economics issues.

LO **2- analytical and thinking skills**:

Students should have the ability to:

- Analyze and evaluate models of competitive, oligopolistic, and monopoly markets.
- Analyze and evaluate how firms' structure and conduct affect economic welfare and how these results feed back to effect structure and conduct.
- Explain the various types of industry structures, conduct, and performance; business strategies; and policy alternatives.
- Understand how firms make their decisions based on strategic thinking.
- Discuss theoretical and empirical issues relating to the interactions among firms in a market economy.
- Apply basic concepts of economic analysis of market structures and understand current debates concerning plausible reform of competition policy.
- Evaluate antitrust policies and other government regulations of industry.
- *Analyze environmental issues through a deeper understanding of firms' economic behavior and incentives.*

LO **3- Teaching and learning methods**:

- There will be 3 hours per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical cases presented in the book.
- A number of problems will be indicated in class, to be submitted by students. Students should attempt the homework and should come to class prepared to discuss the assigned problems.

Course Resources

Course Website

- http://blackboard.ju.edu.jo

Main textbook(s) and additional readings

- *Industrial Organization: Contemporary Theory and Empirical Applications,* 4th edition, Lynne Pepall, Dan Richards, and George Norman, Blackwell Publishing, 2008.
- *Modern Industrial Organization*, 4th Edition, Dennis Carlton and Jeffrey Perloff, Adison-Wesley, 2004.
- Hanley, N., H. Folmer (1998) *Game Theory and the Environment*. Edward Elgar Publishing.
- Dutta, P. and R.K. Sundaram (1993) "*The Tragedy of the Commons?*" Economic Theory, 3, pp. 413-426.

Assignments and Grading Scheme

Grading System

A , A- **Excellent**
B+ , B, B- **Very good**
C+, C, C- **Good**
D+ , D, D- **pass**
D-, F = **Failure**

Grading Policy

Students will be assessed based on the following:

Mid-term Exam	30%
Second exam	15%
Short Paper	5%
Final Exam	50%

The objective of the paper is to provide students with an opportunity to apply concepts from this course to a "real" market. Each student's presentation is expected to include the following three parts:
1. Clear description of the market to be discussed.
2. Complete analysis of recent strategic behavior within this market, across all relevant dimensions of firm behavior, including the choice of prices, capacity, products, advertising, R&D, entry, exit, etc.
3. Detailed analysis of one firm in this market (main focus of the presentation).

Details of the assignment and the submission deadline will be announced in class. Dates of exams will be announced in the class.

Course Policies

Classroom Protocol

We oblige ourselves to a high standard of professional behavior. Accordingly, lateness, holding private conversations and indeed any behavior that interrupts me or your colleagues will be considered improper. Using cell phones is forbidden in the class. Repeated violations of this standard may affect your participation grade or may cause withdrawal from course.

Academic Honesty

All the assignments and work submitted by the student should be his or her own. All actions of academic dishonesty including cheating, lifting or helping other students in such actions will be dealt with strictly according to the university regulations.

Course Schedule

Detailed lecture schedule			
Homework and Assignments	**Material:**	**Week:**	
TBA	Introduction • The field of industrial organization • Review of Firm, Market, production & cost concepts • Perfect competition compared to monopoly, the concept of economic efficiency	Week 1	
TBA	The industrial organization framework • Basic conditions • Structure • Conduct • Performance	Week 2	
TBA	Market Structure • Economies of Scale • Barriers to Entry and Exit and Contestability • Market Concentration • Product Differentiation	Week 3+4	
TBA	Market Performance • Definition of market performance • Dimensions of market performance	Week 5	

	• Measuring market performance		
TBA	Market Strategy in Oligopoly Market • The Cournot Oligopoly Model • The Bertrand Oligopoly Model • Edgworth Oligopoly Model • Stackelberg Oligopoly Model • Game Theory and Oligopoly • Cartels and Collusion • Kinked Demand Curve	Week 6+7+8	
TBA	Price Discrimination • Incentive and conditions for price discrimination • First-degree (perfect) price discrimination • Second degree price discrimination • Third degree price discrimination • Welfare effects of price discrimination	Week 9	
TBA	Mergers and Acquisitions • Reasons for mergers and acquisitions • Vertical mergers • Horizontal mergers • welfare effects of mergers • Nonprice Competition • Advertising and Information	Week 10	

	• Brandnames R&D, Patents, and Innovation Antitrust and regulation • Antitrust laws and their purposes • The objectives of regulation • Deregulation		
TBA	Industrial Environmental Economics issues Selected topics from: • The impacts of environmental regulations on industrial activity • Issues in industrial proliferation and environmental preservation, pollution control policies • Game Theory and the Environment ➢ Free-riding and Cooperation in Environmental games ➢ Incentives to participate in an international environmental agreements ➢ The Economics of Exhaustible Resources ➢ The Tragedy of the Commons ➢ The Problem of Externalities	Week 11+ 12	

TBA	Presentations	Week 13+14	
TBA	Final exam	Week 15	

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CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus
Managerial Economics
The University of Jordan, the School of Business, Department of Business Economics

Instructor Information

Instructor: Dr. Mohammed Alawen.
Office Location: The School of Business / Business Economics Department -Building #1 First Floor.
Telephone: 5355000 ext.
Office Hours:
E-mail:

Course Identification

Course Number:
Course Name: Managerial Economics
Course Location:
Class Times:
Prerequisites: 1607210 and 1607211
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

Economic theory is the fundamental determinant of firms' profitability and growth, and economic thinking should be an essential element in nearly every managerial decision. In this course, we will examine the principles of microeconomics, and show how they apply

to managerial decision-making. It explains how and why economic theory is used to analyze business problem. In this course we will start with part one; preliminaries (market equilibrium, optimal decisions and Basic estimation techniques), then explore part two demand analysis and its applications (elasticity and demand estimation and forecasting). In part three the production and cost analysis will be or main topic. In part four the student will learn hoe the firms maximize their profits in various market structures. In this particular part we will introduce a very important topic that can be related to take optimal decisions under risk and uncertainty with present of externalities. The climate change will be introduce as a hot topic from utilitarian perspective, the environment is taken into consideration only to the extent that it is useful to humans and then to the policy makers that may affect the standing of firms and global business. Economists are concerned with the environment in so far as it affects the wellbeing of human societies. Whereas environmentalists are concerned about natural systems, economists are primarily interested in natural resources. The economic model focuses on the efficiency of the use of natural resources in the production process. The ecological model places value on the long-term sustainability of natural systems. These dissimilar standards imply different goals for economic activity. We will try to explore these different situations and decision making within climate and einvernoment changes.

Course Learning Objectives

1. To equip the student with the principles he or she needs to make sense out of the conflicting and contradictory discussions of economic conditions and policies in newspapers and news magazines.
2. Enable the student to evaluate the performance of decision makers, and to predict the impact of their policy actions on families and business.
3. Understand and predict the economic forces shaping real-world business decisions.
4. Develop and strengthen overall analytical skills.
5. Develop critical thinking skills about markets and business decisions.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- Knowledge and Understanding:**

- Understand managerial behavior regarding maximizing the profit of the firm under different market structure.
- Understand managerial reaction concerning government policy and activities.
- Understand mathematical methods (Derivative, linear programming), and statistical techniques (regression – model) to help managers taking optimal decisions under risk and uncertinity.

LO **2- Analytical and Thinking Skills**:

Students should have the ability to:

- Present written and/or oral reports using critical thinking, economic data, and economic theory.
- Perform mathematics, and statistical knowledge and its application on economic- decision of the firms.
- Comprehend and communicate data presented graphically and/or mathematically.
- relate mathematical and statistical models to their assumptions and to the real world.

LO **3- Teaching and Learning Methods**:

Lectures, case studies, problem solving and tutorials.

- Lectures: 7 weeks, 21 hours
- Discussion forums: 7 weeks, 21 hours
- Tutorials: 2 weeks, 6 hours
- Applications (office hours): as requested

Course Resources

There will be 3 lectures per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical cases presented in the book.

Course Website(s)

-

Required Course Texts and Materials

- (Managerial Economics) 10th edition, 2011. *McGraw Hill* By: Thomas and Maurice.

- The Microeconomics of Urban Adaptation to Climate Change in Europe Matthew E. Kahn UCLA and NBER Institute of the Environment Department of Economics and Public Policy Mek1966.googlepages.com.

- Microeconomics and the Environment Global Development And Environment Institute Tufts University Medford, MA 02155 http://ase.tufts.edu/gdae A GDAE Teaching Module on Social and Environmental Issues in Economics by Jonathan M. Harris and Anne-Marie.

.Optional Course Texts and Materials

- **Nick Hanley, Jason Shogren, and Ben White, *Introduction to Environmental Economics*.**

Assignments and Grading Scheme

Grading System

A , A- **Excellent**
B+ , B, B- **Very good**
C+, C, C- **Good**
D+ , D, D- **pass**
D-, F = **Fail**

Grading Policy

Students will be assessed based on the following:

Mid-term Exam	30%
Second exam	15%
Participation	5%
Final Exam	50%

Assignments are individual assignments. Details of these assignments and the submission deadlines will be announced in class.

Course Policies

University Policies regarding class attendance, course pre-requisites, and academic honesty, grading, incompletes, and final exams will be observed as stated in the University of Jordan. You are responsible for all material discussed in class and assigned in the textbook. Missing class is strongly discouraged. Your professor is far less sympathetic to those who miss class regularly. If you miss class, you are responsible to get the notes from a classmate.

Any type of academic misconduct will result in (F). By Enrolling in this course, you agree with the University of Jordan Policy on Academic Misconduct.

Course Schedule

Detailed lecture schedule			
Homework and Assignments	Material:	Week:	
TBA	Ch (1): Managers, Profits and Markets(2-28)	Week 1	
TBA	Ch (2): Demand, Supply, & Market Equilibrium (36-64).	Week 2+3	
TBA	Ch (6): Elasticity and Demand (204-229)	Week 4	
TBA	Ch (3): Marginal Analysis for Optimal Decision Making(86-108) Ch (7): Demand Estimation & Forecasting(243-262)	Week 5+6+7	
TBA	Ch (8+9): Production and Cost in the Short (284-312),and long Runs (320-359),	Week 8+9	
	Ch (10): Production and Cost Estimation (371-377)	Week 10	

TBA	Ch (11): Managerial Decisions in Competitive Markets (398-441)	Week 11+12	
TBA	Ch (12): Managerial Decisions for Firms with Market Power. (453-478)	Week 13+14	
	Advanced topic in Managerial Economics: Microeconomics of climate change and risk management.	Week 15	
TBA	Final exam	Week 16	

(8)

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Environmental Economics

University of Jordan, Faculty of Business, Department of Business Economics

Instructor Information

Instructor: Khawlah A. Abdalla Spetan, Assistant Professor
Office Location: Faculty of Business / Business Economic Department -Building #1 first floor.
Telephone: 5355000 ext. 24163
Office Hours: TBD
E-mail: khawlah.spetan@ju.edu.jo, khawlahs2000@yahoo.com

Course Identification

Course Number:

Course Name: Environmental Economics
Course Location: TBD
Class Times: TBD
Prerequisites:
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This course tries to shed the light on a very important issue that started to affect all aspects of our life. Students will be introduced to the environmental issues from economics point of view. It offers an integrated understanding of environmental and natural resource economics. Important principles and concepts will be presented to provide students with clear understanding for contemporary environmental and natural resource issues and policy considerations. The course includes real world case studies to demonstrate the policy relevance and implications of key notions. Many areas of economics and impact of environmental policies will be covered. Basic concepts of environmental economics will be explored and examined, such as the economics of natural resource scarcity, climate change, environmental pollution, natural disasters, the economics of pollution, and the economics of sustainable development. The course provides an introduction to the subject of environmental economics without assuming any in-depth prior knowledge of economics. Part one explains the fundamental economic concepts. Part two uses these concepts in understanding and developing policy responses to some of the major environmental issues of our time. Examples will be drawn from all over the world and include such fundamental issues as climate change, water pollution, and loss of biodiversity.

Course Learning Objectives

The main objectives of this course are:1) increasing awareness towards the contemporary environmental issues caused by various human activities. 2) Identifying the issues of environmental pollution and global economic and development effects. 3) Cost Benefit Analysis of the various economic activities to determine their environmental impacts. 4) Understanding the economics of climate change and its impact on economic development issues.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- knowledge and understanding:**

- Understanding the linkages between economics and environmental issues.
- Understanding economic concepts in the context of environmental problems.
- Understanding the problems of climate change, water pollution, and loss of biodiversity within global overview of environmental issues.
- Understanding the various possible policy responses to major environmental issues.

LO **2- analytical and thinking skills**:

Students should have the ability to:

- Apply microeconomic theory to the study of environmental issues.
- Identify and critically evaluate alternative environmental policy instruments.
- Develop written and verbal skills in communicating an environmental economic perspective.

LO **3- Teaching and learning methods**:

- There will be 2 lectures per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical cases presented in the book.

- A number of problems (end-of-chapter problems) will be indicated in class, to be submitted by students. Students should attempt the homework and should prepare to discuss the assigned problems in the class.

Course Resources

Course Website(s)

- http://blackboard.ju.edu.jo

Required Course Texts and Materials

- **Handouts prepared by the instructor for the class.**
- Field, Barry C. and Martha K. Field, Environmental Economics, 5th Edition (San Francisco, CA: McGraw-Hill, 2009).

Optional Course Texts and Materials

• Keohane and Olmstead, *Markets and the Environment* (Island Press, 2007)
• Matthew Kahn, *Fundamentals of Environmental Economics: Solving Urban Pollution Problems.*

• Charles Kolstad, *Environmental Economics* (Oxford University Press, 1st edition 2000, or 2nd edition 2010)

• *The RFF Reader in Environmental and Resource Policy* (Wallace Oates Editor, 2nd edition 2006, RFF Press)

Assignments and Grading Scheme

Grading System

A , A- Excellent
B+ , B, B- Very good
C+, C, C- Good
D+ , D, D- pass
D-, F = Failure

Grading Policy

Students will be assessed based on the following:
Mid-term Exam 30%
Second exam 7%

Participation 5%
Short Paper 8%
Final Exam 50%
Details of assignments and the submission deadlines will be announced in class.

Course Policies

Late Assignments policy

All assignments are due at the beginning of class. Anything turned in after that will be considered late. Assignments will be accepted up to four days after the due date for half credit. Assignments will not be accepted at all after the four-day extension. Excessive absenteeism and late or missing work will result in lower grades. Contact with your teacher is strongly encouraged especially in the case of being absent. Additionally, please read the college's policy regarding absence and make-up work.

Classroom Protocol

We oblige ourselves to a high standard of professional behavior. Accordingly, lateness, holding private conversations and indeed any behavior that interrupts me or your colleagues will be considered improper. Using cell phones is forbidden in the class. Repeated violations of this standard may affect your participation grade or may cause withdrawal from course.

Course Schedule

Detailed lecture schedule			
Homework and	**Material:**	**Week:**	

Assignments			
TBA	**I. INTRODUCTION** **Economics and the Environment: Introduction** What is Environmental Economics? Ch. 1 and Ch. 2.	Week 1+2	
TBA	**ENVIRONMENTAL ECONOMIC ANALYSIS** **A. Environmental Analysis** Benefits and Costs, Supply and Demand, Ch. 3 Economic Efficiency: Markets, Ch. 4. Economics of Environmental Quality, Ch. 5	Week 3+4	
TBA	***B. Analytical Methods*** Framework of Analysis Ch. 6 Benefit-Cost Analysis: Benefits Ch. 7 Benefit-Cost Analysis: Costs Ch. 8 **MIDTERM EXAMINATION** Chapters (1 – 8)	Week 5 + 6	
TBA	ENVIRONMENTAL POLICY ANALYSIS **A. Criteria and Strategies** Criteria for Evaluating Environmental Policies, Ch. 9 Decentralized Policies: Liability Laws, Property Rights, Moral Suasion", Ch. 10	Week 7	
TBA	Command-and-Control Strategies: The Case of Standards, Ch. 11 Incentive-Based Strategies: Emission Charges and Subsidies, Ch. 12	Week 8 + 9	

TBA	Incentive-Based Strategies: Transferable Discharge Permits, Ch. 13	Week 10	
TBA	**B. Water Pollution** Water Pollution-Control Policy, Ch. 14	Week 11	
TBA	**C. Air Pollution** Air Pollution-Control Policy, Ch. 15	Week 12	
TBA	***D. Waste Pollution*** Government Policy on Toxics and Hazardous Substances, Ch. 16 State and Local Environmental Issues, Ch. 17	Week 13+14	
TBA	Final exam	Week 15	

Capstone Courses:

Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category
0300150	Community Service	---	Business economics	Business	University Requirement
1607311	Scientific Research in Economics	1607150	Business Economics	Business	Department Core

Community Service

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number: **1607311**

Scientific Research in Economics

University of Jordan, Faculty of Business, Department of Business Economics

…… Semester, ……

Instructor Information

Instructor: Dr.Dalal Alkadi

Office Location: Faculty of Business / Business Economics Department – Building #2, 2edfloor

Telephone: 5355000 ext. 24160
Office Hours:
E-mail: d.alkadi@ju.edu.jo
Website: www.ju.edu.jo

Course Identification

Course Number: **1607311**
Course Name: **Scientific Research in Economics**
Course Location:
Class Times:
Prerequisites: Principles of Statistics 1607150
Faculty Web Page: www.ju.edu.jo

Course Description/Overview

Covers these topics: the concept of scientific research and its definition, and kinds of scientific research, stages and objectives of scientific research, kinds and sources of data and data collection: Questionnaire, population and sample: kinds of sampling, the relation between statistics and scientific research, implementation and analyzing data using statistical methods with SPSS, finally writing reports.

Course Learning Objectives

Providing students with concepts and definition and the importance of scientific research, also providing students with skills in choosing the appropriate way of writing the Questionnaire, the statistical analysis and writing the final report.

Note: Students who are involved in CLIMASP sertificate can apply their research work on environmental issues.

Course Content Learning Outcomes

A. Knowledge and Understanding:

Students should have knowledge of:

- The main concepts of scientific research, and its importance.
- How to think wisely and scientifically.
- How to write questions in the Questionnaire.
- How to deal with the data.

B. Intellectual Analytical and Cognitive Skills:

Student is expected to:

- Write the questions in the Questionnaire correctly.
- Choosing and applying the appropriate statistical analysis.
- Writing the reports.

Course Resources

Hands-out prepared by the instructor for the class

Alkadi, D. (2008), "Methodology and techniques of Scientific Research and Data Analysis using SPSS".

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following:

Evaluation	Point %	Date
Midterm Exam	30	TBA
Second Exam & assignments	20	TBA
Final Exam	50	TBA
Total Points	**100**	

Course Policies

Learning Methodology

Duration: 16 weeks, 48 hours in total
Lectures: 42 hours, 3 per week (including two 1-hour term exams)
Although the lectures cover the vast majority of the course material, students must use the text book.
A number of problems (some could be chosen from the end of chapter problems) will be indicated in class, specifying their due time. A discussion of the assigned problems can be done through the preceding lectures. Also, applying all steps for different statistical methods using SPSS by students.

Classroom Protocol

Details of the assignments and the submission deadlines will be announced in class and/or posted on the course website. Students are advised to keep track of what is announced in class, it is their responsibility to do so, BEING ABSENT IS NOT AN EXCUSE FOR NOT KNOWING WHAT IS GOING ON.

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations.Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Contents

Content	Reference	Week	ILO/s
Introduction to scientific research methodology: - Definition of scientific research. - Kinds of scientific research. - The role of researchers in scientific research. - The role of government and		1	A&B

companies in scientific research.			
- Stages for research development. - Methods and types of scientific research.		2	A&B
- Stages in scientific research. - Objectives of scientific research.		3	A&B
Data and observations: - Kinds of data. - Sources of data. - Data collection.		4	A&B
Questionnaires.		5	A&B
Population and samples: kind of samples.		6	A&B
Statistics: - Relationship between the definition of statistics and scientific research methodology. - Relationship between statistical methods and scientific research methods. - Relationship between statistical theory and scientific research methodology.		7	A&B
Starting the program SPSS: - Entering the data and creating files. - Descriptive statistics and its applications.		8	A&B
- Statistical graphical methods and its applications. - Inferential statistics methods.		9	A&B

- Statistical method determination. - Statistical methods and its applications.		10	A&B
- Applying the steps to write Questionnaire. - Applying the steps to analyze data. - Starting writing reports.		11	A&B
- Methods and rules in writing Quotations. - Methods and rules in writing footnotes.		12	A&B
- Methods and rules in writing references. - Methods and rules in writing reports.		13	A&B
Recognizing the parts of the report which are preliminaries, the body of the research, and the appendix.		14	
Presenting the reports by students.		15	
Presenting the reports by students.		16	

CLIMASP Project

Mapping Courses from Economics & Public Policy Group
University of Jordan

Course Classification:

9. Core Courses (*for All Euro Pass Candidates*)
10. Elective Courses (*from Student Major or Group*)
11. Capstone Course
12. Additional Elective Courses

Core Courses:

*Two courses (6 Credit Hours), one from each other groups as in the following Table:

Group	Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category
Environment and Society	2305100	Introduction to Sociology	---	Sociology	Arts	University Elective
Economics and Public Policy	1607100	**International political economy	---	Business Economic	Business	University Elective
Science and Technology	0305100	Environment	---	Geology	Science	University Elective

Elective Courses:

Two programs from the Economics and Public Policy are involved, namely, Business Economics and Finance. Six courses (18 Credit Hours) may be taken by student from his major or other majors within the group.

Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category
1607330	International Trade Theory	1607110	Business	Business	Dept. Core

			Economics		
1607415	Economic development	1607111	Business Economics	Business	Dept. Core
1607431	International Finance	1607111	Business Economics	Business	Dept. Core
1607411	Contemporary Economic Issues	1607111	Business Economics	Business	Dept. Core.
1607225	Industrial Economics	1607110	Business Economics	Business	Dept. Core.
1607421	Managerial Economics	1607110	Business Economics	Business	Dept. Core.
New course	Environmental Economics	-	Business Economics	Business	Dept. Elective
1603450	Contemporary Issues in Finance	1603301	Finance	Business	Dept. Core
1603416	Financial Planning and Control	1603211	Finance	Business	Dept. Elective
1603315	**Entrepreneurship in Finance**	1603211	Finance	Business	Dept. Elective
1603444	**Risk Management**	1603443	Finance	Business	Dept. Elective

Capstone Course:

This course is based on design and/or practical training for senior students. Depending on the student major, the following courses fit as capstone course provided the training is conducted in the field of climate change and environmental sustainability. 6 Credit Hours.

Course Code	**Course Title**	**Prerequisite**	**Department**	**Faculty (College)**	**Course Category**
0300150	Community Service	---	Business economics	Business	University Requirement
1607311	Scientific Research in Economics	1607150	Business Economics	Business	Department Core

Additional Elective Courses

The following list contains courses than can be taken by student in case he/she wishes to diversify knowledge or unable to register in elective courses offered by his/her Department.

**A student cannot register in a university elective course offered by the Department of his/her major.
***The student will take 8 Courses (24 hrs). Student will take 6 courses from her/his field and the other 2 courses will be from the core courses. With the 6 hrs capstone course the total credit hours are 30 hrs.

Climate Change and Economics & Public Policy Core

Courses Syllabi

Core Course:

Group	Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category
Economics and Public Policy	1607100	**International political economy	---	Business Economic	Business	University Elective

(1)

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

International Political Economy

The University of Jordan, The School of Business, Department of Business Economics

Instructor Information

Instructor:

Office Location: The School of Business / Business Economics Department -Building #1 First Floor.

Telephone: 5355000 ext.

Office Hours:

E-mail:

Course Identification

Course Number: 1607100

Course Name: International Political Economy

Course Location:

Class Times:

Prerequisites: None

Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This course seeks to explore the interaction of economics and politics in global affairs- the struggle for power and wealth within the international system. The course begins by identification of the economic science and economic problem, the development of economic thought across different economic schools, concentrating on their different standpoints regarding the role of the government in the economic activity. The course aims also to study and analyze different economic systems and their characteristics.

Special emphasis will be placed on the international dimension of political economy, focusing on the interconnected political and economic structures of the world and considering the undergoing enormous change, in order to understand the key elements of this change and see which paths lead to the most promising future. While the questions of international monetary, financial and trading systems are of particular importance, other topics of interest include: the flow across borders of goods, capital, foreign investment and migration ;role of multinational corporations, regional economic organizations and their role in economic integration, environmentally sustainable development, climate change, and prospects for welfare as an economic, political, technological and socio-cultural ongoing process.

Course Learning Objectives

The main goals of this course are to:

- Raise awareness that neither international politics nor international economics can be understood in isolation.
- Focus attention on the four types of cross-border flows (goods, capital, .investment and migration),and the polices- set forth by domestic and international institutions and arrangements- that regulate these flows.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- Knowledge and Understanding:**

A1) Understand the major theoretical perspectives on international political economy, the assumptions concerning appropriate unit analysis and nature of interactions between units on which they are based, and their implications for policy.
A2)) Learn how economic organizations on the national and international levels compete and integrate with each other.
A3) Understand the importance of the ecological constraints on economic growth and development.
A4) Try to investigate the extent of the Jordanian economy to influence and be affected by the world economy.

LO **2- Analytical and Thinking Skills**:

Students should have the ability to:

B1) Indentify and evaluate institutional, political, cultural and economic constraints on the speed and effectiveness of political and/or economic positive change in developing countries.
B2) Collect and analyze relevant data associated with international political economy.

LO **3- Teaching and Learning Methods**:

- Lectures, dialogue and discussion.
- Research.
- Cooperative learning.
- Brain – storming.

Course Resources

Course Website(s)

- http://blackboard.ju.edu.jo

Required Course Texts and Materials

- **Balaam, David N. , and Bradford Dillman.. " *Introduction to International Political Economy* "5th ed. Longman 2010.**
- **Oatley, Thomas.2011. " *International Political Economy*", 5th Edition. New york, Longman.**

- Joseph E. Stiglitz " *Globalization and its Discontents,* " New York : Norton, 2002.

Optional Course Texts and Materials

-

Assignments and Grading Scheme

Grading System

A , A- **Excellent**
B+ , B, B- **Very good**
C+, C, C- **Good**
D+ , D, D- **pass**
D-, F = **Fail**

Grading Policy

Grades can be based on the following :

Attendence	**5 %**
Mid-term exam	**30%**
Final exam	**50%**
Participation in the seminars	**10%**
Short Paper	**5%**
Total	**100%**

Course Policies

University Policies regarding class attendance, course pre-requisites, and academic Honesty, dropout, grading, incompletes, and final exams will be observed as stated in the University of Jordan. You are responsible for all material discussed in class and assigned in the textbook. Missing class is strongly discouraged. Your professor is far less sympathetic to those who miss class regularly. If you miss class, you are responsible to get the notes from a classmate.

Any type of academic misconduct will result in (F). By Enrolling in this course, you agree with the University of Jordan Policy on Academic Misconduct.

Course Schedule

Week	Material
1	Introduction and basic concepts
2	Definition of economic science and economic problem
3+4	Development and analysis of different schools of economic thought
5+6	Economic systems + first exam
7	Sustainable global development
8	Financial systems and fiscal policy
9+10	International finance, third world debt and the macroeconomic stabilization controversy
11	Trade policy, regional and world trade organizations
12	Direct foreign investment and foreign aid
13	The global environmental threat
14	Climate protection
15	Final Exam

Elective Courses syllabi:
(2)

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

International Trade Theory

The University of Jordan, The School of Business, Department of Business Economics

Instructor Information

Instructor: Buthaina M.A.Muhtaseb, Associate Professor

Office Location: The School of Business / Business Economics Department -Building #1 first floor.

Telephone: 5355000 ext. 24839

Office Hours:

E-mail: b.muhtaseb@ju.edu.jo, b.muhtaseb@yahoo.com

Course Identification

Course Number: 1607330

Course Name: International Trade Theory

Course Location:

Class Times:

Prerequisites: Principles of Microeconomics (1607110)

Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This courses analyzes the causes and consequences of international trade. Various theories of international trade and its extensions will be explained and evaluated in both perfect and imperfect competition, with some reference to the empirical evidence. Some of the essential questions that will be addressed: Why do countries trade? Are countries better off because they trade? Are both trading partners better off? Who gains and who loses within a country? What is the relation between trade and growth? What if markets don't work perfectly? How does that affect our assessments?

Course Learning Objectives

1-To introduce students to international economic concepts and ideas.
2- To develop the ability to reason accurately and objectively about international economic issues.
3- To aid students in judging what kinds of decisions, policies, and behavior are sensible from an international perspective.
4- Enable students to understand international trade flows incentives, directions, and effects.
5- To highlight the relation between international trade and economic growth and welfare. (Welfare should not be measured by the rise in consumption only. Other aspects as good social relations, and clean nature should be considered).

Course Content Learning Outcomes (ILOS)

Successful completion of this course should lead to the following learning outcomes:

LO1- Knowledge and Understanding:

A1) Understand basic concepts of foreign trade.
A2) Demonstrate knowledge and understanding of different international trade theories
A3) Understand foreign trade structure of Jordan
A4) Describe and understand the links between foreign trade and growth
A5) understand international trade under different market structures (competitive versus noncompetitive markets)

LO2- Intellectual Skills:

B1) Prepare and present reports using critical thinking, trade data, and international trade theories
B2) Explain the mechanisms of international flows of commodities and factors
B3) Relate local economic developments to international economic developments
B4) Use computers and internet to access trade flows data and sources.

LO3- Subject Specific Skills:

C1) Apply international trade theories to relate domestic equilibrium prices to foreign prices

C2) Employ trade models to analyze the effects of trade on production, prices and terms of trade, and economic growth
C3) Use micro and macro-economic tools to assess net gains from international trade
C4) Develop the skills required to relate domestic economy equilibrium/disequilibrium to domestic and foreign influences
C5) Analyze international commodities flows directions and causes, and explain migration incentives and disincentives.

LO4- Transferable Skills:

D1) Gather data for basic economic research from various sources, including the computer and other forms of electronic media, such as the Internet.
D2) Acquire English language command of international trade concepts and definitions.
D3) Demonstrate knowledge and skills necessary for integrating information technology into global trade**.**

Teaching and Learning Methods

Duration: 16 weeks, 48 hours in total
Lectures: 28 hours, 3 per week (including two 1-hour midterm exams)
Case study: 8 hours
Tutorials: 6 hours
Applications: 6 hours
Laboratory: -

Teaching Methods					
Methods	**Lectures**	**Case study**	**Tutorials**	**Laboratory**	**Applications**
Objectives learning outcomes	A1 A2 A3 A4 A5 B2 B3 B4 C1 C2 C3 C4 C5 D2	A3 A5 B1 B4 C4 D1 D3	A3 A4 A5 B1 B4 C2 C5 D1	-	A2 A4 A5 B3 C1 C2 C3 C5 D1 D3
Assessments	Exams + Assignments	Exams + Assignments	Project + Assignments	Project + Assignments	Exams + Assignments

To be assigned later in class

Assignments and Grading Scheme

Mid-term Exam	**30%**
Short Paper (1)	**7%**
Participation/Attendance	**5%**
Quiz	**8%**
Final Exam	**50%**
Total	**100%**

Course Policies

Academic Honesty

Course Requirements

Course Website(s)

- http://blackboard.ju.edu.jo

Required Course Texts and Materials

- Awad Talib***, "International Trade: Theory and Policy" ,*** The University of Jordan, Amman, 1995.
- Krugman R. Paul and Obstfeld Maurice, "***International Economics: Theory and Policy***", seventh Edition. Boston: Addison-Wesley, 2008

Optional Course Texts and Materials

All the assignments and work submitted by the student should be his or her own. All actions of academic dishonesty including cheating, plagiarism or helping other students in such actions will be dealt with strictly according to the university regulations.

Course Schedule

Week	Materials
1	Unit 1: Introduction to International Economics -Causes of trade. -Patterns of trade. -Gains from trade. * Fair Trade. * Drawbacks of Free Trade
2+3+4	Unit 2: Labor Productivity and Comparative Advantage - Dynamic comparative advantage and ethics. + **Exam 1**
5+6+7	Unit 3: Resources and Trade: The Heckscher-Ohlin Model - The role of resources in explaining foreign trade. - The concept of sustainability and its relation to natural resources. - Each generation should leave the environment not worse off, and not damaged by depletion of resources

	or pollution of land, water and atmosphere.
8+9	Unit 4: The Standard Trade Model - Income Distribution (Who gain and who loses from free trade within a country? - Trade Development and Growth * Interaction between the three dimensions of development : economic, social and environmental. * Growth and sustainability (Is the traditional macroeconomic goal of economic growth compatible with the long term goal of sustainability?) - Trade and the environment * Analysis combining trade theory with the theory of externalities to show how the basic principle of gains from trade must be modified in a real world with many environmental complications. * The issues of sustainable trade and "greening" global environment institutions encourage the student to place the theoretical issues in the context of real – world policy.
10+11	Unit 5: Modern Theories of International Trade: Economies of Scale, Imperfect Competition, and International Trade. - The Gravity Modal (The role of language, history and culture in addition to other factors in enhancing exports and imports.

	+ **Exam 2**
12	Unit 6: International Factor Movements -Immigration -Multinational Enterprise - Linkages between international Labor and capital mobility (Investor rights, Labor standards).
13+14	Unit 7 : Trade Polices and Trade Agreements - Tariffs and Quotas. - Some nontariff barriers are unfair(Indirect way of developed countries to reduce imports from developing countries) - Trade liberalization and the WTO, IMF, WB (suspicious roles?)
15	Unit 8 : Application on Foreign Trade to Jordan - Real cases (trade and the environment in Jordan). - Computation of "terms of trade" of Jordan, their change over time and the impact of this change on welfare" + **Exam 3 (Final): Cover all units with higher weights given to units not covered in the previous exams.**

(3)

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Economic Development

University of Jordan, Faculty of Business, Department of Business Economics

Instructor Information

Instructor:

Office Location: Faculty of Business / Business Economic Department -Building #1 first floor.

Telephone: 5355000 ext. 24163

Office Hours: Day(s) time Sun., Tues. & Thur. 12:00-1:00

Mon. & Wed. 11:00-12:00

E-mail: khawlah.spetan@ju.edu.jo, khawlahs2000@yahoo.com

Course Identification

Course Number: 1607415
Course Name: Economic Development
Course Location: University Campus
Class Times: Mon, Wed 12:30-2:00
Prerequisites: 1607111 Principle of Macroeconomics
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This course introduces the theory of growth and economic development, providing a qualitative and analytical perspective of economic transformation of developing countries for undergraduate students. It tries to provide an explanation for the exceptional progress that has been made in many parts of the developing world, but fully deals with the massive problems and challenges that remain to be addressed in the years ahead. It explains measurements of and obstacles to growth and development and tries to explore the difficulties that confront the sustainable development policies. The module focuses on the theory of growth and development and its interaction with trade, population, poverty, and income distribution. The pace and extent of economic development continues its prompt, imbalanced, and sometimes unexpected evolution. The course has been divided into two parts, the first part is about concepts and principles and includes three sections; an introduction of economic development from global perspective, comparative economic development and analysis of convergence, and Classic theories of economic growth and development. The second part is about problems and polices that faces the development in less developing countries; poverty inequality and development, Population Growth and Economic Development and finally the environment and development, basic issues in Global warming and climate change and its fallout on economic development.

Course Learning Objectives

- The main objectives of this course are: 1) to offer an analytical approach to the concepts related to growth and economic development in the context of sustainable development. 2) to equip students with appropriate tools and techniques that help them to analyze situations related to growth and development such as poverty and inequalities …. 3) draw the attention to some issues in environmental pollution and global economic and its relation with economic development. 4) realize the climate change consequences on sustainable economic development. 5) to provide students with the resources to draw independent conclusions as they confront development problems.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- knowledge and understanding:**

- Understanding different theories related to economic development
- Comparing developing and developed countries experiences.
- Understanding the aims of development and how to reach them through the different sectors of the economy.
- Classifying the stages of economic development.
- Identifying the problems related to sustainability and the impact of climate change in economic development over time.

LO **2- analytical and thinking skills**:

Students should have the ability to:

- Comparing theories and finding the best suitable one which can be applied in Jordan economy.
- Developing some of the core models in poverty and inequality measurement and analysis.
- Highlighting and developing some of the core models in microeconomics of fertility and relationships between population growth and economic growth.
- Discuss the relationship between the environmental economics models and the sustainable economic development.

LO **3- Teaching and learning methods**:

- There will be 2 lectures per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical and the qualitative cases presented in the book.

- A number of problems (end-of-chapter problems) will be indicated in class, to be submitted by students. Students should do the homework and should come to class prepared to discuss the assigned problems.

Course Resources

Course Website(s):

- http://www.global-economic-symposium.org/knowledgebase/the-global-environment/climate-change-and-economic-development.

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class.
- Todaro, M. and S. Smith, Economic Development, 11th edition,2012
- **Robert E. LUCAS, Jr., On the Mechanics of Economics Development,** University of Chicago, Chicago, 1L 60637, USA,1988.
- Human Development Report 2011. Sustainability and Equity: A better future for All, UNDP.
- Anthony D. Owen & Nick Hanley, The Economics of climate Change, Routledge,2004.
- **http://www.unep.org/pdf/ourplanet/op_english_17v2.pdf**
- **https://environment.yale.edu/files/biblio/YaleFES-00000397.pdf**
- فايز ابراهيم الحبيب، نظريات التنمية والنمو الاقتصادي
- سالم النجفي، مقدمة في اقتصاد التنمية
- عبد الوهاب الأمين، التنمية الاقتصادية: السيسات والمشكلات

- تقرير حالة الفقر في الأردن، إستناد اً لبيانات مسح نفقات ودخل الأسرة،2010، دائرة الإحصاءات العامة، الأردن.

Assignments and Grading Scheme

Grading System

A , A- Excellent
B+ , B, B- Very good
C+, C, C- Good
D+ , D, D- pass
D-, F = Failure

Grading Policy

Students will be assessed based on the following:

Mid-term Exam	30%
Second exam	7%
Participation	5%
Short Paper	8%
Final Exam	50%

Assignments are individual assignments. Details of these assignments and the submission deadlines will be announced in class.

Course Policies

Late Assignments policy

All assignments are due at the beginning of class. Anything turned in after that will be considered late. Assignments will be accepted up to four days after the due date for half credit. Assignments will not be accepted after the four-days extension. Excessive absenteeism and late or

missing work will effect in lowered grades. Contact with your teacher is strongly encouraged especially when you have been absent. In addition, please see handout on the college's policy on absence and make-up work.

Classroom Protocol

We oblige ourselves to a high standard of professional behavior. Accordingly, lateness, holding private conversations and indeed any behavior that interrupts me or your colleagues will be considered improper. Using cell phones is forbidden in the class. Repeated violations of this standard may affect your participation grade or may cause withdrawal from course.

Course Schedule

Detailed lecture schedule			
	Week:	**Material:**	**Homework and Assignments**
	Week 1+2	Ch 1: Introduction	TBA
	Week 3+4	Ch 2:Comparative economic development First Exam	TBA
	Week 5+6	Ch 3:Classic theories of economic growth and development	TBA
	Week 7+8	Ch 5: Poverty, inequality and development Second Exam	TBA
	Week 9+10	Ch 6: Population growth and economic development	TBA
	Week 11+12	Ch 10: Environmental and Economic Development	TBA

	Week 13+14	Climate Change and its consequences on Economic Development	TBA
	Week 15	Final exam	TBA

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CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

1607421: International Finance

University of Jordan, Faculty of Business, Department of Business Economics

Spring, 2014

Instructor Information

Instructor: Khawlah A. Abdalla Spetan, Assistant Professor

Office Location: Faculty of Business / Business Economic Department -Building # first floor

Telephone: 5355000 ext. 24163

Office Hours: Day(s) time: Sun., Tues. & Thur. 10:00-11:00
Mon. & Wed. 1:45 -2:15

E-mail: khawlah.spetan@ju.edu.jo, khawlahs2000@yahoo.com

Course Identification

Course Number: 1607421

Course Name: International Finance

Course Location:

Class Times: Monday & Wednesday 11:00 – 12:15

Prerequisites: 1607111, Macroeconomics principles

Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This is a course in international monetary economics, which includes the connection between the exchange rates and international macroeconomic policies. The subject of international finance draws its importance from the consequences of worldwide economic policies on a country economy's main outcomes (Employment, National Saving, Trade Balance and Price levels and Money). The course divided into three parts: The first part of the course will present several theories of exchange rate, and the second part will help you gather these theories into an overall analytical framework. The third part will challenge you to employ this analytical framework to real-world applications, and try to link the global financial crisis and the climate change issue. Provide students an up-to-date and understandable analytical framework for revealing current events. Help them grasp and retain the underlying logic of international finance through six to seven sections; first section we will talk about the national income accounts an d balance of payments, second section will be about the asset approach of exchange market and foreign exchange market, third section is about money market and inflation and exchange rate dynamics. In the fourth section the student will try to explore the causes of the fluctuations in exchange rate in long and short runs periods. The fixed exchange rates system will be introduced in section five. And finally in sixth section we will discuss the international macroeconomic policy and try to connect the causes of financial crisis with the most contemporary issue the climate change and their interaction.

Course Learning Objectives

The objectives of this course are: 1) introduce the main exchange rates theories and its determinants and understand the role of exchange rates in international trade . 2) students will understand the movements in macroeconomic variables such as the trade balance, the exchange rate, money, interest rate, national output, and inflation, in short and long runs. 3) Understanding how the interactions of national economies influence the worldwide pattern of macroeconomic activity.4) explore the various international currency arrangements and how did countries try to attain internal and external balance. 5) explain the linkages between the financial crisis and the environmental economics specifically the climate change issue.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- knowledge and understanding:**

- Understand the basic theory of international macroeconomics and finance.
- Understand the determination of the exchange rates in foreign exchange markets.
- Understand why exchange rates can change dramatically over periods of several years.
- Understand the complicated factors that cause output, exchange rates, and inflation to change in the short-run.
- Understand the role of the central bank foreign exchange intervention in the determination of the exchange rates under fixed and managed floating system.
- Understand how the international monetary system influenced the macroeconomic policy making during certain periods.
- Understand the performance and policy problems of the global capital market.
- Understand the international finance of climate change from different perspectives.

LO **2- analytical and thinking skills**:

Students should have the ability to:

- Analyze, in an unbiased way, a wide array of important international policy issues.
- Analyze the exchange rates movements in the modern theory of floating exchange rates.
- Relate mathematical and identification models to their assumptions and to the real world.
- Predict in somehow financial crises.
- Link the financial crisis with global warming proplem (climate change issue)

LO **3- Teaching and learning methods**:

- There will be 2 lectures per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical cases presented in the book.

- A number of problems (end-of-chapter problems) will be indicated in class, to be submitted by students. Students should attempt the homework and should come to class prepared to discuss the assigned problems.

- Case studies reinforcing material covered, illustrating its applicability in the real world.

Course Resources

Course Website(s)

- http://blackboard.ju.edu.jo
- http://www.facebook.com/groups/106367372820252
- www.cbj.gov.jo
-

Required Course Texts and Materials

- (International Economics: Theory and Policy) 8th edition, 2009. Addison Wesley, by Paul Krugman and Maurice Obstfeld.
- Climate Change and the Global Financial Crisis, Robin Leichenko, Karen O'Brien and William Solecki**.**

Climate change and the financial crisis: A case of double Exposure**,** Robin M. Leichenko, Karen L. O'Brien, and William D. Solecki**,** *Annals of the Association of American Geographers*, 100(4) 2010, pp. 963–972 C, Published by Taylor & Francis, LLC.

- The economics of climate change, Anothony D. Owen, Nick Hanley**,**2004.
- International Climate Change Financing: The Green Climate Fund (GCF). Richard K. Lattanzio Analyst in Environmental Policy, Congressional Research Service April 16, 2013.
- The Effect of the Global Financial Crisis on Climate Change, Imogen Reed. Posted on April 13, 2012 .
- Climate Change May Trigger the Next Financial Crisis.

- What is the impact of the economic crisis on the climate change debate? Question submitted by Soumaya Maghnouj, from Sciences-Po, March 22, 2013 Answered by: Daniel P. Ahn, Adjunct Fellow for Energy

- التجارة الدولية نظريات و سياسات، الدكتور طالب عوض، 1995

Optional Course Texts and Materials

- Peterson Institution for International Economics (http://www.piie.com).

Assignments and Grading Scheme

Grading System

A , A- Excellent
B+ , B, B- Very good
C+, C, C- Good
D+ , D, D- pass
D-, F = Failure

Grading Policy

Students will be assessed based on the following:

Mid-term Exam	30%
Second exam	7%
Participation	5%
Short Paper	8%
Final Exam	50%

Assignments are individual assignments. Details of these assignments and the submission deadlines will be announced in class.

Course Policies

Late Assignments policy

All assignments are due at the beginning of class. Anything turned in after that will be considered late. Assignments will be accepted up to four days after the due date for half credit. Assignments will not be accepted after the four-days extension. Excessive absenteeism and late or missing work will effect in lowered grades. Contact with your teacher is strongly encouraged especially when you have been absent. In addition, please see handout on the college's policy on absence and make-up work.

Classroom Protocol

We oblige ourselves to a high standard of professional behavior. Accordingly, lateness, holding private conversations and indeed any behavior that interrupts me or your colleagues will be considered improper. Using cell phones is forbidden in the class. Repeated violations of this standard may affect your participation grade or may cause withdrawal from course.

Course Schedule

Detailed lecture schedule			
	Week:	**Material:**	**Homework and Assignments**
	Week 1+2	-Introduction Ch (12): National Income Accounting and the Balance of Payments.	TBA
	Week 3+4	Ch (13): Exchange Rates and the Foreign Exchange Market.	TBA
	Week 5	Ch (14): Money, Interest Rates, and	TBA

		Exchange Rates. First Exam	
	Week 6	Ch (15): Price Levels and the Exchange Rate in the Long-R.	TBA
	Week 7	Ch (16): Output and the Exchange rate in Short-R.	TBA
	Week 8+9	Ch (17): Fixed Exchange Rates and Foreign Exchange Intervention +second exam	TBA
	Week 10	Ch (18): The International Monetary System, 1870-1973.	TBA
	Week 11+12	Ch (21): introduction to climate change problem	TBA
	Week 13+14	Ch (22): Developing Countries: Growth, Crisis, global warming and climate change.	TBA
	Week 15	Final exam	TBA

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Contemporary Economic Issues

The University of Jordan, the School of Business, Department of Business Economics

Instructor Information

Instructor:
Office Location: The School of Business / Business Economics Department -Building #1 First Floor.
Telephone: 5355000 ext.
Office Hours:
E-mail:

Course Identification

Course Number: 1607411
Course Name: Contemporary Economic Issues
Course Location:
Class Times:
Prerequisites: 1607210 and 1607211
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This course is primarily concerned with contemporary economic issues at the domestic, regional and international levels. Specific topics are chosen from current and recent policy debates.

Course Learning Objectives

The main objective of this course is to augment the students' comprehension of the various contemporary economic issues which arise in the world, and analyze their negative and positive effects on the Jordanian community.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- Knowledge and Understanding:**

A1) understand the new and important contemporary economic issues.
A2) understand the problems and reasons that are associated with economic issues.
A3) realize the importance of the issues of environmental economics and climate change.

LO **2- Analytical and Thinking Skills**:

Students should have the ability to:

B1) collect and analyze relevant data associated with contemporary economic issues.
B2) perform basic analytical techniques and operations in the context of economic issues.
B3) comprehend and communicate positively and effectively data presented in dialogue forums.
B4) develop analytical skills through class presentations, discussions and writing research papers.
B5) apply microeconomic and macroeconomic analysis to evaluate a current public policy.

LO **3- Teaching and Learning Methods**:

Lectures, case studies, problem solving and tutorials.

- Lectures: 7 weeks, 21 hours
- Discussion forums: 7 weeks, 21 hours
- Tutorials: 2 weeks, 6 hours
- Applications (office hours): as requested

Course Resources

Students should use course description as general guidelines. Book lists and syllabi are subject to change.

Because the course focuses on current economic issues, students will be asked to supplement the chosen textbooks with readings from newspapers, magazines, and the internet

Course Website(s)

- http://blackboard.ju.edu.jo

Required Course Texts and Materials

Although the complete list of references and textbooks materials will be assigned during the course, these books are required:

- **Bonello, Frank J. And Isobel Lobo, *Taking Sides : Clashing Views on Economic Issues.* 15th Edition. McGraw Hill, 2012.**
- **Robart, C.Guell, *Economics Today*, sixth edition, McGraw Hill, 2010.**
- **Anothony D. Owen, Nick Hanley, *The Economics of Climate Change*,2004.**

Optional Course Texts and Materials

- **Nick Hanley, Jason Shogren, and Ben White, *Introduction to Environmental Economics***

Assignments and Grading Scheme

Grading System

A , A- **Excellent**
B+ , B, B- **Very good**
C+, C, C- **Good**
D+ , D, D- **pass**
D-, F = **Fail**

Grading Policy

Students will be assessed based on the following:

Mid-term Exam	30%
Second exam	7%
Participation	5%
Short Paper	8%
Final Exam	50%

Assignments are individual assignments. Details of these assignments and the submission deadlines will be announced in class.

Course Policies

University Policies regarding class attendance, course pre-requisites, and academic honesty, grading, incompletes, and final exams will be observed as stated in the University of Jordan. You are responsible for all material discussed in class and assigned in the textbook. Missing class is strongly discouraged. Your professor is far less sympathetic to those who miss class regularly. If you miss class, you are responsible to get the notes from a classmate.

Any type of academic misconduct will result in (F). By Enrolling in this course, you agree with the University of Jordan Policy on Academic Misconduct.

Course Schedule

The contents of this course will be determined according to the economic issues that arise during a particular time period.

Below is a proposed list of some topics. We do not want to make this a formal Schedule because we want to be able to introduce topics as they arise. This may mean introducing new topics or shifting the order of the topics we have already chosen.

Detailed lecture schedule			
	Week:	**Material:**	**Homework and Assignments**
	Week 1+2	-Introduction World recession / recovery	TBA
	Week 3+4	Globalization.	TBA
	Week 5	Poverty and sustainable development First Exam	TBA
	Week 6	Assessment of the Greater Arab Free Trade Area.	TBA

	Week 7	Environmental justice: income, race and health	TBA
	Week 8+9	The transition to renewable energy. +second exam	TBA
	Week 10	The economics of climate change	TBA
	Week 11+12	Developing countries and climate change.	TBA
	Week 13+14	Climate change Cost –benefit analysis	TBA
	Week 15	Final exam	TBA

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CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Industrial Economics

University of Jordan, Faculty of Business, Department of Business Economics

Instructor Information

Instructor:	Nahil I. Saqfalhait, Associate Professor
Office Location:	Faculty of Business / Business Economics Department -Building #2, second floor.
Telephone:	5355000 ext. 24172
Office Hours:	TBD
E-mail:	nahil.saqfalhait@ju.edu.jo

Course Identification

Course Number:	1607225
Course Name:	Industrial Economics
Course Location:	TBD
Class Times:	TBD
Prerequisites:	Principles of Microeconomics (1607110)

Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

Industrial organization is essentially a branch of applied microeconomics which seeks to understand the causes and effects of various market structures on pricing and product choices. The course focuses on the theory of the firm and the industry in imperfectly competitive markets with an emphasis upon oligopoly theory, but it also addresses empirical applications of the theory. The course explains how firms compete with each other; it models firms' strategies on imperfect markets and derives the impact of firms' behavior on welfare and market structures.
We will analyze market structure, firm conduct, and economic performance of industries. Of special interest is firms' strategic behavior in price and non-price competition. The types of behavior, or conduct, include oligopoly pricing and production, strategic entry deterrence, location strategies, product differentiation, advertising, vertical and horizontal integration, and research and development. The effects of firms' conduct upon economic welfare and feedback effects upon market structure are examined. Moreover, we will analyze the acquisition and use of market power by firms, antitrust law or/and the role of government competition policy.
We will also look at how institutions and industry can shape improvements in environmental quality and support efficient allocations of resources.

Course Learning Objectives

This module aims at providing students with major topics in the field of Industrial Organization. The knowledge that the student will derive from the course is useful for further study of firms and markets as well as the study of effects of regulatory and legal systems (such as antitrust law or competitive policies) upon firms. The knowledge is also useful in further study of the internal operation of firms. Topics covered in this course are useful not only for academic consideration, but also in private enterprises, including financial and legal institutions; in government regulatory agencies; and in international trade.

Course Content Learning Outcomes

Upon the completion of this module, students should be able to achieve the following:

LO **1- knowledge and understanding:**

Students should have knowledge of:

- The definition, measurement and analysis of various key elements of industrial organization.
- Why markets are organized as they are and behave in the way they do.
- Models of competitive, oligopolistic, and monopoly markets.
- The basic dimensions of industries structure, conduct, and performance.
- Price and non-price competition among firms.
- The acquisition and use of market power by firms.
- Role of government competition policy and regulation.
- Industrial environmental economics issues.

LO **2- analytical and thinking skills**:

Students should have the ability to:

- Analyze and evaluate models of competitive, oligopolistic, and monopoly markets.
- Analyze and evaluate how firms' structure and conduct affect economic welfare and how these results feed back to effect structure and conduct.
- Explain the various types of industry structures, conduct, and performance; business strategies; and policy alternatives.
- Understand how firms make their decisions based on strategic thinking.
- Discuss theoretical and empirical issues relating to the interactions among firms in a market economy.
- Apply basic concepts of economic analysis of market structures and understand current debates concerning plausible reform of competition policy.
- Evaluate antitrust policies and other government regulations of industry.
- *Analyze environmental issues through a deeper understanding of firms' economic behavior and incentives.*

LO **3- Teaching and learning methods**:

- There will be 3 hours per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical cases presented in the book.

- A number of problems will be indicated in class, to be submitted by students. Students should attempt the homework and should come to class prepared to discuss the assigned problems.

Course Resources

Course Website

- http://blackboard.ju.edu.jo

Main textbook(s) and additional readings

- *Industrial Organization: Contemporary Theory and Empirical Applications,* 4th edition, Lynne Pepall, Dan Richards, and George Norman, Blackwell Publishing, 2008.

- *Modern Industrial Organization*, 4th Edition, Dennis Carlton and Jeffrey Perloff, Adison-Wesley, 2004.

- Hanley, N., H. Folmer (1998) *Game Theory and the Environment*. Edward Elgar Publishing.

- Dutta, P. and R.K. Sundaram (1993) "*The Tragedy of the Commons?*" Economic Theory, 3, pp. 413-426.

Assignments and Grading Scheme

Grading System

A , A- **Excellent**
B+ , B, B- **Very good**
C+, C, C- **Good**
D+ , D, D- **pass**
D-, F = **Failure**

Grading Policy

Students will be assessed based on the following:

Mid-term Exam	30%
Second exam	15%
Short Paper	5%
Final Exam	50%

The objective of the paper is to provide students with an opportunity to apply concepts from this course to a "real" market. Each student's presentation is expected to include the following three parts:
1. Clear description of the market to be discussed.
2. Complete analysis of recent strategic behavior within this market, across all relevant dimensions of firm behavior, including the choice of prices, capacity, products, advertising, R&D, entry, exit, etc.
3. Detailed analysis of one firm in this market (main focus of the presentation).

Details of the assignment and the submission deadline will be announced in class. Dates of exams will be announced in the class.

Course Policies

Classroom Protocol

We oblige ourselves to a high standard of professional behavior. Accordingly, lateness, holding private conversations and indeed any behavior that interrupts me or your colleagues will be considered improper. Using cell phones is forbidden in the class. Repeated violations of this standard may affect your participation grade or may cause withdrawal from course.

Academic Honesty

All the assignments and work submitted by the student should be his or her own. All actions of academic dishonesty including cheating, lifting or helping other students in such actions will be dealt with strictly according to the university regulations.

Course Schedule

Detailed lecture schedule			
	Week:	**Material:**	**Homework and Assignments**
	Week 1	Introduction • The field of industrial organization • Review of Firm, Market, production & cost concepts • Perfect competition compared to monopoly, the concept of economic	TBA

		efficiency	
	Week 2	The industrial organization framework • Basic conditions • Structure • Conduct • Performance	TBA
	Week 3+4	Market Structure • Economies of Scale • Barriers to Entry and Exit and Contestability • Market Concentration • Product Differentiation	TBA
	Week 5	Market Performance • Definition of market performance • Dimensions of market performance • Measuring market performance	TBA
	Week 6+7+8	Market Strategy in Oligopoly Market • The Cournot Oligopoly Model • The Bertrand Oligopoly Model • Edgworth Oligopoly Model • Stackelberg Oligopoly Model • Game Theory and Oligopoly • Cartels and Collusion • Kinked Demand Curve	TBA

	Week 9	Price Discrimination • Incentive and conditions for price discrimination • First-degree (perfect) price discrimination • Second degree price discrimination • Third degree price discrimination • Welfare effects of price discrimination	TBA
	Week 10	Mergers and Acquisitions • Reasons for mergers and acquisitions • Vertical mergers • Horizontal mergers • welfare effects of mergers • Nonprice Competition • Advertising and Information • Brandnames R&D, Patents, and Innovation Antitrust and regulation • Antitrust laws and their purposes • The objectives of regulation • Deregulation	TBA
	Week 11+ 12	Industrial Environmental Economics issues Selected topics from:	TBA

		• The impacts of environmental regulations on industrial activity • Issues in industrial proliferation and environmental preservation, pollution control policies • Game Theory and the Environment ➢ Free-riding and Cooperation in Environmental games ➢ Incentives to participate in an international environmental agreements ➢ The Economics of Exhaustible Resources ➢ The Tragedy of the Commons ➢ The Problem of Externalities	
	Week 13+14	Presentations	TBA
	Week 15	Final exam	TBA

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CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Managerial Economics

The University of Jordan, the School of Business, Department of Business Economics

Instructor Information

Instructor: Dr. Mohammed Alawen.

Office Location: The School of Business / Business Economics Department -Building #1 First Floor.
Telephone: 5355000 ext.
Office Hours:
E-mail:

Course Identification

Course Number:
Course Name: Managerial Economics
Course Location:
Class Times:
Prerequisites: 1607210 and 1607211
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

Economic theory is the fundamental determinant of firms' profitability and growth, and economic thinking should be an essential element in nearly every managerial decision. In this course, we will examine the principles of microeconomics, and show how they apply to managerial decision-making. It explains how and why economic theory is used to analyze business problem. In this course we will start with part one; preliminaries (market equilibrium, optimal decisions and Basic estimation techniques), then explore part two demand analysis and its applications (elasticity and demand estimation and forecasting). In part three the production and cost analysis will be or main topic. In part four the student will learn hoe the firms maximize their profits in various market structures. In this particular part we will introduce a very important topic that can be related to take optimal decisions under risk and uncertainty with present of externalities. The climate change will be introduce as a hot topic from utilitarian perspective, the environment is taken into consideration only to the extent that it is useful to humans and then to the policy makers that may affect the standing of firms and global business. Economists are concerned with the environment in so far as it affects the wellbeing of human societies. Whereas environmentalists are concerned about natural systems, economists are primarily interested in natural resources. The economic model focuses on the efficiency of the use of natural

resources in the production process. The ecological model places value on the long-term sustainability of natural systems. These dissimilar standards imply different goals for economic activity. We will try to explore these different situations and decision making within climate and einvernoment changes.

Course Learning Objectives

6. To equip the student with the principles he or she needs to make sense out of the conflicting and contradictory discussions of economic conditions and policies in newspapers and news magazines.
7. Enable the student to evaluate the performance of decision makers, and to predict the impact of their policy actions on families and business.
8. Understand and predict the economic forces shaping real-world business decisions.
9. Develop and strengthen overall analytical skills.
10. Develop critical thinking skills about markets and business decisions.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- Knowledge and Understanding:**

- Understand managerial behavior regarding maximizing the profit of the firm under different market structure.
- Understand managerial reaction concerning government policy and activities.
- Understand mathematical methods (Derivative, linear programming), and statistical techniques (regression – model) to help managers taking optimal decisions under risk and uncertinity.

LO **2- Analytical and Thinking Skills**:

Students should have the ability to:

- Present written and/or oral reports using critical thinking, economic data, and economic theory.

- Perform mathematics, and statistical knowledge and its application on economic- decision of the firms.
- Comprehend and communicate data presented graphically and/or mathematically.
- relate mathematical and statistical models to their assumptions and to the real world.

LO **3- Teaching and Learning Methods**:

Lectures, case studies, problem solving and tutorials.

- Lectures: 7 weeks, 21 hours
- Discussion forums: 7 weeks, 21 hours
- Tutorials: 2 weeks, 6 hours
- Applications (office hours): as requested

Course Resources

There will be 3 lectures per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical cases presented in the book.

Course Website(s)

-

Required Course Texts and Materials

- (Managerial Economics) 10th edition, 2011. *McGraw Hill* By: Thomas and Maurice.

- The Microeconomics of Urban Adaptation to Climate Change in Europe Matthew E. Kahn UCLA and NBER Institute of the Environment Department of Economics and Public Policy Mek1966.googlepages.com.

- Microeconomics and the Environment Global Development And Environment Institute Tufts University Medford, MA 02155 http://ase.tufts.edu/gdae A GDAE Teaching Module on Social and Environmental Issues in Economics by Jonathan M. Harris and Anne-Marie.

.Optional Course Texts and Materials

- **Nick Hanley, Jason Shogren, and Ben White, *Introduction to Environmental Economics*.**

Assignments and Grading Scheme

Grading System

A , A- Excellent
B+ , B, B- Very good
C+, C, C- Good
D+ , D, D- pass
D-, F = Fail

Grading Policy

Students will be assessed based on the following:

Mid-term Exam 30%
Second exam 15%
Participation 5%
Final Exam 50%

Assignments are individual assignments. Details of these assignments and the submission deadlines will be announced in class.

Course Policies

University Policies regarding class attendance, course pre-requisites, and academic honesty, grading, incompletes, and final exams will be observed as stated in the University of Jordan. You are responsible for all material discussed in class and assigned in the textbook. Missing class is strongly discouraged. Your professor is far less sympathetic to those who miss class regularly. If you miss class, you are responsible to get the notes from a classmate.

Any type of academic misconduct will result in (F). By Enrolling in this course, you agree with the University of Jordan Policy on Academic Misconduct.

Course Schedule

Detailed lecture schedule			
	Week:	Material:	Homework and Assignments
	Week 1	Ch (1): Managers, Profits and Markets(2-28)	TBA
	Week 2+3	Ch (2): Demand, Supply, & Market Equilibrium (36-64).	TBA
	Week 4	Ch (6): Elasticity and Demand (204-229)	TBA
	Week 5+6+7	Ch (3): Marginal Analysis for Optimal Decision	TBA

		Making(86-108) Ch (7): Demand Estimation & Forecasting(243-262)	
	Week 8+9	Ch (8+9): Production and Cost in the Short (284-312),and long Runs (320-359),	TBA
	Week 10	Ch (10): Production and Cost Estimation (371-377)	
	Week 11+12	Ch (11): Managerial Decisions in Competitive Markets (398-441)	TBA
	Week 13+14	Ch (12): Managerial Decisions for Firms with Market Power. (453-478)	TBA
	Week 15	Advanced topic in Managerial Economics: Microeconomics of climate change and risk management.	
	Week 16	Final exam	TBA

(8)

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Environmental Economics

University of Jordan, Faculty of Business, Department of Business Economics

Instructor Information

Instructor: Khawlah A. Abdalla Spetan, Assistant Professor

Office Location: Faculty of Business / Business Economic Department -Building #1 first floor.
Telephone: 5355000 ext. 24163
Office Hours: TBD
E-mail: khawlah.spetan@ju.edu.jo, khawlahs2000@yahoo.com

Course Identification

Course Number:
Course Name: Environmental Economics
Course Location: TBD
Class Times: TBD
Prerequisites:
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This course tries to shed the light on a very important issue that started to affect all aspects of our life. Students will be introduced to the environmental issues from economics point of view. It offers an integrated understanding of environmental and natural resource economics. Important principles and concepts will be presented to provide students with clear understanding for contemporary environmental and natural resource issues and policy considerations. The course includes real world case studies to demonstrate the policy relevance and implications of key notions. Many areas of economics and impact of environmental policies will be covered. Basic concepts of environmental economics will be explored and examined, such as the economics of natural resource scarcity, climate change, environmental pollution, natural disasters, the economics of pollution, and the economics of sustainable development. The course provides an introduction to the subject of environmental economics without assuming any in-depth prior knowledge of economics. Part one explains the fundamental

economic concepts. Part two uses these concepts in understanding and developing policy responses to some of the major environmental issues of our time. Examples will be drawn from all over the world and include such fundamental issues as climate change, water pollution, and loss of biodiversity.

Course Learning Objectives

The main objectives of this course are:1) increasing awareness towards the contemporary environmental issues caused by various human activities. 2) Identifying the issues of environmental pollution and global economic and development effects. 3) Cost Benefit Analysis of the various economic activities to determine their environmental impacts. 4) Understanding the economics of climate change and its impact on economic development issues.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- knowledge and understanding:**

- Understanding the linkages between economics and environmental issues.
- Understanding economic concepts in the context of environmental problems.
- Understanding the problems of climate change, water pollution, and loss of biodiversity within global overview of environmental issues.
- Understanding the various possible policy responses to major environmental issues.

LO **2- analytical and thinking skills**:

Students should have the ability to:

- Apply microeconomic theory to the study of environmental issues.
- Identify and critically evaluate alternative environmental policy instruments.
- Develop written and verbal skills in communicating an environmental economic perspective.

LO **3- Teaching and learning methods**:

- There will be 2 lectures per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical cases presented in the book.

- A number of problems (end-of-chapter problems) will be indicated in class, to be submitted by students. Students should attempt the homework and should prepare to discuss the assigned problems in the class.

Course Resources

Course Website(s)

- http://blackboard.ju.edu.jo

Required Course Texts and Materials

- **Handouts prepared by the instructor for the class.**
- Field, Barry C. and Martha K. Field, Environmental Economics, 5th Edition (San Francisco, CA: McGraw-Hill, 2009).

Optional Course Texts and Materials

• Keohane and Olmstead, *Markets and the Environment* (Island Press, 2007)
• Matthew Kahn, *Fundamentals of Environmental Economics: Solving Urban Pollution Problems.*

• Charles Kolstad, *Environmental Economics* (Oxford University Press, 1st edition 2000, or 2nd edition 2010)

• *The RFF Reader in Environmental and Resource Policy* (Wallace Oates Editor, 2nd edition 2006, RFF Press)

Assignments and Grading Scheme

Grading System

A , A- **Excellent**
B+ , B, B- **Very good**
C+, C, C- **Good**
D+ , D, D- **pass**
D-, F = **Failure**

Grading Policy

Students will be assessed based on the following:

Mid-term Exam	30%
Second exam	7%
Participation	5%
Short Paper	8%
Final Exam	50%

Details of assignments and the submission deadlines will be announced in class.

Course Policies

Late Assignments policy

All assignments are due at the beginning of class. Anything turned in after that will be considered late. Assignments will be accepted up to four days after the due date for half credit. Assignments will not be accepted at all after the four-day extension. Excessive absenteeism and late or missing work will result in lower grades. Contact with your teacher is strongly encouraged especially in the case of being absent. Additionally, please read the college's policy regarding absence and make-up work.

Classroom Protocol

We oblige ourselves to a high standard of professional behavior. Accordingly, lateness, holding private conversations and indeed any behavior that interrupts me or your colleagues will be considered improper. Using cell phones is forbidden in the class. Repeated violations of this standard may affect your participation grade or may cause withdrawal from course.

Course Schedule

Detailed lecture schedule		
Week:	**Material:**	**Homework and Assignments**
Week 1+2	**I. INTRODUCTION** **Economics and the Environment: Introduction** What is Environmental Economics? Ch. 1 and Ch. 2.	TBA

	Week 3+4	**ENVIRONMENTAL ECONOMIC ANALYSIS** **B. Environmental Analysis** Benefits and Costs, Supply and Demand, Ch. 3 Economic Efficiency: Markets, Ch. 4. Economics of Environmental Quality, Ch. 5	TBA
	Week 5 + 6	***B. Analytical Methods*** Framework of Analysis Ch. 6 Benefit-Cost Analysis: Benefits Ch. 7 Benefit-Cost Analysis: Costs Ch. 8 **MIDTERM EXAMINATION** Chapters (1 – 8)	TBA
	Week 7	ENVIRONMENTAL POLICY ANALYSIS **A. Criteria and Strategies** Criteria for Evaluating Environmental Policies, Ch. 9 Decentralized Policies: Liability Laws, Property Rights, Moral Suasion", Ch. 10	TBA
	Week 8 + 9	Command-and-Control Strategies: The Case of Standards, Ch. 11 Incentive-Based Strategies: Emission Charges and Subsidies, Ch. 12	TBA
	Week 10	Incentive-Based Strategies: Transferable Discharge Permits, Ch. 13	TBA
	Week 11	**B. Water Pollution** Water Pollution-Control Policy, Ch. 14	TBA

	Week 12	**C. Air Pollution** Air Pollution-Control Policy, Ch. 15	TBA
	Week 13+14	***D. Waste Pollution*** Government Policy on Toxics and Hazardous Substances, Ch. 16 State and Local Environmental Issues, Ch. 17	TBA
	Week 15	Final exam	TBA

Capstone Courses:

Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category

0300150	Community Service	---	Business economics	Business	University Requirement
1607311	Scientific Research in Economics	1607150	Business Economics	Business	Department Core

(9)
Community Service

(10)

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number: **1607311**
Scientific Research in Economics
University of Jordan, Faculty of Business, Department of Business Economics
…… Semester, ……

Instructor Information

Instructor: Dr.Dalal Alkadi
Office Location: Faculty of Business / Business Economics Department – Building #2, 2^{ed}floor

Telephone: 5355000 ext. 24160
Office Hours:
E-mail: d.alkadi@ju.edu.jo
Website: www.ju.edu.jo

Course Identification

Course Number: **1607311**
Course Name: **Scientific Research in Economics**
Course Location:
Class Times:
Prerequisites: Principles of Statistics 1607150
Faculty Web Page: www.ju.edu.jo

Course Description/Overview

Covers these topics: the concept of scientific research and its definition, and kinds of scientific research, stages and objectives of scientific research, kinds and sources of data and data collection: Questionnaire, population and sample: kinds of sampling, the relation between statistics and scientific research, implementation and analyzing data using statistical methods with SPSS, finally writing reports.

Course Learning Objectives

Providing students with concepts and definition and the importance of scientific research, also providing students with skills in choosing the appropriate way of writing the Questionnaire, the statistical analysis and writing the final report.

Note: Students who are involved in CLIMASP sertificate can apply their research work on environmental issues.

Course Content Learning Outcomes

A. Knowledge and Understanding:

Students should have knowledge of:

- The main concepts of scientific research, and its importance.
- How to think wisely and scientifically.
- How to write questions in the Questionnaire.
- How to deal with the data.

B. Intellectual Analytical and Cognitive Skills:

Student is expected to:

- Write the questions in the Questionnaire correctly.
- Choosing and applying the appropriate statistical analysis.
- Writing the reports.

Course Resources

Hands-out prepared by the instructor for the class

Alkadi, D. (2008), "Methodology and techniques of Scientific Research and Data Analysis using SPSS".

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following:

Evaluation	Point %	Date
Midterm Exam	30	TBA
Second Exam & assignments	20	TBA
Final Exam	50	TBA
Total Points	**100**	

Course Policies

Learning Methodology

Duration: 16 weeks, 48 hours in total
Lectures: 42 hours, 3 per week (including two 1-hour term exams)
Although the lectures cover the vast majority of the course material, students must use the text book.
A number of problems (some could be chosen from the end of chapter problems) will be indicated in class, specifying their due time. A discussion of the assigned problems can be done through the preceding lectures. Also, applying all steps for different statistical methods using SPSS by students.

Classroom Protocol

Details of the assignments and the submission deadlines will be announced in class and/or posted on the course website. Students are advised to keep track of what is announced in class, it is their responsibility to do so, BEING ABSENT IS NOT AN EXCUSE FOR NOT KNOWING WHAT IS GOING ON.

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations.Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Contents

Content	Reference	Week	ILO/s
Introduction to scientific research methodology: - Definition of scientific research. - Kinds of scientific research. - The role of researchers in scientific research. - The role of government and		1	A&B

companies in scientific research.			
- Stages for research development. - Methods and types of scientific research.		2	A&B
- Stages in scientific research. - Objectives of scientific research.		3	A&B
Data and observations: - Kinds of data. - Sources of data. - Data collection.		4	A&B
Questionnaires.		5	A&B
Population and samples: kind of samples.		6	A&B
Statistics: - Relationship between the definition of statistics and scientific research methodology. - Relationship between statistical methods and scientific research methods. - Relationship between statistical theory and scientific research methodology.		7	A&B
Starting the program SPSS: - Entering the data and creating files. - Descriptive statistics and its applications.		8	A&B
- Statistical graphical methods and its applications. - Inferential statistics methods.		9	A&B

- Statistical method determination. - Statistical methods and its applications.		10	A&B
- Applying the steps to write Questionnaire. - Applying the steps to analyze data. - Starting writing reports.		11	A&B
- Methods and rules in writing Quotations. - Methods and rules in writing footnotes.		12	A&B
- Methods and rules in writing references. - Methods and rules in writing reports.		13	A&B
Recognizing the parts of the report which are preliminaries, the body of the research, and the appendix.		14	
Presenting the reports by students.		15	
Presenting the reports by students.		16	

University of Jordan

Course Classification:

13. Core Courses (*for All Euro Pass Candidates*)
14. Elective Courses (*from Student Major or Group*)
15. Capstone Course
16. Additional Elective Courses

Core Courses:

*Two courses (6 Credit Hours), one from each other groups as in the following Table:

Group	Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category
Environment and Society	2305100	Introduction to Sociology	---	Sociology	Arts	University Elective
Economics and Public Policy	1607100	**International political economy	---	Business Economic	Business	University Elective
Science and Technology	0305100	Environment	---	Geology	Science	University Elective

Elective Courses:

Two programs from the Economics and Public Policy are involved, namely, Business Economics and Finance. Six courses (18 Credit Hours) may be taken by student from his major or other majors within the group.

Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category
1607330	International Trade Theory	1607110	Business Economics	Business	Dept. Core
1607415	Economic development	1607111	Business Economics	Business	Dept. Core
1607431	International Finance	1607111	Business	Business	Dept. Core

			Economics		
1607411	Contemporary Economic Issues	1607111	Business Economics	Business	Dept. Core.
1607225	Industrial Economics	1607110	Business Economics	Business	Dept. Core.
1607421	Managerial Economics	1607110	Business Economics	Business	Dept. Core.
New course	Environmental Economics	-	Business Economics	Business	Dept. Elective
1603450	Contemporary Issues in Finance	1603301	Finance	Business	Dept. Core
1603416	Financial Planning and Control	1603211	Finance	Business	Dept. Elective
1603315	**Entrepreneurship in Finance**	1603211	Finance	Business	Dept. Elective
1603444	**Risk Management**	1603443	Finance	Business	Dept. Elective

Capstone Course:

This course is based on design and/or practical training for senior students. Depending on the student major, the following courses fit as capstone course provided the training is conducted in the field of climate change and environmental sustainability. 6 Credit Hours.

Course Code	**Course Title**	**Prerequisite**	**Department**	**Faculty (College)**	**Course Category**
0300150	Community Service	---	Business economics	Business	University Requirement
1607311	Scientific Research in Economics	1607150	Business Economics	Business	Department Core

Additional Elective Courses

The following list contains courses than can be taken by student in case he/she wishes to diversify knowledge or unable to register in elective courses offered by his/her Department.

**A student cannot register in a university elective course offered by the Department of his/her major.
***The student will take 8 Courses (24 hrs). Student will take 6 courses from her/his field and the other 2 courses will be from the core courses. With the 6 hrs capstone course the total credit hours are 30 hrs.

Climate Change and Economics & Public Policy Core

Courses Syllabi

Core Course:

Group	Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category
Economics and Public Policy	1607100	**International political economy	---	Business Economic	Business	University Elective

(1)

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

International Political Economy

The University of Jordan, The School of Business, Department of Business Economics

Instructor Information

Instructor:

Office Location: The School of Business / Business Economics Department -Building #1 First Floor.

Telephone: 5355000 ext.

Office Hours:

E-mail:

Course Identification

Course Number: 1607100

Course Name: International Political Economy

Course Location:

Class Times:

Prerequisites: None

Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This course seeks to explore the interaction of economics and politics in global affairs- the struggle for power and wealth within the international system. The course begins by identification of the economic science and economic problem, the development of economic thought across different economic schools, concentrating on their different standpoints regarding the role of the government in the economic activity. The course aims also to study and analyze different economic systems and their characteristics.

Special emphasis will be placed on the international dimension of political economy, focusing on the interconnected political and economic structures of the world and considering the undergoing enormous change, in order to understand the key elements of this change and see which paths lead to the most promising future. While the questions of international monetary, financial and trading systems are of particular importance, other topics of interest include: the flow across borders of goods, capital, foreign investment and migration ;role of multinational corporations, regional economic organizations and their role in economic integration, environmentally sustainable development, climate change, and prospects for welfare as an economic, political, technological and socio-cultural ongoing process.

Course Learning Objectives

The main goals of this course are to:

- Raise awareness that neither international politics nor international economics can be understood in isolation.
- Focus attention on the four types of cross-border flows (goods, capital, .investment and migration),and the polices- set forth by domestic and international institutions and arrangements- that regulate these flows.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- Knowledge and Understanding:**

A1) Understand the major theoretical perspectives on international political economy, the assumptions concerning appropriate unit analysis and nature of interactions between units on which they are based, and their implications for policy.
A2)) Learn how economic organizations on the national and international levels compete and integrate with each other.
A3) Understand the importance of the ecological constraints on economic growth and development.
A4) Try to investigate the extent of the Jordanian economy to influence and be affected by the world economy.

LO **2- Analytical and Thinking Skills**:

Students should have the ability to:

B1) Indentify and evaluate institutional, political, cultural and economic constraints on the speed and effectiveness of political and/or economic positive change in developing countries.
B2) Collect and analyze relevant data associated with international political economy.

LO **3- Teaching and Learning Methods**:

- Lectures, dialogue and discussion.
- Research.
- Cooperative learning.
- Brain – storming.

Course Resources

Course Website(s)

- http://blackboard.ju.edu.jo

Required Course Texts and Materials

- **Balaam, David N. , and Bradford Dillman.. " *Introduction to International Political Economy* "5th ed. Longman 2010.**
- **Oatley, Thomas.2011. " *International Political Economy*", 5th Edition. New york, Longman.**

- Joseph E. Stiglitz " *Globalization and its Discontents*, " New York : Norton, 2002.

Optional Course Texts and Materials

-

Assignments and Grading Scheme

Grading System

A , A- **Excellent**
B+ , B, B- **Very good**
C+, C, C- **Good**
D+ , D, D- **pass**
D-, F = **Fail**

Grading Policy

Grades can be based on the following :

Attendence	**5 %**
Mid-term exam	**30%**
Final exam	**50%**
Participation in the seminars	**10%**
Short Paper	**5%**
Total	**100%**

Course Policies

University Policies regarding class attendance, course pre-requisites, and academic Honesty, dropout, grading, incompletes, and final exams will be observed as stated in the University of Jordan. You are responsible for all material discussed in class and assigned in the textbook. Missing class is strongly discouraged. Your professor is far less sympathetic to those who miss class regularly. If you miss class, you are responsible to get the notes from a classmate.

Any type of academic misconduct will result in (F). By Enrolling in this course, you agree with the University of Jordan Policy on Academic Misconduct.

Course Schedule

Week	Material
1	Introduction and basic concepts
2	Definition of economic science and economic problem
3+4	Development and analysis of different schools of economic thought
5+6	Economic systems + first exam
7	Sustainable global development
8	Financial systems and fiscal policy
9+10	International finance, third world debt and the macroeconomic stabilization controversy
11	Trade policy, regional and world trade organizations
12	Direct foreign investment and foreign aid
13	The global environmental threat
14	Climate protection
15	Final Exam

Elective Courses syllabi:
(2)

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

International Trade Theory

The University of Jordan, The School of Business, Department of Business Economics

Instructor Information

Instructor: Buthaina M.A.Muhtaseb, Associate Professor

Office Location: The School of Business / Business Economics Department -Building #1 first floor.

Telephone: 5355000 ext. 24839

Office Hours:

E-mail: b.muhtaseb@ju.edu.jo, b.muhtaseb@yahoo.com

Course Identification

Course Number: 1607330

Course Name: International Trade Theory

Course Location:

Class Times:

Prerequisites: Principles of Microeconomics (1607110)

Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This courses analyzes the causes and consequences of international trade. Various theories of international trade and its extensions will be explained and evaluated in both perfect and imperfect competition, with some reference to the empirical evidence. Some of the essential questions that will be addressed: Why do countries trade? Are countries better off because they trade? Are both trading partners better off? Who gains and who loses within a country? What is the relation between trade and growth? What if markets don't work perfectly? How does that affect our assessments?

Course Learning Objectives

1-To introduce students to international economic concepts and ideas.
2- To develop the ability to reason accurately and objectively about international economic issues.
3- To aid students in judging what kinds of decisions, policies, and behavior are sensible from an international perspective.
4- Enable students to understand international trade flows incentives, directions, and effects.
5- To highlight the relation between international trade and economic growth and welfare. (Welfare should not be measured by the rise in consumption only. Other aspects as good social relations, and clean nature should be considered).

Course Content Learning Outcomes (ILOS)

Successful completion of this course should lead to the following learning outcomes:

LO1- Knowledge and Understanding:

A1) Understand basic concepts of foreign trade.
A2) Demonstrate knowledge and understanding of different international trade theories
A3) Understand foreign trade structure of Jordan
A4) Describe and understand the links between foreign trade and growth
A5) understand international trade under different market structures (competitive versus noncompetitive markets)

LO2- Intellectual Skills:

B1) Prepare and present reports using critical thinking, trade data, and international trade theories
B2) Explain the mechanisms of international flows of commodities and factors
B3) Relate local economic developments to international economic developments
B4) Use computers and internet to access trade flows data and sources.

LO3- Subject Specific Skills:

C1) Apply international trade theories to relate domestic equilibrium prices to foreign prices

C2) Employ trade models to analyze the effects of trade on production, prices and terms of trade, and economic growth
C3) Use micro and macro-economic tools to assess net gains from international trade
C4) Develop the skills required to relate domestic economy equilibrium/disequilibrium to domestic and foreign influences
C5) Analyze international commodities flows directions and causes, and explain migration incentives and disincentives.

LO4- Transferable Skills:
D1) Gather data for basic economic research from various sources, including the computer and other forms of electronic media, such as the Internet.
D2) Acquire English language command of international trade concepts and definitions.
D3) Demonstrate knowledge and skills necessary for integrating information technology into global trade**.**

Teaching and Learning Methods

Duration: 16 weeks, 48 hours in total
Lectures: 28 hours, 3 per week (including two 1-hour midterm exams)
Case study: 8 hours
Tutorials: 6 hours
Applications: 6 hours
Laboratory: -

Teaching Methods					
Methods	**Lectures**	**Case study**	**Tutorials**	**Laboratory**	**Applications**
Objectives learning outcomes	A1 A2 A3 A4 A5 B2 B3 B4 C1 C2 C3 C4 C5 D2	A3 A5 B1 B4 C4 D1 D3	A3 A4 A5 B1 B4 C2 C5 D1	-	A2 A4 A5 B3 C1 C2 C3 C5 D1 D3
Assessments	Exams + Assignments	Exams + Assignments	Project + Assignments	Project + Assignments	Exams + Assignments

To be assigned later in class

Assignments and Grading Scheme

Mid-term Exam	**30%**
Short Paper (1)	**7%**
Participation/Attendance	**5%**
Quiz	**8%**
Final Exam	**50%**
Total	**100%**

Course Policies

Academic Honesty

Course Requirements

Course Website(s)

- http://blackboard.ju.edu.jo

Required Course Texts and Materials

- Awad Talib***, "International Trade: Theory and Policy" ,*** The University of Jordan, Amman, 1995.
- Krugman R. Paul and Obstfeld Maurice, "***International Economics: Theory and Policy***", seventh Edition. Boston: Addison-Wesley, 2008

Optional Course Texts and Materials

All the assignments and work submitted by the student should be his or her own. All actions of academic dishonesty including cheating, plagiarism or helping other students in such actions will be dealt with strictly according to the university regulations.

Course Schedule

Week	Materials
1	Unit 1: Introduction to International Economics -Causes of trade. -Patterns of trade. -Gains from trade. * Fair Trade. * Drawbacks of Free Trade
2+3+4	Unit 2: Labor Productivity and Comparative Advantage - Dynamic comparative advantage and ethics. + **Exam 1**
5+6+7	Unit 3: Resources and Trade: The Heckscher-Ohlin Model - The role of resources in explaining foreign trade. - The concept of sustainability and its relation to natural resources. - Each generation should leave the environment not worse off, and not damaged by depletion of resources

	or pollution of land, water and atmosphere.
8+9	Unit 4: The Standard Trade Model - Income Distribution (Who gain and who loses from free trade within a country? - Trade Development and Growth * Interaction between the three dimensions of development : economic, social and environmental. * Growth and sustainability (Is the traditional macroeconomic goal of economic growth compatible with the long term goal of sustainability?) - Trade and the environment * Analysis combining trade theory with the theory of externalities to show how the basic principle of gains from trade must be modified in a real world with many environmental complications. * The issues of sustainable trade and "greening" global environment institutions encourage the student to place the theoretical issues in the context of real – world policy.
10+11	Unit 5: Modern Theories of International Trade: Economies of Scale, Imperfect Competition, and International Trade. - The Gravity Modal (The role of language, history and culture in addition to other factors in enhancing exports and imports.

	+ **Exam 2**
12	Unit 6: International Factor Movements -Immigration -Multinational Enterprise - Linkages between international Labor and capital mobility (Investor rights, Labor standards).
13+14	Unit 7 : Trade Polices and Trade Agreements - Tariffs and Quotas. - Some nontariff barriers are unfair(Indirect way of developed countries to reduce imports from developing countries) - Trade liberalization and the WTO, IMF, WB (suspicious roles?)
15	Unit 8 : Application on Foreign Trade to Jordan - Real cases (trade and the environment in Jordan). - Computation of "terms of trade" of Jordan, their change over time and the impact of this change on welfare" + **Exam 3 (Final): Cover all units with higher weights given to units not covered in the previous exams.**

(3)

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Economic Development

University of Jordan, Faculty of Business, Department of Business Economics

Instructor Information

Instructor:

Office Location: Faculty of Business / Business Economic Department -Building #1 first floor.

Telephone: 5355000 ext. 24163

Office Hours: Day(s) time Sun., Tues. & Thur. 12:00-1:00

Mon. & Wed. 11:00-12:00

E-mail: khawlah.spetan@ju.edu.jo, khawlahs2000@yahoo.com

Course Identification

Course Number: 1607415
Course Name: Economic Development
Course Location: University Campus
Class Times: Mon, Wed 12:30-2:00
Prerequisites: 1607111 Principle of Macroeconomics
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This course introduces the theory of growth and economic development, providing a qualitative and analytical perspective of economic transformation of developing countries for undergraduate students. It tries to provide an explanation for the exceptional progress that has been made in many parts of the developing world, but fully deals with the massive problems and challenges that remain to be addressed in the years ahead. It explains measurements of and obstacles to growth and development and tries to explore the difficulties that confront the sustainable development policies. The module focuses on the theory of growth and development and its interaction with trade, population, poverty, and income distribution. The pace and extent of economic development continues its prompt, imbalanced, and sometimes unexpected evolution. The course has been divided into two parts, the first part is about concepts and principles and includes three sections; an introduction of economic development from global perspective, comparative economic development and analysis of convergence, and Classic theories of economic growth and development. The second part is about problems and polices that faces the development in less developing countries; poverty inequality and development, Population Growth and Economic Development and finally the environment and development, basic issues in Global warming and climate change and its fallout on economic development.

Course Learning Objectives

- The main objectives of this course are: 1) to offer an analytical approach to the concepts related to growth and economic development in the context of sustainable development. 2) to equip students with appropriate tools and techniques that help them to analyze situations related to growth and development such as poverty and inequalities …. 3) draw the attention to some issues in environmental pollution and global economic and its relation with economic development. 4) realize the climate change consequences on sustainable economic development. 5) to provide students with the resources to draw independent conclusions as they confront development problems.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- knowledge and understanding:**

- Understanding different theories related to economic development
- Comparing developing and developed countries experiences.
- Understanding the aims of development and how to reach them through the different sectors of the economy.
- Classifying the stages of economic development.
- Identifying the problems related to sustainability and the impact of climate change in economic development over time.

LO **2- analytical and thinking skills**:

Students should have the ability to:

- Comparing theories and finding the best suitable one which can be applied in Jordan economy.
- Developing some of the core models in poverty and inequality measurement and analysis.
- Highlighting and developing some of the core models in microeconomics of fertility and relationships between population growth and economic growth.
- Discuss the relationship between the environmental economics models and the sustainable economic development.

LO **3- Teaching and learning methods**:

- There will be 2 lectures per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical and the qualitative cases presented in the book.

- A number of problems (end-of-chapter problems) will be indicated in class, to be submitted by students. Students should do the homework and should come to class prepared to discuss the assigned problems.

Course Resources

Course Website(s):

- http://www.global-economic-symposium.org/knowledgebase/the-global-environment/climate-change-and-economic-development.

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class.
- Todaro, M. and S. Smith, Economic Development, 11th edition,2012
- **Robert E. LUCAS, Jr., On the Mechanics of Economics Development,** University of Chicago, Chicago, 1L 60637, USA,1988.
- Human Development Report 2011. Sustainability and Equity: A better future for All, UNDP.
- Anthony D. Owen & Nick Hanley, The Economics of climate Change, Routledge,2004.
- **http://www.unep.org/pdf/ourplanet/op_english_17v2.pdf**
- **https://environment.yale.edu/files/biblio/YaleFES-00000397.pdf**
- فايز ابراهيم الحبيب، نظريات التنمية والنمو الاقتصادي
- سالم النجفي، مقدمة في اقتصاد التنمية
- عبد الوهاب الأمين، التنمية الاقتصادية: السيسات والمشكلات

- تقرير حالة الفقر في الأردن، إستناد اً لبيانات مسح نفقات ودخل الأسرة،2010، دائرة الإحصاءات العامة، الأردن.

Assignments and Grading Scheme

Grading System

A , A- Excellent
B+ , B, B- Very good
C+, C, C- Good
D+ , D, D- pass
D-, F = Failure

Grading Policy

Students will be assessed based on the following:

Mid-term Exam	30%
Second exam	7%
Participation	5%
Short Paper	8%
Final Exam	50%

Assignments are individual assignments. Details of these assignments and the submission deadlines will be announced in class.

Course Policies

Late Assignments policy

All assignments are due at the beginning of class. Anything turned in after that will be considered late. Assignments will be accepted up to four days after the due date for half credit. Assignments will not be accepted after the four-days extension. Excessive absenteeism and late or

missing work will effect in lowered grades. Contact with your teacher is strongly encouraged especially when you have been absent. In addition, please see handout on the college's policy on absence and make-up work.

Classroom Protocol

We oblige ourselves to a high standard of professional behavior. Accordingly, lateness, holding private conversations and indeed any behavior that interrupts me or your colleagues will be considered improper. Using cell phones is forbidden in the class. Repeated violations of this standard may affect your participation grade or may cause withdrawal from course.

Course Schedule

Detailed lecture schedule			
	Week:	**Material:**	**Homework and Assignments**
	Week 1+2	Ch 1: Introduction	TBA
	Week 3+4	Ch 2:Comparative economic development First Exam	TBA
	Week 5+6	Ch 3:Classic theories of economic growth and development	TBA
	Week 7+8	Ch 5: Poverty, inequality and development Second Exam	TBA
	Week 9+10	Ch 6: Population growth and economic development	TBA
	Week 11+12	Ch 10: Environmental and Economic Development	TBA

	Week 13+14	Climate Change and its consequences on Economic Development	TBA
	Week 15	Final exam	TBA

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CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

1607421: International Finance

University of Jordan, Faculty of Business, Department of Business Economics

Spring, 2014

Instructor Information

Instructor: Khawlah A. Abdalla Spetan, Assistant Professor

Office Location: Faculty of Business / Business Economic Department -Building # first floor

Telephone: 5355000 ext. 24163

Office Hours: Day(s) time: Sun., Tues. & Thur. 10:00-11:00
Mon. & Wed. 1:45 -2:15

E-mail: khawlah.spetan@ju.edu.jo, khawlahs2000@yahoo.com

Course Identification

Course Number: 1607421

Course Name: International Finance

Course Location:

Class Times: Monday & Wednesday 11:00 – 12:15

Prerequisites: 1607111, Macroeconomics principles

Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This is a course in international monetary economics, which includes the connection between the exchange rates and international macroeconomic policies. The subject of international finance draws its importance from the consequences of worldwide economic policies on a country economy's main outcomes (Employment, National Saving, Trade Balance and Price levels and Money). The course divided into three parts: The first part of the course will present several theories of exchange rate, and the second part will help you gather these theories into an overall analytical framework. The third part will challenge you to employ this analytical framework to real-world applications, and try to link the global financial crisis and the climate change issue. Provide students an up-to-date and understandable analytical framework for revealing current events. Help them grasp and retain the underlying logic of international finance through six to seven sections; first section we will talk about the national income accounts an d balance of payments, second section will be about the asset approach of exchange market and foreign exchange market, third section is about money market and inflation and exchange rate dynamics. In the fourth section the student will try to explore the causes of the fluctuations in exchange rate in long and short runs periods. The fixed exchange rates system will be introduced in section five. And finally in sixth section we will discuss the international macroeconomic policy and try to connect the causes of financial crisis with the most contemporary issue the climate change and their interaction.

Course Learning Objectives

The objectives of this course are: 1) introduce the main exchange rates theories and its determinants and understand the role of exchange rates in international trade . 2) students will understand the movements in macroeconomic variables such as the trade balance, the exchange rate, money, interest rate, national output, and inflation, in short and long runs. 3) Understanding how the interactions of national economies influence the worldwide pattern of macroeconomic activity.4) explore the various international currency arrangements and how did countries try to attain internal and external balance. 5) explain the linkages between the financial crisis and the environmental economics specifically the climate change issue.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- knowledge and understanding:**

- Understand the basic theory of international macroeconomics and finance.
- Understand the determination of the exchange rates in foreign exchange markets.
- Understand why exchange rates can change dramatically over periods of several years.
- Understand the complicated factors that cause output, exchange rates, and inflation to change in the short-run.
- Understand the role of the central bank foreign exchange intervention in the determination of the exchange rates under fixed and managed floating system.
- Understand how the international monetary system influenced the macroeconomic policy making during certain periods.
- Understand the performance and policy problems of the global capital market.
- Understand the international finance of climate change from different perspectives.

LO **2- analytical and thinking skills**:

Students should have the ability to:

- Analyze, in an unbiased way, a wide array of important international policy issues.
- Analyze the exchange rates movements in the modern theory of floating exchange rates.
- Relate mathematical and identification models to their assumptions and to the real world.
- Predict in somehow financial crises.
- Link the financial crisis with global warming proplem (climate change issue)

LO **3- Teaching and learning methods**:

- There will be 2 lectures per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical cases presented in the book.

- A number of problems (end-of-chapter problems) will be indicated in class, to be submitted by students. Students should attempt the homework and should come to class prepared to discuss the assigned problems.

- Case studies reinforcing material covered, illustrating its applicability in the real world.

Course Resources

Course Website(s)

- http://blackboard.ju.edu.jo
- http://www.facebook.com/groups/106367372820252
- www.cbj.gov.jo
-

Required Course Texts and Materials

- (International Economics: Theory and Policy) 8th edition, 2009. Addison Wesley, by Paul Krugman and Maurice Obstfeld.
- Climate Change and the Global Financial Crisis, Robin Leichenko, Karen O'Brien and William Solecki**.**

Climate change and the financial crisis: A case of double Exposure**,** Robin M. Leichenko, Karen L. O'Brien, and William D. Solecki**,** *Annals of the Association of American Geographers*, 100(4) 2010, pp. 963–972 C, Published by Taylor & Francis, LLC.

- The economics of climate change, Anothony D. Owen, Nick Hanley**,**2004.
- International Climate Change Financing: The Green Climate Fund (GCF). Richard K. Lattanzio Analyst in Environmental Policy, Congressional Research Service April 16, 2013.
- The Effect of the Global Financial Crisis on Climate Change, Imogen Reed. Posted on April 13, 2012 .
- Climate Change May Trigger the Next Financial Crisis.

- What is the impact of the economic crisis on the climate change debate? Question submitted by Soumaya Maghnouj, from Sciences-Po, March 22, 2013 Answered by: Daniel P. Ahn, Adjunct Fellow for Energy

- التجارة الدولية نظريات و سياسات، الدكتور طالب عوض، 1995

Optional Course Texts and Materials

- Peterson Institution for International Economics (http://www.piie.com).

Assignments and Grading Scheme

Grading System

A , A- Excellent
B+ , B, B- Very good
C+, C, C- Good
D+ , D, D- pass
D-, F = Failure

Grading Policy

Students will be assessed based on the following:

Mid-term Exam	30%
Second exam	7%
Participation	5%
Short Paper	8%
Final Exam	50%

Assignments are individual assignments. Details of these assignments and the submission deadlines will be announced in class.

Course Policies

Late Assignments policy

All assignments are due at the beginning of class. Anything turned in after that will be considered late. Assignments will be accepted up to four days after the due date for half credit. Assignments will not be accepted after the four-days extension. Excessive absenteeism and late or missing work will effect in lowered grades. Contact with your teacher is strongly encouraged especially when you have been absent. In addition, please see handout on the college's policy on absence and make-up work.

Classroom Protocol

We oblige ourselves to a high standard of professional behavior. Accordingly, lateness, holding private conversations and indeed any behavior that interrupts me or your colleagues will be considered improper. Using cell phones is forbidden in the class. Repeated violations of this standard may affect your participation grade or may cause withdrawal from course.

Course Schedule

Detailed lecture schedule			
	Week:	**Material:**	**Homework and Assignments**
	Week 1+2	-Introduction Ch (12): National Income Accounting and the Balance of Payments.	TBA
	Week 3+4	Ch (13): Exchange Rates and the Foreign Exchange Market.	TBA
	Week 5	Ch (14): Money, Interest Rates, and	TBA

		Exchange Rates. First Exam	
	Week 6	Ch (15): Price Levels and the Exchange Rate in the Long-R.	TBA
	Week 7	Ch (16): Output and the Exchange rate in Short-R.	TBA
	Week 8+9	Ch (17): Fixed Exchange Rates and Foreign Exchange Intervention +second exam	TBA
	Week 10	Ch (18): The International Monetary System, 1870-1973.	TBA
	Week 11+12	Ch (21): introduction to climate change problem	TBA
	Week 13+14	Ch (22): Developing Countries: Growth, Crisis, global warming and climate change.	TBA
	Week 15	Final exam	TBA

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Contemporary Economic Issues

The University of Jordan, the School of Business, Department of Business Economics

Instructor Information

Instructor:
Office Location: The School of Business / Business Economics Department -Building #1 First Floor.
Telephone: 5355000 ext.
Office Hours:
E-mail:

Course Identification

Course Number: 1607411
Course Name: Contemporary Economic Issues
Course Location:
Class Times:
Prerequisites: 1607210 and 1607211
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This course is primarily concerned with contemporary economic issues at the domestic, regional and international levels. Specific topics are chosen from current and recent policy debates.

Course Learning Objectives

The main objective of this course is to augment the students' comprehension of the various contemporary economic issues which arise in the world, and analyze their negative and positive effects on the Jordanian community.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- Knowledge and Understanding:**

A1) understand the new and important contemporary economic issues.
A2) understand the problems and reasons that are associated with economic issues.
A3) realize the importance of the issues of environmental economics and climate change.

LO **2- Analytical and Thinking Skills**:

Students should have the ability to:

B1) collect and analyze relevant data associated with contemporary economic issues.
B2) perform basic analytical techniques and operations in the context of economic issues.
B3) comprehend and communicate positively and effectively data presented in dialogue forums.
B4) develop analytical skills through class presentations, discussions and writing research papers.
B5) apply microeconomic and macroeconomic analysis to evaluate a current public policy.

LO **3- Teaching and Learning Methods**:

Lectures, case studies, problem solving and tutorials.

- Lectures: 7 weeks, 21 hours
- Discussion forums: 7 weeks, 21 hours
- Tutorials: 2 weeks, 6 hours
- Applications (office hours): as requested

Course Resources

Students should use course description as general guidelines. Book lists and syllabi are subject to change.

Because the course focuses on current economic issues, students will be asked to supplement the chosen textbooks with readings from newspapers, magazines, and the internet

Course Website(s)

- http://blackboard.ju.edu.jo

Required Course Texts and Materials

Although the complete list of references and textbooks materials will be assigned during the course, these books are required:

- **Bonello, Frank J. And Isobel Lobo, *Taking Sides : Clashing Views on Economic Issues.* 15th Edition. McGraw Hill, 2012.**
- **Robart, C.Guell, *Economics Today*, sixth edition, McGraw Hill, 2010.**
- **Anothony D. Owen, Nick Hanley, *The Economics of Climate Change*,2004.**

Optional Course Texts and Materials

- **Nick Hanley, Jason Shogren, and Ben White, *Introduction to Environmental Economics***

Assignments and Grading Scheme

Grading System

A , A- **Excellent**
B+ , B, B- **Very good**
C+, C, C- **Good**
D+ , D, D- **pass**
D-, F = **Fail**

Grading Policy

Students will be assessed based on the following:

Mid-term Exam	30%
Second exam	7%
Participation	5%
Short Paper	8%
Final Exam	50%

Assignments are individual assignments. Details of these assignments and the submission deadlines will be announced in class.

Course Policies

University Policies regarding class attendance, course pre-requisites, and academic honesty, grading, incompletes, and final exams will be observed as stated in the University of Jordan. You are responsible for all material discussed in class and assigned in the textbook. Missing class is strongly discouraged. Your professor is far less sympathetic to those who miss class regularly. If you miss class, you are responsible to get the notes from a classmate.

Any type of academic misconduct will result in (F). By Enrolling in this course, you agree with the University of Jordan Policy on Academic Misconduct.

Course Schedule

The contents of this course will be determined according to the economic issues that arise during a particular time period.

Below is a proposed list of some topics. We do not want to make this a formal Schedule because we want to be able to introduce topics as they arise. This may mean introducing new topics or shifting the order of the topics we have already chosen.

Detailed lecture schedule			
	Week:	**Material:**	**Homework and Assignments**
	Week 1+2	-Introduction World recession / recovery	TBA
	Week 3+4	Globalization.	TBA
	Week 5	Poverty and sustainable development First Exam	TBA
	Week 6	Assessment of the Greater Arab Free Trade Area.	TBA

	Week 7	Environmental justice: income, race and health	TBA
	Week 8+9	The transition to renewable energy. +second exam	TBA
	Week 10	The economics of climate change	TBA
	Week 11+12	Developing countries and climate change.	TBA
	Week 13+14	Climate change Cost –benefit analysis	TBA
	Week 15	Final exam	TBA

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CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Industrial Economics

University of Jordan, Faculty of Business, Department of Business Economics

Instructor Information

Instructor: Nahil I. Saqfalhait, Associate Professor
Office Location: Faculty of Business / Business Economics Department -Building #2, second floor.
Telephone: 5355000 ext. 24172
Office Hours: TBD
E-mail: nahil.saqfalhait@ju.edu.jo

Course Identification

Course Number: 1607225
Course Name: Industrial Economics
Course Location: TBD
Class Times: TBD
Prerequisites: Principles of Microeconomics (1607110)

Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

Industrial organization is essentially a branch of applied microeconomics which seeks to understand the causes and effects of various market structures on pricing and product choices. The course focuses on the theory of the firm and the industry in imperfectly competitive markets with an emphasis upon oligopoly theory, but it also addresses empirical applications of the theory. The course explains how firms compete with each other; it models firms' strategies on imperfect markets and derives the impact of firms' behavior on welfare and market structures.
We will analyze market structure, firm conduct, and economic performance of industries. Of special interest is firms' strategic behavior in price and non-price competition. The types of behavior, or conduct, include oligopoly pricing and production, strategic entry deterrence, location strategies, product differentiation, advertising, vertical and horizontal integration, and research and development. The effects of firms' conduct upon economic welfare and feedback effects upon market structure are examined. Moreover, we will analyze the acquisition and use of market power by firms, antitrust law or/and the role of government competition policy.
We will also look at how institutions and industry can shape improvements in environmental quality and support efficient allocations of resources.

Course Learning Objectives

This module aims at providing students with major topics in the field of Industrial Organization. The knowledge that the student will derive from the course is useful for further study of firms and markets as well as the study of effects of regulatory and legal systems (such as antitrust law or competitive policies) upon firms. The knowledge is also useful in further study of the internal operation of firms. Topics covered in this course are useful not only for academic consideration, but also in private enterprises, including financial and legal institutions; in government regulatory agencies; and in international trade.

Course Content Learning Outcomes

Upon the completion of this module, students should be able to achieve the following:

LO **1- knowledge and understanding:**

Students should have knowledge of:

- The definition, measurement and analysis of various key elements of industrial organization.
- Why markets are organized as they are and behave in the way they do.
- Models of competitive, oligopolistic, and monopoly markets.
- The basic dimensions of industries structure, conduct, and performance.
- Price and non-price competition among firms.
- The acquisition and use of market power by firms.
- Role of government competition policy and regulation.
- Industrial environmental economics issues.

LO **2- analytical and thinking skills**:

Students should have the ability to:

- Analyze and evaluate models of competitive, oligopolistic, and monopoly markets.
- Analyze and evaluate how firms' structure and conduct affect economic welfare and how these results feed back to effect structure and conduct.
- Explain the various types of industry structures, conduct, and performance; business strategies; and policy alternatives.
- Understand how firms make their decisions based on strategic thinking.
- Discuss theoretical and empirical issues relating to the interactions among firms in a market economy.
- Apply basic concepts of economic analysis of market structures and understand current debates concerning plausible reform of competition policy.
- Evaluate antitrust policies and other government regulations of industry.
- *Analyze environmental issues through a deeper understanding of firms' economic behavior and incentives.*

LO **3- Teaching and learning methods**:

- There will be 3 hours per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical cases presented in the book.

- A number of problems will be indicated in class, to be submitted by students. Students should attempt the homework and should come to class prepared to discuss the assigned problems.

Course Resources

Course Website

- http://blackboard.ju.edu.jo

Main textbook(s) and additional readings

- *Industrial Organization: Contemporary Theory and Empirical Applications,* 4th edition, Lynne Pepall, Dan Richards, and George Norman, Blackwell Publishing, 2008.

- *Modern Industrial Organization*, 4th Edition, Dennis Carlton and Jeffrey Perloff, Adison-Wesley, 2004.

- Hanley, N., H. Folmer (1998) *Game Theory and the Environment*. Edward Elgar Publishing.

- Dutta, P. and R.K. Sundaram (1993) "*The Tragedy of the Commons?*" Economic Theory, 3, pp. 413-426.

Assignments and Grading Scheme

Grading System

A , A- **Excellent**
B+ , B, B- **Very good**
C+, C, C- **Good**
D+ , D, D- **pass**
D-, F = **Failure**

Grading Policy

Students will be assessed based on the following:

Mid-term Exam	30%
Second exam	15%
Short Paper	5%
Final Exam	50%

The objective of the paper is to provide students with an opportunity to apply concepts from this course to a "real" market. Each student's presentation is expected to include the following three parts:
1. Clear description of the market to be discussed.
2. Complete analysis of recent strategic behavior within this market, across all relevant dimensions of firm behavior, including the choice of prices, capacity, products, advertising, R&D, entry, exit, etc.
3. Detailed analysis of one firm in this market (main focus of the presentation).

Details of the assignment and the submission deadline will be announced in class. Dates of exams will be announced in the class.

Course Policies

Classroom Protocol

We oblige ourselves to a high standard of professional behavior. Accordingly, lateness, holding private conversations and indeed any behavior that interrupts me or your colleagues will be considered improper. Using cell phones is forbidden in the class. Repeated violations of this standard may affect your participation grade or may cause withdrawal from course.

Academic Honesty

All the assignments and work submitted by the student should be his or her own. All actions of academic dishonesty including cheating, lifting or helping other students in such actions will be dealt with strictly according to the university regulations.

Course Schedule

Detailed lecture schedule			
	Week:	**Material:**	**Homework and Assignments**
	Week 1	Introduction • The field of industrial organization • Review of Firm, Market, production & cost concepts • Perfect competition compared to monopoly, the concept of economic	TBA

		efficiency	
	Week 2	The industrial organization framework • Basic conditions • Structure • Conduct • Performance	TBA
	Week 3+4	Market Structure • Economies of Scale • Barriers to Entry and Exit and Contestability • Market Concentration • Product Differentiation	TBA
	Week 5	Market Performance • Definition of market performance • Dimensions of market performance • Measuring market performance	TBA
	Week 6+7+8	Market Strategy in Oligopoly Market • The Cournot Oligopoly Model • The Bertrand Oligopoly Model • Edgworth Oligopoly Model • Stackelberg Oligopoly Model • Game Theory and Oligopoly • Cartels and Collusion • Kinked Demand Curve	TBA

	Week 9	Price Discrimination • Incentive and conditions for price discrimination • First-degree (perfect) price discrimination • Second degree price discrimination • Third degree price discrimination • Welfare effects of price discrimination	TBA
	Week 10	Mergers and Acquisitions • Reasons for mergers and acquisitions • Vertical mergers • Horizontal mergers • welfare effects of mergers • Nonprice Competition • Advertising and Information • Brandnames R&D, Patents, and Innovation Antitrust and regulation • Antitrust laws and their purposes • The objectives of regulation • Deregulation	TBA
	Week 11+ 12	Industrial Environmental Economics issues Selected topics from:	TBA

		• The impacts of environmental regulations on industrial activity • Issues in industrial proliferation and environmental preservation, pollution control policies • Game Theory and the Environment ➢ Free-riding and Cooperation in Environmental games ➢ Incentives to participate in an international environmental agreements ➢ The Economics of Exhaustible Resources ➢ The Tragedy of the Commons ➢ The Problem of Externalities	
	Week 13+14	Presentations	TBA
	Week 15	Final exam	TBA

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CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Managerial Economics

The University of Jordan, the School of Business, Department of Business Economics

Instructor Information

Instructor: Dr. Mohammed Alawen.

Office Location: The School of Business / Business Economics Department -Building #1 First Floor.
Telephone: 5355000 ext.
Office Hours:
E-mail:

Course Identification

Course Number:
Course Name: Managerial Economics
Course Location:
Class Times:
Prerequisites: 1607210 and 1607211
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

Economic theory is the fundamental determinant of firms' profitability and growth, and economic thinking should be an essential element in nearly every managerial decision. In this course, we will examine the principles of microeconomics, and show how they apply to managerial decision-making. It explains how and why economic theory is used to analyze business problem. In this course we will start with part one; preliminaries (market equilibrium, optimal decisions and Basic estimation techniques), then explore part two demand analysis and its applications (elasticity and demand estimation and forecasting). In part three the production and cost analysis will be or main topic. In part four the student will learn hoe the firms maximize their profits in various market structures. In this particular part we will introduce a very important topic that can be related to take optimal decisions under risk and uncertainty with present of externalities. The climate change will be introduce as a hot topic from utilitarian perspective, the environment is taken into consideration only to the extent that it is useful to humans and then to the policy makers that may affect the standing of firms and global business. Economists are concerned with the environment in so far as it affects the wellbeing of human societies. Whereas environmentalists are concerned about natural systems, economists are primarily interested in natural resources. The economic model focuses on the efficiency of the use of natural

resources in the production process. The ecological model places value on the long-term sustainability of natural systems. These dissimilar standards imply different goals for economic activity. We will try to explore these different situations and decision making within climate and einvernoment changes.

Course Learning Objectives

11. To equip the student with the principles he or she needs to make sense out of the conflicting and contradictory discussions of economic conditions and policies in newspapers and news magazines.
12. Enable the student to evaluate the performance of decision makers, and to predict the impact of their policy actions on families and business.
13. Understand and predict the economic forces shaping real-world business decisions.
14. Develop and strengthen overall analytical skills.
15. Develop critical thinking skills about markets and business decisions.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- Knowledge and Understanding:**

- Understand managerial behavior regarding maximizing the profit of the firm under different market structure.
- Understand managerial reaction concerning government policy and activities.
- Understand mathematical methods (Derivative, linear programming), and statistical techniques (regression – model) to help managers taking optimal decisions under risk and uncertinity.

LO **2- Analytical and Thinking Skills**:

Students should have the ability to:

- Present written and/or oral reports using critical thinking, economic data, and economic theory.

- Perform mathematics, and statistical knowledge and its application on economic- decision of the firms.
- Comprehend and communicate data presented graphically and/or mathematically.
- relate mathematical and statistical models to their assumptions and to the real world.

LO **3- Teaching and Learning Methods**:

Lectures, case studies, problem solving and tutorials.

- Lectures: 7 weeks, 21 hours
- Discussion forums: 7 weeks, 21 hours
- Tutorials: 2 weeks, 6 hours
- Applications (office hours): as requested

Course Resources

There will be 3 lectures per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical cases presented in the book.

Course Website(s)

-

Required Course Texts and Materials

- (Managerial Economics) 10th edition, 2011. *McGraw Hill* By: Thomas and Maurice.

- The Microeconomics of Urban Adaptation to Climate Change in Europe Matthew E. Kahn UCLA and NBER Institute of the Environment Department of Economics and Public Policy Mek1966.googlepages.com.

- Microeconomics and the Environment Global Development And Environment Institute Tufts University Medford, MA 02155 http://ase.tufts.edu/gdae A GDAE Teaching Module on Social and Environmental Issues in Economics by Jonathan M. Harris and Anne-Marie.

.Optional Course Texts and Materials

- **Nick Hanley, Jason Shogren, and Ben White, *Introduction to Environmental Economics*.**

Assignments and Grading Scheme

Grading System

A , A- Excellent
B+ , B, B- Very good
C+, C, C- Good
D+ , D, D- pass
D-, F = Fail

Grading Policy

Students will be assessed based on the following:

Mid-term Exam	30%
Second exam	15%
Participation	5%
Final Exam	50%

Assignments are individual assignments. Details of these assignments and the submission deadlines will be announced in class.

Course Policies

University Policies regarding class attendance, course pre-requisites, and academic honesty, grading, incompletes, and final exams will be observed as stated in the University of Jordan. You are responsible for all material discussed in class and assigned in the textbook. Missing class is strongly discouraged. Your professor is far less sympathetic to those who miss class regularly. If you miss class, you are responsible to get the notes from a classmate.

Any type of academic misconduct will result in (F). By Enrolling in this course, you agree with the University of Jordan Policy on Academic Misconduct.

Course Schedule

Detailed lecture schedule			
	Week:	Material:	Homework and Assignments
	Week 1	Ch (1): Managers, Profits and Markets(2-28)	TBA
	Week 2+3	Ch (2): Demand, Supply, & Market Equilibrium (36-64).	TBA
	Week 4	Ch (6): Elasticity and Demand (204-229)	TBA
	Week 5+6+7	Ch (3): Marginal Analysis for Optimal Decision	TBA

		Making(86-108) Ch (7): Demand Estimation & Forecasting(243-262)	
	Week 8+9	Ch (8+9): Production and Cost in the Short (284-312),and long Runs (320-359),	TBA
	Week 10	Ch (10): Production and Cost Estimation (371-377)	
	Week 11+12	Ch (11): Managerial Decisions in Competitive Markets (398-441)	TBA
	Week 13+14	Ch (12): Managerial Decisions for Firms with Market Power. (453-478)	TBA
	Week 15	Advanced topic in Managerial Economics: Microeconomics of climate change and risk management.	
	Week 16	Final exam	TBA

(8)

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Environmental Economics

University of Jordan, Faculty of Business, Department of Business Economics

Instructor Information

Instructor: Khawlah A. Abdalla Spetan, Assistant Professor

Office Location: Faculty of Business / Business Economic Department -Building #1 first floor.
Telephone: 5355000 ext. 24163
Office Hours: TBD
E-mail: khawlah.spetan@ju.edu.jo, khawlahs2000@yahoo.com

Course Identification

Course Number:
Course Name: Environmental Economics
Course Location: TBD
Class Times: TBD
Prerequisites:
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

This course tries to shed the light on a very important issue that started to affect all aspects of our life. Students will be introduced to the environmental issues from economics point of view. It offers an integrated understanding of environmental and natural resource economics. Important principles and concepts will be presented to provide students with clear understanding for contemporary environmental and natural resource issues and policy considerations. The course includes real world case studies to demonstrate the policy relevance and implications of key notions. Many areas of economics and impact of environmental policies will be covered. Basic concepts of environmental economics will be explored and examined, such as the economics of natural resource scarcity, climate change, environmental pollution, natural disasters, the economics of pollution, and the economics of sustainable development. The course provides an introduction to the subject of environmental economics without assuming any in-depth prior knowledge of economics. Part one explains the fundamental

economic concepts. Part two uses these concepts in understanding and developing policy responses to some of the major environmental issues of our time. Examples will be drawn from all over the world and include such fundamental issues as climate change, water pollution, and loss of biodiversity.

Course Learning Objectives

The main objectives of this course are:1) increasing awareness towards the contemporary environmental issues caused by various human activities. 2) Identifying the issues of environmental pollution and global economic and development effects. 3) Cost Benefit Analysis of the various economic activities to determine their environmental impacts. 4) Understanding the economics of climate change and its impact on economic development issues.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- knowledge and understanding:**

- Understanding the linkages between economics and environmental issues.
- Understanding economic concepts in the context of environmental problems.
- Understanding the problems of climate change, water pollution, and loss of biodiversity within global overview of environmental issues.
- Understanding the various possible policy responses to major environmental issues.

LO **2- analytical and thinking skills**:

Students should have the ability to:

- Apply microeconomic theory to the study of environmental issues.
- Identify and critically evaluate alternative environmental policy instruments.
- Develop written and verbal skills in communicating an environmental economic perspective.

LO **3- Teaching and learning methods**:

- There will be 2 lectures per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical cases presented in the book.

- A number of problems (end-of-chapter problems) will be indicated in class, to be submitted by students. Students should attempt the homework and should prepare to discuss the assigned problems in the class.

Course Resources

Course Website(s)

- http://blackboard.ju.edu.jo

Required Course Texts and Materials

- **Handouts prepared by the instructor for the class.**
- Field, Barry C. and Martha K. Field, Environmental Economics, 5th Edition (San Francisco, CA: McGraw-Hill, 2009).

Optional Course Texts and Materials

• Keohane and Olmstead, *Markets and the Environment* (Island Press, 2007)
• Matthew Kahn, *Fundamentals of Environmental Economics: Solving Urban Pollution Problems.*

• Charles Kolstad, *Environmental Economics* (Oxford University Press, 1st edition 2000, or 2nd edition 2010)

• *The RFF Reader in Environmental and Resource Policy* (Wallace Oates Editor, 2nd edition 2006, RFF Press)

Assignments and Grading Scheme

Grading System

A , A- **Excellent**
B+ , B, B- **Very good**
C+, C, C- **Good**
D+ , D, D- **pass**
D-, F = **Failure**

Grading Policy

Students will be assessed based on the following:

Mid-term Exam	30%
Second exam	7%
Participation	5%
Short Paper	8%
Final Exam	50%

Details of assignments and the submission deadlines will be announced in class.

Course Policies

Late Assignments policy

All assignments are due at the beginning of class. Anything turned in after that will be considered late. Assignments will be accepted up to four days after the due date for half credit. Assignments will not be accepted at all after the four-day extension. Excessive absenteeism and late or missing work will result in lower grades. Contact with your teacher is strongly encouraged especially in the case of being absent. Additionally, please read the college's policy regarding absence and make-up work.

Classroom Protocol

We oblige ourselves to a high standard of professional behavior. Accordingly, lateness, holding private conversations and indeed any behavior that interrupts me or your colleagues will be considered improper. Using cell phones is forbidden in the class. Repeated violations of this standard may affect your participation grade or may cause withdrawal from course.

Course Schedule

Detailed lecture schedule		
Week:	**Material:**	**Homework and Assignments**
Week 1+2	**I. INTRODUCTION** **Economics and the Environment: Introduction** What is Environmental Economics? Ch. 1 and Ch. 2.	TBA

	Week 3+4	**ENVIRONMENTAL ECONOMIC ANALYSIS** **C. Environmental Analysis** Benefits and Costs, Supply and Demand, Ch. 3 Economic Efficiency: Markets, Ch. 4. Economics of Environmental Quality, Ch. 5	TBA
	Week 5 + 6	***B. Analytical Methods*** Framework of Analysis Ch. 6 Benefit-Cost Analysis: Benefits Ch. 7 Benefit-Cost Analysis: Costs Ch. 8 **MIDTERM EXAMINATION** Chapters (1 – 8)	TBA
	Week 7	ENVIRONMENTAL POLICY ANALYSIS **A. Criteria and Strategies** Criteria for Evaluating Environmental Policies, Ch. 9 Decentralized Policies: Liability Laws, Property Rights, Moral Suasion", Ch. 10	TBA
	Week 8 + 9	Command-and-Control Strategies: The Case of Standards, Ch. 11 Incentive-Based Strategies: Emission Charges and Subsidies, Ch. 12	TBA
	Week 10	Incentive-Based Strategies: Transferable Discharge Permits, Ch. 13	TBA
	Week 11	**B. Water Pollution** Water Pollution-Control Policy, Ch. 14	TBA

	Week 12	**C. Air Pollution** Air Pollution-Control Policy, Ch. 15	TBA
	Week 13+14	***D. Waste Pollution*** Government Policy on Toxics and Hazardous Substances, Ch. 16 State and Local Environmental Issues, Ch. 17	TBA
	Week 15	Final exam	TBA

Capstone Courses:

Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category

0300150	Community Service	---	Business economics	Business	University Requirement
1607311	Scientific Research in Economics	1607150	Business Economics	Business	Department Core

(9)
Community Service

(10)

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number: **1607311**
Scientific Research in Economics
University of Jordan, Faculty of Business, Department of Business Economics
…… Semester, ……

Instructor Information

Instructor: Dr.Dalal Alkadi
Office Location: Faculty of Business / Business Economics Department – Building #2, 2ed floor

Telephone: 5355000 ext. 24160
Office Hours:
E-mail: d.alkadi@ju.edu.jo
Website: www.ju.edu.jo

Course Identification

Course Number: **1607311**
Course Name: **Scientific Research in Economics**
Course Location:
Class Times:
Prerequisites: Principles of Statistics 1607150
Faculty Web Page: www.ju.edu.jo

Course Description/Overview

Covers these topics: the concept of scientific research and its definition, and kinds of scientific research, stages and objectives of scientific research, kinds and sources of data and data collection: Questionnaire, population and sample: kinds of sampling, the relation between statistics and scientific research, implementation and analyzing data using statistical methods with SPSS, finally writing reports.

Course Learning Objectives

Providing students with concepts and definition and the importance of scientific research, also providing students with skills in choosing the appropriate way of writing the Questionnaire, the statistical analysis and writing the final report.

Note: Students who are involved in CLIMASP sertificate can apply their research work on environmental issues.

Course Content Learning Outcomes

A. Knowledge and Understanding:

Students should have knowledge of:

- The main concepts of scientific research, and its importance.
- How to think wisely and scientifically.
- How to write questions in the Questionnaire.
- How to deal with the data.

B. Intellectual Analytical and Cognitive Skills:

Student is expected to:

- Write the questions in the Questionnaire correctly.
- Choosing and applying the appropriate statistical analysis.
- Writing the reports.

Course Resources

Hands-out prepared by the instructor for the class

Alkadi, D. (2008), "Methodology and techniques of Scientific Research and Data Analysis using SPSS".

Grading System

0 to 10 (where 5 is the least pass mark)

Grading Policy

Grades can be based on the following:

Evaluation	Point %	Date
Midterm Exam	30	TBA
Second Exam & assignments	20	TBA
Final Exam	50	TBA
Total Points	**100**	

Course Policies

Learning Methodology

Duration: 16 weeks, 48 hours in total
Lectures: 42 hours, 3 per week (including two 1-hour term exams)
Although the lectures cover the vast majority of the course material, students must use the text book.
A number of problems (some could be chosen from the end of chapter problems) will be indicated in class, specifying their due time. A discussion of the assigned problems can be done through the preceding lectures. Also, applying all steps for different statistical methods using SPSS by students.

Classroom Protocol

Details of the assignments and the submission deadlines will be announced in class and/or posted on the course website. Students are advised to keep track of what is announced in class, it is their responsibility to do so, BEING ABSENT IS NOT AN EXCUSE FOR NOT KNOWING WHAT IS GOING ON.

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations.Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Contents

Content	Reference	Week	ILO/s
Introduction to scientific research methodology: - Definition of scientific research. - Kinds of scientific research. - The role of researchers in scientific research. - The role of government and		1	A&B

companies in scientific research.			
- Stages for research development. - Methods and types of scientific research.		2	A&B
- Stages in scientific research. - Objectives of scientific research.		3	A&B
Data and observations: - Kinds of data. - Sources of data. - Data collection.		4	A&B
Questionnaires.		5	A&B
Population and samples: kind of samples.		6	A&B
Statistics: - Relationship between the definition of statistics and scientific research methodology. - Relationship between statistical methods and scientific research methods. - Relationship between statistical theory and scientific research methodology.		7	A&B
Starting the program SPSS: - Entering the data and creating files. - Descriptive statistics and its applications.		8	A&B
- Statistical graphical methods and its applications. - Inferential statistics methods.		9	A&B

- Statistical method determination. - Statistical methods and its applications.		10	A&B
- Applying the steps to write Questionnaire. - Applying the steps to analyze data. - Starting writing reports.		11	A&B
- Methods and rules in writing Quotations. - Methods and rules in writing footnotes.		12	A&B
- Methods and rules in writing references. - Methods and rules in writing reports.		13	A&B
Recognizing the parts of the report which are preliminaries, the body of the research, and the appendix.		14	
Presenting the reports by students.		15	
Presenting the reports by students.		16	

Course Classification:

17. Core Courses
18. Elective Courses
19. Capstone Course
20. Additional Elective Courses

Core Courses:

*Two courses (6 Credit Hours), one from each other groups as in the following Table:

Group	Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category
Environment and Society	2305100	Introduction to Sociology	---	Sociology	Arts	University Elective
Economics and Public Policy	1607100	**Global political economy	---	Business Economic	Business	University Elective
Science and Technology	0305100	Environment	---	Geology	Science	University Elective

Elective Courses:

One program from the Faculty of Educational Sciences is involved, namely, Curriculum and Instruction . Six courses (18 Credit Hours) may be taken by student from his major or other majors within the group.

Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category	
0802391	Instructional Materials for Children	-----	Curriculum & Instruction	Educational Sciences	Business	University Elective
0802317	Child Computerized program	------	Curriculum & Instruction	Educational Sciences	Dept. Core	
0802414	Environmental Education child	------	Curriculum & Instruction	Educational Sciences	Dept. Core	

0802303	Designing and Producing Instructional Materials	------	Curriculum & Instruction	Educational Sciences	Dept. Core
0802213	Basic Mathematical concepts and their teaching methods (1)	------	Curriculum & Instruction	Educational Sciences	Dept. Core.
0802313	Basic Mathematical concepts and their teaching methods (2)	------	Curriculum & Instruction	Educational Sciences	Dept. Core.

Capstone Course:

This course is based on design and/or practical training for students. Depending on the student major, the following course fits as a capstone course provided the training is conducted in the field of climate change and environmental sustainability. 6 Credit Hours.

Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category
0300150	Community Service	---	Curriculum &Instruction	Educational Sciences	University Requirement

Additional Elective Courses

The following list contains courses than can be taken by student in case he/she wishes to diversify knowledge or unable to register in elective courses offered by his/her Department.

Course Code	Course Title	Prerequisite	Department	Faculty (College)	Course Category
1032464	Law of Environment	---	Public Law	Law	Dept. Elective
0515100	Principles of Public Health	---	Family and Community Medicine	Medicine	University Elective

0601100	Home Plantation	---	Plant Production	Agriculture	University Elective
0802414	Environmental Education for Children	---	Curriculum &Instruction	Educational Sciences	Dept. Elective *
1601433	Business Ethics and Social Responsibility	---	Business Administration, Business Economy	Business	Department Elective
2633100	Archaeology of Jordan	---	Archaeology	Archaeology and Tourism	University Elective
2305100	Introduction to Sociology	---	Sociology	Arts	University Elective
2305421	Globalization Issues	---	Sociology	Arts	Dept. Elective
1132100	Sports and Health	---	Health and Recreation	Physical Education	University Elective

*Not to be taken by the Educational Sciences faculty's students
**A student cannot register in a university elective course offered by the Department of his/her major.
***The student will take 8 Courses (24 hrs). Student will take 6 courses from her/his field and the other 2 courses will be the core courses. With the 6 hrs capstone course the total credit hours are 30 hrs.

Course Description

0802317 Child Computerized program (3 Cr. Hrs)

Prerequisite: (None)
This course discuss some child computerized programs (software) for the purposes of instruction, fun, and literacy. The importance of the computerized programs assisted child creative thinking and develop different skills. In addition to that children will learn some basic skills in design, production analyzing and evaluating some computerized programs and some applications on it.

0802391 Instructional Materials for Children (3 Cr. Hrs)

Prerequisite: (None)

Identifies educational materials for children their importance, sources and types, Choosing ready – made materials according to appropriate criteria and identifying their uses in the classroom. Students will learn to design needed materials which promote

children's thinking abilities such as classification, sorting, numbers, special relations, measurement, time, causality… etc. Emphasis is also placed on designing materials in ways that enhance children's total development and also to judge the efficiency of the produced learning materials.

0802414 Environmental Education child (3 Cr. Hrs)

Prerequisite: (None)

This course will include: Environmental education concept, the importance of integrating it with other subjects, ecosystems, sustaining, natural resources, environmental problem, desertification, distinction, green house effect, environmental pollution, effects of natural phenomena and environment, protecting and managing environment, and national and international safety, science, technology, society and human. Also integrated approach in designing and implementation environmental curriculum will be included.

0802303 Designing and producing Instructional Materials (3 Cr. Hrs)

Prerequisite: (None)

Introduces the concept of instructional materials; definition; relationship to instructional technology; classification; sources; role of such materials in the instructional process; the impact of perception and communication on designing different kinds of instructional materials such as transparencies, slides, audio cassettes, video tapes, and computer disks; principles of designing, producing and using instructional materials according to the system approach; practical application in designing, producing and using instructional materials in different subject matters.

0802213 Basic Mathematical concepts and their teaching methods (1)

Prerequisite: (None) (3 Cr. Hrs)

This course discusses some mathematical concepts and their methods of teaching, such as: numbers, metric system, nation and proportion, prime and composite numbers, and other geometrical concepts such as area and volume, Also this course discusses mathematical goals and objectives

0802313 Basic Mathematical concepts and their teaching methods (2)

Prerequisite: (None) (3 Cr. Hrs)

This course discusses current trends of teaching elementary mathematics with the concentrating on constructivism. Also, this course focuses in different strategies of teaching mathematical concepts, generalization, skills and problem solving. Finally, this course focuses on teaching of some geometrical concepts such as points, lines, and congruence and similarity.

Courses Syllabi

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number: 0802391

Instructional Materials for Children

University of Jordan, Faculty of Educational Sciences, Department of Curriculum and Instruction

Fall Semester, 2014/2015

Instructor Information

Instructor:	Dr. Diala Hamaidi, Assistant Professor
Office Location:	Department of Curriculum and Instruction
Telephone:	Office – :(962)-6-5355000 ext. 24591
Office Hours:	S,T,Th (10:00am-11:00am)
E-mail:	dhamaidi@nmsu.edu
Website:	http://www.ju.edu.jo/sites/academic/dHamaidi/default.aspx

Course Identification

Course Number:	0802391
Course Name:	Instructional Materials for Children
Course Location:	Department of Curriculum and Instruction
Class Times:	S,T, Th 1:00pm – 2:00pm
Prerequisites:	_
Faculty Web Page:	http://educational.ju.edu.jo/ar/arabic/Home.aspx

Course Description/Overview

Identifies educational materials for children, their importance, sources and types, Choosing ready – made materials according to appropriate criteria and identifying their uses in the classroom. Students will learn to design needed materials which promote children's thinking abilities such as classification, sorting, numbers, special relations, measurement, time, causality… etc. Emphasis is also placed on designing materials in ways that enhance children's total development and also to judge the efficiency of the produced learning materials.

Course Learning Objectives

The students will be able to:

- Identify the meaning of instructional materials for young children (Specifically, kindergarteners)
- Describe the wide variety of instructional materials that can be used in teaching young children
- Reflect on a field visit of Jordanian kindergartens' instructional materials
- Discuss the link between educational theories (Behavioral theory, Constructive theory) and choosing specific instructional materials.
- Design a thematic unit and its related instructional materials (2 sections: theoretical part and practical part)

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO1 & LO2: express their own understanding of instructional materials and search different web sites to provide examples of different instructional materials that they can use in their future teaching)

LO3: Make a presentation in front of his or her classmates in which they will respond to a guideline that was distributed to the whole class regarding a field visit for one of the Jordanian kindergartens (could be private or public). In this presentation the student will describe the physical and emotional environment with a focus on describing the existed instructional materials there. Every student will provide evidence of that visit (could be pictures, drawing, crafts, …)

LO4: Role play and present their understanding of theorists who reflect the constructive theory such as Piaget and Vygotsky, Behavioral theory (such as: Skinner). They will focus on their understanding of the implementation of each theory in the kindergarten and the relationship between the specific theorist and choosing the suitable instructional materials that reflect that theory.

LO5: Choose a specific theme based on the children developmental characteristics (the discussion in the class and the references will help them choose their favorite theme). After choosing the theme the students design a complete unit that includes a theoretical part (the idea behind choosing the theme, the long-term objectives of the unit, the short-term objectives, the activities, instructional materials that will help to achieve these objectives, and the assessment of those objectives) and a practical part (designing a variety of instructional materials that

reflect the objectives and show an evidence that their work is designed by themselves. They will provide crafts, real materials, hands-on activities,…)

Course Resources

Course Website(s)

- http://www.be.free.infor/parents/Ar/childprotocolpa.htm
- http://www.ascd.org/portal/site/ascd/menuitem.2a5fd0d2211ffffddeb3ffdb62108n
- http://www.cec.sped.org/Content/NavigationMenu/Froiessinna1Development/Frcfeusi
- onalStandards/EthicsPracriceStandards/default.htm
- http://www.aera.net
- http://www.educationsector.org/analysis/analysis_show.htm?doc.id=374565%20
- http://www.eschoolnews.org/news.org/news/showStoryts.cfm?ArticleID=6376
- http://www.edu.gov.on.ca/eng/curriculum/elementary/kindergarten.html
- http://www.children.gov.on.ca/CS/en/programs/BestStart/default.htm
- http://news.com.com/Parents-shaky+about+kids+safety+onlime/2009-1025_3610428.html

Required Course Texts and Materials

- **Instructional materials for young children (2007).**

Optional Course Texts and Materials

1. Kritchevsky, S & Prescott. E. (1990) Planning Environment for young children NAEYC. Washington D.C.
2. Lasky, L. & Mukerji, R. (1990) Art Basic for young children. NAEYC. Washington D.C.
3. Allen, R. & Hart, B. The Early ears, Arrangements for learning prentic Hall 1989.
4. Schickedan & Forsyth. Toward understanding children. Little Brown comp. 1990.
5. Day, B. Early childhood Ed. Creative Learning Activities Macmillan Pub. Com. 1988.
6. Good, R. How children learn science. MacMillan Pub. Com. 1997.

Assignments and Grading Scheme

Grading System

LO1 &LO2: Search different web sites to provide examples of different instructional materials.

LO3: Make a presentation (Rubric is attached)

LO4: Role play presentation (Rubric is attached)

LO5: Designing thematic unit with related instructional materials (Rubric is attached)

Grading System

Historical Role Play : Educational Theories (LO4)

Teacher Name: **Dr. Hamaidi**

Student Name: _____

CATEGORY	5	4	3	2
Historical Accuracy	All historical information appeared to be accurate and in chronological order.	Almost all historical information appeared to be accurate and in chronological order.	Most of the historical information was accurate and in chronological order.	Very little of the historical information was accurate and/or in chronological order.
Role	Point-of-view, arguments, and solutions proposed were consistently in character.	Point-of-view, arguments, and solutions proposed were often in character.	Point-of-view, arguments, and solutions proposed were sometimes in character.	Point-of-view, arguments, and solutions proposed were rarely in character.
Knowledge Gained	Can clearly explain several ways in which his character \"saw\" things differently than other characters and can clearly explain why.	Can clearly explain several ways in which his character \"saw\" things differently than other characters.	Can clearly explain one way in which his character \"saw\" things differently than other characters.	Cannot explain one way in which his character \"saw\" things differently than other characters.

Oral Presentation Rubric : Field Visit: Kindergarten Instructional Materials (LO3)

Teacher Name: **Diala Hamaidi**

Student Name: _____

CATEGORY	5	4	2	1

Enthusiasm	Facial expressions and body language generate a strong interest and enthusiasm about the topic in others.	Facial expressions and body language sometimes generate a strong interest and enthusiasm about the topic in others.	Facial expressions and body language are used to try to generate enthusiasm, but seem somewhat faked.	Very little use of facial expressions or body language. Did not generate much interest in topic being presented.
Stays on Topic	Stays on topic all (100%) of the time.	Stays on topic most (99-90%) of the time.	Stays on topic some (89%-75%) of the time.	It was hard to tell what the topic was.
Content	Shows a full understanding of the topic.	Shows a good understanding of the topic.	Shows a good understanding of parts of the topic.	Does not seem to understand the topic very well.
Time-Limit	Presentation is 5-6 minutes long.	Presentation is 4 minutes long.	Presentation is 3 minutes long.	Presentation is less than 3 minutes OR more than 6 minutes.

LO1 &LO2 Class discussion of students' search.

Final Project Presentation: LO5

CATEGORY	**25-21**	**20-16**	**15-11**	**10-0**

Resources / Assessment - 30%	Theme is clear and appropriate to the grade level. Goes along with the Mass. Curriculum Framework.	Theme is clear but not quite appropriate to the grade level. Goes along with the Mass. Curriculum Framework.	Theme is clear but not appropriate to the grade level. Does not go along with the Mass. Curriculum Framework.	Theme is not clear and not appropriate to the grade level. Does not go along with the Mass. Curriculum Framework.
Integrated Study - 20%	The unit includes other disciplines integrated into the lessons with a focus on science and math.	The unit only shows some integration but focuses mostly on math and science.	The unit includes very little materials and resources.	The unit does not contain any materials used or maybe only a short list of them.
Resources / Assessment - 20%	Covers topic in-depth with details and examples. Subject knowledge is excellent.	Includes essential knowledge about the topic. Subject knowledge appears to be good.	Includes essential information about the topic but there are 1-2 factual errors.	Content is minimal OR there are several factual errors.
Mechanics / Organization - 10%	Project is submitted in a plastic file box which includes a binder of lessons as well as materials to support lesson. It will	Project submitted in file box and is mostly well organized. It includes lessons and supporting material. It is computer generated.	Project lacks organization and is missing materials. May not be submitted in correct format. Some things may not be typed.	Project has no organization and is not submitted in the correct format. The project may be missing materials / excessive errors.
Oral Presentation - 20%	Interesting, well-rehearsed with smooth delivery that holds audience attention.	Relatively interesting, rehearsed with a fairly smooth delivery that usually holds audience attention.	Delivery not smooth, but able to hold audience attention most of the time.	Delivery not smooth and audience attention lost.

Grading Policy

Grades can be based on the following: (Example)

Assignments	20%
Exams (1 midterm +1 Final)	70%
Class attendance/Activity participation	10%
Total Points	100

Course Policies

Late Assignments

If you pass the due date your final grade of the assignment will be affected. 5% will be deducted from the late assignment.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class.

Dissability

Appropriate accommodations will be provided for students who have self-identified in the office of Services for Students with Disabilities. If you have, or believe you have a disability, you may wish to self-identify.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	14/9/2014	• Instructor and Students [Presentation: Know each other] • Schedule & Syllabus Review [Lecture] ▪ Next Class [Announcements] 21/9 ▪ Search online websites: meaning of instructional materials for young children
2	21/9	Instructional materials resourses
3	28/9	Designing instructional materials, Ways and methods of utilizing instructional materials: aproaches to ESD
4	12/10	Class discussion of students' search Chapter1: Textbook (Examples of Instructional Materials) Group discussion – Whole class discussion Ch.2: Textbooks: Criteria of choosing Instructional materials
5	19/10	Benefits of Instructional materials: Discussion of the following article from: Cone of Experience / Edgar Dale http://www.khayma.com/education-technology/w5.htm http://www.bhteachersbh.com/forum/new.php?print=1&id=2791 Kritchevsky, S & Prescott. E. (1990) Planning Environment for young children NAEYC. Washington D.C. Presentations of Field Visit Assignment Presentation continue …

6	26/10	presentation continue to build a solid foundation of what is existed in the Jordanian kindergartens
7	2/11	Ch.4: Educational Theories: PowerPoint Presentation: Whole Class discussion regarding each theory and its implementations on choosing instructional materials Skinner, Piaget, Vygotsky, Pruner, Ausubel, Bloom Taxonomy http://www.4uarab.com/vb/showthread.php?t=55885 *faculty.ksu.edu.sa/74637/441/نظريات%20التعلم.doc* http://educationaden.50webs.com/Ausubel.pdf *faculty.ksu.edu.sa/ualturki/Documents/نظريات%20التعلم1.ppt* *Other related links*
8	9/11	Educational Theories: Role Play Presentations Group Presentation *Historical Role Play : Educational Theories (LO4)*
9	16/11	Implementations of Educational Theories in classrooms Introduction: Designing Thematic Unit (Instructor presentation of previous examples)
10	23/11	Midterm Exam: 25/03/2012 Search: Kindergarteners' Developmental Characteristics Students' Search
11	30/11	Designing Thematic Unit (Instructor presentation of previous examples)
12	7/12	How to design the theoretical part of the thematic units

		Review Jordanian Kindergarten curriculum Interactive Kindergarten Curriculum
13	14/12	Designing the practical part of the thematic units How to design hands-on activities and experiences that cover the following domains: Knowledgeable aspect (cover all content areas that are introduced in KG Curriculum and match the developmental aspects of kindergarteners) Social and emotional aspect Physical aspect
14-16	21-28/12	Final Project presentations

Course Syllabus

0802303 Designing and Producing Instructional Materials

The University of Jordan

Faculty of Educational Sciences

Department of Curriculum & Instruction

Instructor Information

Instructor: Dr. Suhair Jaradat
Office Location: 2nd floor, Faculty of Educational Sciences Building
Telephone: 5355000 – 24590
Office Hours: Sun, Tues, Thurs 10-11
E-mail: s.jaradat@ju.edu.jo

Course Identification

Course Number: 0802303
Course Name: Designing and Producing Instructional Materials
Course Location: room 102, Faculty of Educational Sciences Building
Class Times: Sun, Tues, Thurs 11-12
Prerequisites: NA
Faculty Web Page: http://educational.ju.edu.jo/Home.aspx

Course Description/Overview

Designing and Producing Instructional Materials (3 Cr. Hrs)

Introduces the concept of instructional materials; definition; relationship to instructional technology; classification; sources; role of such materials in the instructional process; the impact of perception and communication on designing different kinds of instructional materials such as transparencies, slides, audio cassettes, video tapes, and computer disks; principles of designing, producing and using instructional materials according to the system approach; practical application in designing, producing and using instructional materials in different subject matters.

Course Learning Objectives

Students will be taught the following:

1. Identify instructional materials and their role in the teaching learning process.
2. Understand the relationship between instructional materials and instructional technology.
3. Introduced to the available instructional materials and equipments.
4. How to use the available instructional equipments.
5. Identify the basics of designing and producing instructional materials.
6. Learn the criteria used to evaluate the instructional materials.
7. Learn how to design and produce instructional materials.
8. Learn how to use instructional materials
9. Gain positive attitudes towards using instructional materials in the classroom.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Identify the concepts related to instructional materials.

2. Recognize the relationship between instructional materials and other concepts such as instructional technology, educational technology, perception, and communication.
3. Evaluate instructional materials.
4. Select the appropriate instructional materials for different subjects.
5. Use the available educational equipment.
6. Design and produce instructional materials for different subjects.
7. Design and produce involving the learners' senses.
8. Choose computerized instructional software as ready instructional material.
9. Apply the criteria of evaluating instructional materials during the design and production process.
10. Demonstrate their ability to use instructional materials in real teaching learning situation.

Course Resources

Web sites that might be helpful

- http://alzaheer.wordpress.com/category/%D8%A7%D9%81%D9%83%D8%A7%D8%B1-%D9%88%D8%B3%D8%A7%D8%A6%D9%84-%D8%AA%D8%B9%D9%84%D9%8A%D9%85%D9%8A%D8%A9/
- http://www.google.jo/search?q=%D8%AA%D8%B5%D9%85%D9%8A%D9%85+%D9%88%D8%B3%D8%A7%D8%A6%D9%84+%D8%AA%D8%B9%D9%84%D9%8A%D9%85%D9%8A%D8%A9&hl=ar&rlz=1R2RNQN_enJO460&prmd=imvns&tbm=isch&tbo=u&source=univ&sa=X&ei=uDs5T4n8E8bn8QPp3PitAg&ved=0CE8QsAQ&biw=1024&bih=540

Required Course Texts and Materials

- أحمد سالم (2004). تكنولوجيا التعليم والتعليم الالكتروني. الرياض، مكتبة الرشد.

- مصطفى عبد السميع محمد وآخرون (2004). تكنولوجيا التعليم مفاهيم وتطبيقات. عمان، دار الفكر.

Optional Course Texts and Materials

1. محمد محمود الحيلة (2007). تصميم وإنتاج الوسائل التعليمية. دار المسيرة، عمان.
2. محمد محمود الحيلة (2007). تكنولوجيا التعليم بين النظرية والتطبيق. دار المسيرة، عمان.
3. عبد الله الموسى وأحمد المبارك (2005). التعليم الإلكتروني – الأسس والتطبيقات. الرياض، مؤسسة شبكة البيانات.
4. حسن علي بني دومي وعمر حسين العمري (2007). أساسيات في تصميم وإنتاج الوسائل التعليمية.
5. كمال زيتون (2004). تكنولوجيا التعليم في عصر المعلومات والاتصالات. القاهرة، عالم الكتب.
6. أحمد سالم وعادل سرايا (2003). منظومة تكنولوجيا التعليم مفاهيم وتطبيقات. عمان، دار الفكر.
7. بشير عبد الرحيم الكلوب، التكنولوجيا في عملية التعلم والتعليم، دار الشروق، عمان، 1999.
8. بشير عبد الرحيم الكلوب – استخدام الأجهزة في عملية التعلم والتعليم
9. سلامه ، عبد الحافظ ، 1996 وسائل الاتصال والتكنولوجيا في التعليم ، دار الفكر
10. Beginning Radio and TV Newswriting: A Self-Instructional Learning Experience by K. Tim Wulfemeyer (May 26, 2009)
11. Enhancing Teaching and Learning: A Leadership Guide for School Library Media Specialists, Second Edition Revised by Jean Donham (July 18, 2008)

Assignments and Grading Scheme

(Insert the course assignments here, and indicate how each assignment is aligning with the learning outcomes).

1. In this course you are required to visit any elementary school you choose around campus or in your neighborhood and observe one of the classes in which the teacher is using instructional materials (grades 1-3), so you can get an idea on using instructional materials in a real situation. You need to write a short report 1-2 pages, you will be provided with questions to answer through

your observation or to ask the teacher after class, one week before the time of the visit. You will be given an official letter from the college of education asking the school administration to allow you in the class.

2. For the final project you will be asked to design and produce instructional materials for any subject you choose for grades 1-3. Through this project you need to apply all what you have learned in the class, and to demonstrate your ability to use the materials you have produced in a real teaching-learning situation.

Grading Policy

Grades will be based on the following:

Mid Term Exam	20%
Field observation	5%
Class attendance/participation	5%
Project (design & Produce instructional materials in class)	20%
Final Exam	50%
Total Points	**100**

Course Policies

Late Assignments

Late assignments will be loosing 2 points for the 1st day after the deadline, and will no be considered after that.

Classroom Protocol

All students in this class are expected to:

1. Participate in class discussions.
2. Attend classes regularly, if you miss more than 7 classes you will not be allowed to attend the final exam.

3. Arrive to the class on time.
4. Turn off cell phones in the class.

Dissability

If you are a student with special needs, please talk to the instructor at the beginning of the semester.

Important Dates to Remember

Mid-term exam Nov 5, 2014
Final exam is based on official announcement by the university.

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines
1	14/9/2014	Introduction to the course, Syllabus
2	21/9	The concept of instructional materials, instructional technology, teaching &learning. Instructional materials and the systemic approach. Scientific approach. Historical overview
3	28/9	The role of instructional materials in facilitating the teaching-learning process Criteria for a good instructional material

		Rules to be followed when using instructional materials
	5/10	Holidays
4	12/10	Philosophical perspectives Classifications of instructional materials
5	19/10	Evaluating instructional materials Perception and instructional materials, principles, factors
6	26/10	Educational communication Historical overview, goals, models
7	2/11	Communication: criteria, barriers General features in designing and producing instructional materials For whom, how, when, why, where
8	9/11	Learning principles and psychological perspective Instructional design : concepts, steps(different models) Planning for producing instructional materials Steps to follow
9	16/11	Instructional equipments available: demonstrations Midterm exam
10	23/11	Computerized instructional materials
11	30/11	Exploring, evaluating samples of instructional materials in the lab Classroom observation
12	7/12	Divide in groups Planning for designing and producing instructional materials: goals, target group, materials to be used, description, how to be used
13	14/12	Start production

14	21/12	Continue production
15	28/12	Class presentations
16	4/1	Final exam

Course Syllabus

Course Name and Number:

Basic Mathematical concepts and their teaching methods (1)

0832213

The University of Jordan, Faculty of Educational Sciences, Department of Curriculum and Instruction

Instructor Information

Instructor: Dr.Hala Alshawa

Office Location: Faculty of Educational Sciences Building, Second Floor, Department of Curriculum and Instruction.

Telephone: Office – 24476

Office Hours: Day(s) time: 10-11 Sunday, Tuesday, and Thursday
11-12 Monday and Wednesday

E-mail: hala.alshawa@ju.edu.jo or halshawa3@yahoo.com
Website: http://www.ju.edu.jo/sites/academic/halshawa/default.aspx

Course Identification

Course Number: 0832213

Course Name: *Basic Mathematical concepts and their teaching methods (1)*

Course Location: Room 102, Faculty of Educational Sciences Building
Class Times: Sunday, Tuesday, Thursday 9-10
Prerequisites: -
Faculty Web Page: http://Educationalsciences.ju.edu.jo

Course Description

This course displays basic mathematical concepts and its teaching methods and strategies such as: numbers and its computational operations, base ten system, place values, fractions, decimals and its computational operations, rounding with respect to place value, percentage, powers and operations, prime factorization, proportion and ratio, integers, metric measure, linear measure, and time. Furthermore, this course addresses the objectives and the teaching methods and strategies for the first three grades.

Course Learning Objectives

1. Identify the nature of mathematics.
2. Identify the learning objectives of teaching mathematics for the first three grades.
3. Identify the effective /modern strategy for teaching mathematical concepts/generalization\skills\and problem solving for the first thee grades.
4. Understand geometric concepts \theories related to the first thee grades.
5. Learn how to analyze, connect, develop, mathematical concepts.
6. Learn about NCTM

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Implement different effective /modern strategy for teaching mathematical concepts/generalization\skills\and problem solving for the first thee grades.
2. Solve mathematical problems using concepts /theories in more than one method.

3. Explain mathematical concepts using different teaching strategies
4. Use high level skills such as analysis, prediction, connection, representation,… in teaching mathematics for the first thee grades.
5. Analyze a unit from math textbook (1st three grades) with respect to concepts/generalization/skills/problem solving.
6. Analyze a unit from math textbook (1st three grades) with respect to the NCTM content and operation standards.

Course Resources

Course Website(s)

- List any other web sites to be used
    1. http://www.homeschoolmath.net/online/geometry.php
    2. http://www.teachrkids.com/
    3. http://www.almakan.net/vb/showthread.php?p=278168
    4. http://www.instructorweb.com/lesson/geometryshapes.asp

Course Texts and Materials

* -أبو زينة، فريد، عبابنة، عبداللة. (2011). مناهج الرياضيات للصفوف الأولى. دار المسيرة للنشر والتوزيع والطباعة,عمان,الأردن.

-عباس,محمد ومحمد العبسي (2011)مناهج وأساليب تدريس الرياضيات للمرحلة الأساسية الدنيا,دار المسيرة للنشر والتوزيع والطباعة,عمان,الأردن.
-عقلان, إبراهيم (2012) مناهج الرياضيات وأساليب تدريسها.
-خليل، يوسف.(2012). الهندسة ,أساليب تدريسها. دار المسيرة للنشر والتوزيع والطباعة,عمان,الأردن.
.
- عبيد ، وليم (2012). تعليم الرياضيات لجميع الأطفال . دار المسيرة: للنشر والتوزيع: عمان.

1. Musser, G. J Burger (2011). Mathematics for elementary teachers: A contemporary approach Macmillan publishing Company. New York.

2. Musser, G.J Burger, W.(2010). Student resource handbook: Mathematics for elementary teachers. Macmillan Publishing Company: New York.

3. Hatfield, M., Edwards, N. & Bitter, G. (2009) Mathematics methods for the elementary and middle school. Needham Heights, MA: Allayn & Bacon.

4. Moore, K. (2010). Classroom teaching skills. Mc Grow-Hill, Inc: London.

Grading Policy

Grades can be based on the following:

Assignments(projects, practicum, presentation, field visits)	25%
Participation	5%
Mid-term Exam	20%
Final Exam	50%
Total Points	**100**

Course Policies

Late Assignments

Any late assignment without an official permission will not be considered.

Classroom Protocol

Students are expected to attend every class at the beginning of the session, unless you have an excused absence due to illness or an emergency. According to the university regulations, if you miss more than 15% of 48 hours during the term, you will fail the course.

Dissability

Any student with special needs should contact me and provide official documents at the beginning of the semester.

Important Dates to Remember

Mid-term exam April 2, 2015

Final Exam is based on the official announcement by the university

Course Schedule

Week	Topics
1,2	Introduction to the course Math curriculum for the 1st three grades
3,4	Analyzing the Jordanian math curriculum for the 1st three grades Comparing Jordanian Math textbooks with other Arab Math textbooks
5,6	Set theory
7	Counting models
8	Whole number basic mathematical operations, and its properties
9	Students' presentations Mid-term test
10	Integers , basic mathematical operations, and its properties
11	Fractions, basic mathematical operations, and its properties
12	Real numbers, , basic mathematical operations, and its properties
13	Prime factorization

14	Percentage and ratio
15	Problem solving
16	Review and the Final Exam

Course Syllabus

Course Name and Number:

Basic Mathematical concepts and their teaching methods (2) 0802313

The University of Jordan, Faculty of Educational Sciences, Department of Curriculum and Instruction

Instructor information

Instructor: Dr.Hala Alshawa
Office Location: Faculty of Educational Sciences Building, Second Floor, Department of Curriculum and Instruction.
Telephone: Office – 24476
Office Hours: Day(s) time: 11-12 Sunday, Tuesday, and Thursday
11-12 Monday and Wednesday
E-mail: hala.alshawa@ju.edu.jo or halshawa3@yahoo.com
Website: http://www.ju.edu.jo/sites/academic/halshawa/default.aspx

Course Identification

Course Number: 0802313
Course Name: *Basic Mathematical concepts and their teaching methods (2)*

Course Location: Room 102, Faculty of Educational Sciences Building
Class Times: Sunday, Tuesday, Thursday 9-10
Prerequisites: -
Faculty Web Page: http://Educationalsciences.ju.edu.jo

Course Description

This course discusses current trends of teaching elementary mathematics with the concentrating on constructivism. Also, this course focuses in different strategies of teaching geometric concepts, generalization, skills and problem solving. Finally, this course focuses on teaching of some geometrical concepts such as points, lines, congruence and similarity, perimeter, area, volume.

Course Learning Objectives

7. Identify the nature of mathematics.
8. Identify the learning objectives of teaching geometric for the first three grades.
9. Identify the effective /modern strategy for teaching geometric concepts/generalization\skills\and problem solving for the first thee grades.
10. Understand geometric concepts \theories related to the first thee grades.
11. Learn how to analyze, connect, develop, geometric concepts.
12. Learn about NCTM

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

7. Implement different effective /modern strategy for teaching geometric concepts/generalization\skills\and problem solving for the first thee grades.
8. Solve geometric problems using concepts /theories in more than one method.
9. Explain geometric concepts using different teaching strategies
10. Use high level skills such as analysis, prediction, connection, representation,… in teaching geometric for the first thee grades.

Course Resources

Course Website(s)

- List any other web sites to be used
    5. http://www.homeschoolmath.net/online/geometry.php
    6. http://www.teachrkids.com/
    7. http://www.almakan.net/vb/showthread.php?p=278168
    8. http://www.instructorweb.com/lesson/geometryshapes.asp

Course Texts and Materials

* -أبو زينة، فريد، عبابنة، عبداللة. (2011). مناهج الرياضيات للصفوف الأولى. دار المسيرة للنشر والتوزيع والطباعة,عمان,الأردن.
-عباس,محمد ومحمد العبسي (2011)مناهج وأساليب تدريس الرياضيات للمرحلة الأساسية الدنيا,دار المسيرة للنشر والتوزيع والطباعة,عمان,الأردن.
-عقلان, إبراهيم (2012) مناهج الرياضيات وأساليب تدريسها.
-خليل، يوسف.(2012). الهندسة ,أساليب تدريسها. دار المسيرة للنشر والتوزيع والطباعة,عمان,الأردن.
.
- عبيد ، وليم (2012). تعليم الرياضيات لجميع الأطفال . دار المسيرة: للنشر والتوزيع: عمان.

5. Musser, G. J Burger (2011). Mathematics for elementary teachers: A contemporary approach Macmillan publishing Company. New York.

6. Musser, G.J Burger, W.(2010). Student resource handbook: Mathematics for elementary teachers. Macmillan Publishing Company: New York.

7. Hatfield, M., Edwards, N. & Bitter, G. (2009) Mathematics methods for the elementary and middle school. Needham Heights, MA: Allayn & Bacon.

8. Moore, K. (2010). Classroom teaching skills. Mc Grow-Hill, Inc: London.

Grading Policy

Grades can be based on the following:

Assignments(projects, practicum, presentation, field visits)	25%
Participation	5%
Mid-term Exam	20%
Final Exam	50%
Total Points	**100**

Course Policies

Late Assignments

Any late assignment without an official permission will not be considered.

Classroom Protocol

Students are expected to attend every class at the beginning of the session, unless you have an excused absence due to illness or an emergency. According to the university regulations, if you miss more than 15% of 48 hours during the term, you will fail the course.

Dissability

Any student with special needs should contact me and provide official documents at the beginning of the semester.

Important Dates to Remember

Mid-term exam April 2, 2015

Final Exam is based on the official announcement by the university

Course Schedule

Week	Topics
1,2	Introduction to the course Lines and angels
3,4	Measurements
5	Time
6	2D shapes and its properties
7	3D shapes and its properties
8	Perimeter
9 &10	Students' presentations Mid-term test
11	Area
12	Volume
13	Cartesian Representation
14	NCTM Standards and Principles
15	Problem Solving
16	Review and the Final Exam

الجامعة الأردنية
كلية العلوم التربوية
قسم المناهج و التدريس

نموذج وصف مادة

اسم المادة ورقمها **برامج الأطفال المحوسبة** **(0802317)**	اسم المحاضر: د. سهير جرادات E-mail: s.jaradat@ju.edu.jo Tel: 5355000 Ext. 24590
عدد الساعات المعتمدة: 3	
عدد الأسابيع: 16	

وصف المادة:

تتناول هذه المادة البرامج التعليمية والترفيهية والتثقيفية وأهميتها للأطفال وأثرها في نمو مهاراتهم المختلفة والاستراتيجيات المختلفة لتوظيف هذه البرامج لأغراض تعليمية ومعايير تقويمها ، وأسس تصميم وإنتاج وتحليل البرامج التعليمية وتطبيقات عملية.

الأهداف:

تهدف هذه المادة إلى:

1. تعريف الطالب بدور الحاسوب وأهميته كوسيلة تعليمية وترفيهية وتثقيفية للأطفال.
2. إكساب الطالب بعض الكفايات التكنولوجية المتعلقة بموضوع المادة.
3. التعرف على بعض المعايير التي يمكن إتباعها في اختيار وتقويم برمجيات حاسوبية جاهزة مناسبة للأطفال.
4. إكساب الطالب مهارات تطبيقية لبرمجيات حاسوبية جاهزة تناسب الأطفال في أعمار مختلفة وكيفية استخدامها في تعليمهم.
5. إكساب الطالب مهارة تصميم أنشطة والعاب تعليمية محوسبة للأطفال.

مخرجات التعلم:

1. يدرك الطالب المفاهيم المتعلقة بالثقافة الحاسوبية.
2. يميز الطالب دورا لحاسوب وأهميته كوسيلة تعليمية وترفيهية وتثقيفية للأطفال.
3. يقدر الطالب المخاطر الصحية والنفسية والاجتماعية والعقلية للحاسوب.
4. يدرك الطالب مفاهيم متعلقة بكيفية استخدام الحاسوب كوسيلة تعليمية وترفيهية مساعدة للأطفال.
5. استخدام الانترنت كمصدر وأداة بحث عن مواقع وبرمجيات جاهزة ومجانية مناسبة للأطفال.
6. استخدام برمجيات مختلفة ولأغراض مختلفة للأطفال.
7. يستخدم الطالب الحاسوب في تطبيق العاب تعليمية وترفيهية وتثقيفية.
8. يختار البرمجية التعليمية الجاهزة والمناسبة للمرحلة العمرية والاحتياجات المختلفة للأطفال.

9. يصمم أنشطة و العاب تعليمية في موضوعات مختلفة للأطفال.
10. يقيم البرامج والألعاب والمواقع التعليمية المختلفة للأطفال.
11. يوظف الطالب ما تعلمه وصممه من أنشطة وألعاب تعليمية محوسبة في غرفة الصف.

التقويم:

1. امتحان منتصف الفصل 20%
2. أعمال الفصل 30%
3. الامتحان النهائي (نظري + عملي) 50%

يتوقع من الطالب الالتزام بمواعيد تسليم الواجبات التي يحددها المدرس. كما ويتوقع من الطالب الالتزام بحضور المحاضرات ووقتها و مواعيد الامتحانات، والتقيد بمضمون أنظمة وتعليمات الجامعة.

طرائق التدريس:

1. المحاضرة
2. المناقشة والحوار.
3. تطبيقات عملية في مواضيع مختلفة باستخدام الحاسوب.
4. البحث والاستقصاء
5. تعلم تعاوني
6. التعلم من خلال المشروع والمهام العملية

الخطــة:

الأسبوع	الموضوع	ملاحظات
	الفصل الأول: أهمية استخدام الحاسوب لطفل الروضة	

2+1	1. مبادئ تقديم الخبرات المحوسبة للأطفال 2. مبادئ تصميم عناصر عملية التعليم باستخدام البرامج التعليمية المحوسبة للأطفال 3. مخاطر استخدام الحاسوب وإرشادات وقائية 4. كفايات مهنية و تكنولوجية لدى المعلم	
3	**الفصل الثاني: المرحلة العمرية للطفل(خصائصها وحاجاتها للبرامج المحوسبة** 1. النمو الجسمي والحركي للطفل 2. النمو الانفعالي للطفل 3. النمو الاجتماعي للطفل 4. النمو اللغوي للطفل 5. النمو العقلي للطفل	
4	**الفصل الثالث: استعدادات الأطفال وتقويمها** 1. استعدادات(قدرات) حسية: سمعية – بصرية... 2. استعدادات(استجابات) حركية: دقة التحكم- زمن الرجع- مهارة الإصبع 3. استعدادات اجتماعية: ذكاء اجتماعي- مهارات اجتماعية 4. استعدادات أكاديمية: علمي-لغوي- رياضياتي 5. استعدادات مهنية: موسيقية- فنية – تكنولوجية	
5	**الفصل الرابع: تصنيفات برامج الأطفال المحوسبة** 1. ترفيهية: رياضية- خيالية- عنف واقعي- عنف خيالي- معمارية بنائية- إستراتيجية 2.تثقيفية: اثرائية- موجهة بيئيا- رسم وتلوين- قصص وكتب الكترونية- العاب	

	تفكير 3. تعليمية: تدريب وممارسة- تدريس خصوصي- حوار وتخاطب- حل المشكلات- محاكاة- العاب تعليمية 4. تصنيف البرامج وفق نظريات التعلم : السلوكية- البنائية	
6	**الفصل الخامس: معايير لتقويم لبرامج الأطفال المحوسبة** 1. معايير تربوية < الأسس النفسية والفلسفية- أهداف البرنامج- محتوى البرنامج> 2. معايير فنية < تشغيل البرنامج- المساعد- واجهة الاستخدام- التصميم العام – تقويم البرنامج> 3. إرشادات توظيف البرنامج < مبادئ تقديم الخبرات المحوسبة- أسس تصميم وإنتاج البرامج المحوسبة> 4. خطوات بناء البرامج المحوسبة للأطفال <مرحلة الدراسة والتحليل- مرحلة تصميم السيناريو-مرحلة الإنتاج>	
7+8+9	**تطبيقات عملية باستخدام البرمجيات التعليمية الجاهزة الآتية:** برمجية تعلم الحروف العربية مع النطق برمجية صور تعليمية للأطفال برمجية لغة انجليزية للمرحلة الأساسية برمجية تعليم الرياضيات برمجية تعلم بعض العبادات للأطفال	يتضمن استخدام و تقييم وتوظيف للمواقع والبرمجيات المذكورة
10	برمجية MS-Logo	يتضمن عرض ومناقشة أعمال الطلبة للواجب

11+12	برمجية Classtools	المطلوب (تصميم أنشطة وألعاب تعليمية) لكل من البرمجيات المذكورة
13+14	برمجية kidspiration	
15+16	برمجية Windows Movie Maker	
	المراجع : - blackboard.ju.edu.jo رقم المستخدم: (0802317_std) - مرزوق، سماح عبد الفتاح(2010). برامج الأطفال المحوسبة، دار المسيرة، عمان- الأردن - محمد، مصطفى عبدالسميع وآخرون (2009). برامج الأطفال المحوسبة، دار الفكر، عمان- الأردن - الرجوع إلى شبكة المعلومات الدولية (Internet) بشكل مستمر والبحث عن مواقع والعاب تعليمية مناسبة للأطفال. - الزعبي، محمد بلال وآخرون. 2005 الحاسوب والبرمجيات الجاهزة ، دار وائل للنشر والتوزيع ،الطبعة السابعة عمان – الأردن .	

	مواقع تعليمية الكترونية: http://kids.jo/main http://hissabe.com/ http://www.schoolarabia.net/index1.htm http://kids.islamweb.net/ http://www.scholastic.com/magicschoolbus/games/home.htm http://www.starfall.com/ http://www.harfkids.com/ http://pbskids.org/ http://www.arabian-child.net/ http://www.viti4kids.gov.eg/ http://www.ixl.com/ http://www.askkids.com/	

	http://www.3f3.com/ http://www.al-fateh.net/ http://www.a7bti.com/ www.bezra.com.eg http://www.kidsknowit.com/ www.kidsclick.com www.rainbow-soft.com **بالإضافة إلى ما هو موجود على موقع المادة من خلال EdModo برمجية**	

بسم الله الرحمن الرحيم

الجامعة الأردنية — كلية العلوم التربوية

قسم المناهج والتدريس

اسم المادة ورقمها الفصل الأول 2015/2014	التربية البيئية للطفل 0842414	مدرس المادة: د. ديالا حميدي
عدد الأسابيع	16	المتطلبات السابقة: لا يوجد

وصف المساق

يتناول هذا المساق مفهوم التربية البيئية وأهمية التكامل في عرضها ضمن الموضوعات الممكنة، النظام البيئي، المصادر الطبيعية والمحافظة عليها، المشكلات البيئية والتصحر، والانقراض، ظاهرة البيت الزجاجي، تلوث البيئة، الظواهر الطبيعية وأثرها في البيئة، إدارة البيئة وحمايتها، صحة البيئة، البيئة والأمن الوطني والقومي، وقضايا العلم والتكنولوجيا والبيئة والإنسان. وتعرف المنحى التكاملي في تصميم منهاج التربية البيئية وتنفيذه.

محتويات المساق

الوحدة	المحتويات

الوحدة	المحتويات
الوحدة الأولى : التربية البيئية: المفهوم– الأهداف – المعوقات– الضوابط	– تعريف البيئة – التربية البيئية و أهدافها – النظام البيئي الطبيعي والحضاري – النظام البيئي ومكوناته – دورات المواد وأنواعه – اختلال التوازن البيئي ومسبباته – الإنسان وتغيير النظم البيئي – الضوابط اللازمة لتحقيق أهداف التربية البيئية – أنشطة تثقيفية و إثرائية –
الوحدة الثانية : أهم التحديات الأساسية التي تؤثر في العمل البيئي في الوطن العربي	– السكان – محدودية بعض الموارد البيئية وإهدار الكثير منها – آثار التغيرات العالمية على البيئة العربية - أنشطة تثقيفية
الوحدة الثالثة :	– النزاعات والحروب وتأثيرها على البيئة والتنمية المستدامة في الوطن

الوحدة	المحتويات
أهم المشكلات البيئية على المستوى العالمي والعربي	العربي – العولمة والحكم الرشيد، وتأثيرهما على البيئة في الوطن العربي – إدارة البيئة وحمايتها – تلوث الهواء وتغير المناخ وأثرهما على المستوى العالمي والعربي – البيئة الساحلية في الوطن العربي – نقص التنوع الحيوي في الوطن العربي – الزحف الصحراوي في الوطن العربي – أنماط الإنتاج والاستهلاك غير المستدام – المخلفات الصلبة والنفايات الخطرة والملوثات العضوية الثابتة – الطاقة واستخداماتها في الوطن العربي – الكوارث البيئية - البيت الزجاجي – صحة البيئة – **المشكلات البيئية في الأردن ودور التربية البيئية في مواجهتها**
الوحدة الرابعة : وسائل التغلب والتخفيف من حدة المشكلات البيئية	– المؤتمرات الدولية والإقليمية ودعوتها إلى التنمية المستدامة – التشريعات والقوانين البيئية – الإعلام البيئي

الوحدة	المحتويات
	- أنشطة تثقيفية
الوحدة الخامسة ممارسات بيئية إيجابية وعملية	– بعض الممارسات العملية للحفاظ على البيئة – الحقوق والواجبات البيئية - صحة البيئة
الوحدة السادسة : قضايا العلم والتكنولوجيا والبيئة والإنسان **تعليم التربية البيئية**	- قضايا العلم والتكنولوجيا والبيئة والإنسان. - أهم أساليب تربية طفل ما قبل المدرسة بيئيا - تقويم التربية البيئية

متطلبات المساق :

- **حضور جميع المحاضرات والمساهمة الفاعلة فيها .**
- **امتحان أول 20 %**
- **المشاركة والأنشطة العملية في الميدان 30%**
- **امتحان نهائي 50 %**

المجموع 100 %

المصادر:

- القرآن الكريم.

- مسند الإمام أحمد: مكتبة فيصل عيسى البابى – القاهرة – د.ت.
- صحيح البخاري بحاشية السندي، مكتبة فيصل عيسى البابي الحلبي، القاهرة د.ت.

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http://facebook.com/be2tna.mas2olytna

Prepared by Dr. Hala Alshawa
Following Dr. AbuYaghi's Form

halshawa3@yahoo.com

September, 29th , 2014

Course	**International Trade Theory**
Module 1	**Introduction to International Economics and Overview of World Trade.**
Key Concepts	International trade, international money, acceleration of the size of world trade.
Overview	The study of international economics has become very important in recent decades, and the international economics relations have b crucial to every country. Significant themes are considered in this subject including the gains from trade, the patterns of protectionism and international capital markets. The size of trade flows of goods and services and capital has accelerated during t few decades, as appears in the rise in the ratio of this trade to GDP. This aspect has been driven by several factors such as the coop

	on international trade policies.
Aim	To create the awareness of the importance of international trade itself, and the importance of studying it. Also, to introduce stud international economic concepts and issues.
Learning Outcomes	At the end of this module learner will be able to : • Distinguish between international and domestic issues. • Distinguish between the trade and monetary aspects of international economics. • Understand the causes of trade, patterns of trade and terms of trade. • Acquire data on the development of exports trade and imports at the global level, as well as domestic one.
Units	Chapter 1: Introduction Chapter 2: World Trade : An overview.
Readings	• Paul Bairoch. Economics and World History, London : Harvester, 1993 A grand survey of the world economy over time. • World Bank. World Development Report of 1995.
Activity	1- Calculate the ratio of (exports of goods and services) to GDP for each of the Arab Asian countries for years 2000 and 2013. Compare results and provide your comments. 2- Compare the export rankings of the top ten leading exports of 1994 to the rankings top ten leading exports in 2013. Discuss some of t reasons why rankings have changed. 3- A century ago, most British imports came from relatively distant locations: North America, Latin America, and Asia. Today, most Br imports come from other European countries. How does this fit in with the changing types ofgoods that make up world trade?
Module 2	Labor Productivity and Comparative Advantage: The Ricardian Model.
Key Concepts	Absolute advantage, comparative advantage, opportunity cost, partial equilibrium analysis, unit labor requirement, production possi frontier, dynamic comparative advantage and ethics.
Overview	The Ricardian model is the simplest model that shows how differences between countries in labor productivity give rise to trade and from trade. In this model, countries will export goods that their labor produces relatively efficiently and import goods that their labo produces relatively inefficiently. A country's production pattern is determined by comparative advantage. The proposition that trade beneficial is unqualified. That is, there is no requirement that a country be "competitive" or that the trade be fair.
Aim	Introducing students to the concept of comparative advantage and develop a specific model of how comparative advantage determi pattern of international trade.

<table>
<tr><td>Learning Outcomes</td><td>After reading this module, the student will be able to:
Explain how the Ricardian model works and how it illustrates the principle of comparative advantage.
Demonstrate gains from trade and refute common fallacies about international trade.
Describe the empirical evidence that wages reflect productivity and that trade patterns reflect relative productivity.</td></tr>
<tr><td>Units</td><td>Chapter 3</td></tr>
<tr><td>Readings</td><td>- Rudiger Dornbusch, Stanley Fischer and Paul Samuelson. "Comparative Advantage, Trade and Payments in Ricardian Model with a Continuum of Goals." American Economic Review 67 (December 1977),pp. 823-83.
- David Ricardo. The Principles of Political Economy and Taxation. Homewood; IL. : Irwin, 1963.</td></tr>
<tr><td>Activity</td><td>1. Given the input-output relationships in the table below:
<table>
<tr><td rowspan="2">goods</td><td colspan="2">countries</td></tr>
<tr><td>Jordan</td><td>Lebanon</td></tr>
<tr><td>grapes</td><td>8</td><td>4</td></tr>
<tr><td>olives</td><td>4</td><td>1</td></tr>
</table>
a) Which country has absolute advantage in which good and why?
b) Which country has comparative advantage in which good and why?
c) If Jordan is endowed with 8000 hours of labor, how much X will it produce after trade begins? How much Y? Explain.
d) What is the allowable range on Jordan's wages relative to Lebanon's if trade is flowing between these two countries according to comparative advantage?
2. Home has 1200 units of labor available. It can produce two goods, apples and bananas. The unit labor requirement in apple productio while in banana production it is 2.
a) Graph home's production possibility curve.
b) What is the opportunity cost of apples in terms of bananas?
c) In the absence of trade, what would the price of apples in terms of bananas be? Why?
3. Explain how trade will tend to emerge along lines of comparative advantage if markets are allowed to work freely.
4. What is meant by " Fair Trade " ? Are there organizations, or affiliations for world organizations in Jordan, that are engaged actively supporting producers to export?</td></tr>
</table>

Module 3	Resources and Trade: **The Heckscher-Ohlin (HO) Model.**
Key Concepts	Factor abundance, factor intensity, biased expansion of production possibilities, factor proportion theory.
Overview	The Heckscher- Ohlin model is based on two goods that are produced using two factors of production. The two goods differ in their intensity. A country that has a large supply of one resource relative to its supply of other resources is abundant in that resource. A c will tend to produce relatively more of goods that use its abundant resources intensively. The result is the basic H-O theory of Countries tend to export goods that are intensive in the factors with which they are a abundantly supplied.
Aim	The HO model is considered a primary tool of general equilibriums analysis for open economies. As such, this chapter seeks to p students with a clear but relatively analytical introduction to the model.
Learning Outcomes	At the end of this module learners will be able to: • Explain how differences in resources can cause international trade. • Discuss why trade often creates losers as well as winners. • Understand the meaning of gains from trade when there are losers. • Discuss the reasons why trade is a politically contentious issue and the arguments for free trade despite the existence o losers. • Understand the concept of sustainability and its relation to natural resources. • Discuss why each generation should leave the environment not worse off, and not damaged by depletion of resources o pollution of land, water and atmosphere.
Units	Chapter 4
Readings	- Donald Davis and David Weinstein. "An Account of Global Factor Trade." National Bureau of Economic Research working Paper No. 1998. - Paul Samuelson, "International Trade and the Equalization of Factor Prices." Economic Journal 58(1948), PP. 163-184.
Activity	1. Explain carefully why the assumption of identical technology worldwide eliminates the classical basis for international trade. 2. Explain how free international trade tends to lead to factor price equalization under the assumption of the HO model? What does this predict about which groups should be in favor of or opposed to free international trade? 3. The world's poorest countries cannot find anything to export. There is neither resource that is abundant- certainly not capital nor land

	small poor nations not even labor is abundant. Discuss
Module 4	**The Standard Trade Model.**
Key Concepts	Export biased growth, import biased growth, immiserizing growth.
Overview	This model has been developed, as a mixture of the Ricardian model and Heckscher-Ohlin model, in order to be more capable to a real problems. The two mentioned models may be viewed as special cases of a more general model of a trading world economy. A many important issues in international economies can be conducted in terms of this general model, with only the details depend which special model we choose. These issues include effects of shifts in world demand resulting from foreign aid; and simulation s supply and demand resulting from tariffs and export subsidies.
Aim	The aim of this module is to develop the ability of students to reason accurately and analyse real problems and issues of world trade.
Learning Outcomes	After reading this module, students will be able to: • Understand how the components of the standard trade model production possibilities curve, isovalue lines and indiff curves fit together to illustrate how trade patterns are established by a combination of supply – side and demand factors. • Recognize how changes in the terms of trade, economic growth and transfers between nations affect the welfare of n engaged in international – trade, and recognize the relation between trade, development and growth . • Understand the impact of trade between trading nations on the distribution of income and welfare within these countr • Understand the interaction between the three dimensions of development: economic, social and environmental throug combining trade theory with the theory of externalities to show how the basic principle of gains from trade must be mo in a real world with many environmental complications. • Discuss how the issues related to sustainable trade and "greening" global environment institutions can be placed in th context of real – world policy.
Units	Chapter 5
Readings	- Paul krugman. " Does Third World Growth Hurt First World Prosperity? " Harvard Business Review 72 (July – August 1994), PP. 11 121. - John Whalley. Trade Liberalization Among Major World Trading Areas. Cambridge: MIT Press, 1985.

Activity	1. Countries A and B have two factors of production, capital and labor, with which they produce two goods, X and Y. Technology is the in the two countries. X is capital – intensive; A is capital abundant. Analyze the effects on the terms of trade and the welfare of the two countries of the following: a) An increase in A's capital stock. b) An increase in A's labor supply. c) An increase in B's capital stock. d) An increase in B's labor supply. 2. Assume that Norway and Sweden trade with each other, with Norway exporting fish to Sweden and Sweden exporting volvos (autom to Norway. Illustrate the gains from trade between the two countries using the standard trade model, assuming first that tastes for the are the same in both countries, but the production possibilities curves differ: Norway has a long coast that borders on the north Atlant making it relatively more productive in fishing. Sweden has a greater endowment of capital making it relatively more productive in automobiles. 3. In practice much foreign aid is "tied"; that is, it comes with restrictions that require the recipient spend the aid on goods from the donc country. For example, Germany might provide money for an irrigation project in Africa, on the condition that the pumps, pipeline, an construction equipment be purchased from Germany. How does such tying of aid affect the transfer problem analysis? Does tying of a make sense from the donor's point of view? Can you think of a scenario in which tied aid usually makes the recipient worse off? 4. Do you think that Saudi Arabia has experienced immiserizing growth at the end of the seventies and beginning of the eighties of the l century? (The price of oil has increased substantially in this period).
Module 5	Economies of Scale, Imperfect Competition and International Trade.
Key Concepts	Monopolistic competition, internal and external economics of scale, interindustry and intraindustry trade, dumping.
Overview	Economies of scale give countries an incentive to specialize and trade even in the absence of differences between countries i resources or technology. Economies of scale can be internal (depending on the size of the firm) or external (depending on the size industry).
Aim	The aim of this module is to focus on another cause of international trade, other than differences in comparative advantage. Trad arise between countries to achieve economies of scale in production. And we want to also to show how in the real world patt

	international trade reflect the interaction of both these motives.
Learning Outcomes	After reading this module students will be able to: • Recognize why international trade often occurs from increasing returns to scale and imperfect competition. • Understand the source of intraindustry trade and how it differs from interindustry trade. • Detail the "dumping" arguments used by domestic industries as a basis for protectionism.
Units	Chapter 6
Readings	- Henryk Kierzkowski, ed. Monopolistic Competition in International trade, Oxford: Clarendon Press. 1984. - Micheal Porter. The competitive Advantage of Nations. New York, Free Press, 1990.
Activity	• Give two examples of products that are traded on international markets for which there are increasing returns. • Evaluate the relative importance of economies of scale and comparative advantage in causing the following: a) Most of the world's aluminum is smelted in Norway or Canada. b) Much of the world's best olive oil comes from the Mediterranean countries, including Jordan. c) Half of the world's large jet aircraft are assembled in Seattle in the United States. d) Most of the semiconductors are manufactured in either the United States or Japan. e) Investigate the situation of Jordan with respect to dumping. Discuss one of the cases (if any) of dumping in Jordan.
Module 6	**International Factor Movements**
Key Concepts	International labor mobility, direct foreign investment and multinational firms, international borrowing and lending.
Overview	International factor movements can sometimes substitute for trade, so international migration of labor is similar in its causes and ef international trade based on differences in resources. International borrowing and lending can be viewed as a kind of internationa but one that involves trade of present consumption for future consumption. Multinational firms primarily exist as ways of ext control over activities taking places in two or more different countries.
Aim	The main aim here is to enhance understanding that the essentials underlying international trade in goods can – in principle – be app on factors movements. Also, the effects of their movements will be analysed .
Learning Outcomes	After reading this module, students will be able to: • Discuss the causes as well as the winners and losers from migration and labor mobility between nations.

	• Understand theories that explain international capital flows, as well as the existence of multinational firms and the motivation for foreign direct investment across economies. • Discuss some aspects related to migration and capital flows, such as: investor rights and labor standards.
Units	Chapter 7
Readings	- Charles P. Kindleberger. Europe's Postwar Growth: The Role of Labor Supply. Cambridge : Harvard University Press, 1967. - Richard A. Breeher and Robert C. Feenstra. " International Trade and capital Mobility Between Diversified Economics" Journal of International Economics 14 (May 1983). - Richard E. Caves. Multinational Enterprises and Economic Analysis. Cambridge: Harvard University Press, 1982.
Activity	1. Explain the analogy between international borrowing and lending and ordinary international trade. 2. Which of the following are direct foreign investment, and which are not? a) A Saudi businessman buys $10 million of IBM stock? b) The same businessman buys a Jordan apartment building. c) A French company merges with an American company; stockholding in the U.S. company exchange their stock for shares in t French firms.
Module 7	**Trade Policies and Trade Agreements**
Key Concepts	Tariffs, import quota, nontariff barriers, protectionism, strategic trade policy, free trade area, and custom union, WTO.
Overview	This module examines some of the reasons governments do not base their policy on economists' cost – benefit calculations. Sophis arguments for government intervention in trade emerged in advanced countries (strategic – trade policy) and in developing co (effects of trade on workers).
Aim	To introduce students to the reasons behind restricting trade flows and with what instruments.
Learning Outcomes	After reading this module, students will be able to: • Evaluate the costs and benefits of tariffs, their welfare effects, and winners and losers from tariff policies. • Discuss other important instruments of trade policy. • Evaluate national welfare arguments against free trade. • Relate the theory and evidence behind "political economy" views of trade policy. • Explain how international negotiations and agreements have promoted world trade.

	• Discuss the "infant industry argument" • Evaluate the claims of the anti – globalization movement related to trade effects on workers, labor standards, and the environment in l the counter arguments.
Units	Chapter 8 (The instruments of trade policy) ; 9 (the political economy of trade policy); 10 (trade policy in developing countries and controversies in trade policy).
Readings	- W.M Corden. The Theory of Protection. Oxford : Clarendon Press, 1971. - Robert E. Baldwin. " Trade Policies in Developing Countries," in Roland W. Jones and Peter B. Kenen, eds. Handbook of Internationa Economics, vol. 1. Amesterdam. North – Holand 1984. - World Bank. World Development Report 2005. Equity and Development. - Kimberly Ann Elliot. Can Labor standards Improve Under Globalization? Washington, D.C. : Institute for International Economics. 2 - European Parliament, Directorate – General for External Policy – Policy Department. International Trade Policy in the Context of Cli Change Imperative, 2010.
Activity	1. What are advantages and disadvantages of instituting higher labor standards in developing countries? 2. What is the main critique against the WTO with respect to environmental protection? How does the WTO justify its position on trade disputes that involve environmental issues? 3. What were some of the reasons for the decline in import – substituting industrialization strategy in favor of a strategy that promotes o trade? Which strategy is more successful in the case of Jordan, as a small economy? Why? 4. Suppose that Jordan (the small country case) can import a, good at a world price of 10 per unit. The domestic supply curve of the goo 50+5p, the demand curve is D= 400 – 10p. In addition, each unit of production yields a marginal social benefit of 10. a) Evaluate the total effect on welfare of a tariff of 5 units levied on imports. b) Calculate the total effect of a production subsidy of 5 units. c) Why does the production subsidy produce a greater gain in welfare than tariff?

Course	International Political Economy
Module 1	**Introduction and Basic Concepts.**
Key Concepts	Interaction of economics and politics.
Overview	This module is a general introduction on the international political economy. It emphasizes the interconnectedness between economics and politics at the international level. Major concepts and topics at the international level are explored in a general manner.
Aim	To give a general idea about the concepts and issues of international political economy.
Learning Outcomes	After taking this module, students should be able to : • Realize the interaction nature of economics and politics. • Understand the general meaning of the main concepts of this subject.
Units	1: Introduction and basic concepts
Readings	
Activity	• Explain why both economy and politics are interconnected.
Module 2	Definition of economic scince and economic problem
Key Concepts	Scarcity and efficiency, normative vs. positive economics, Laissez-faire, mixed economies, production-possipilities curve, opportunity cost.
Overview	As the "International Political Economy" trys to explore the interaction of economics and politics in global affairs, it is convenient to introduce at first the definition of " Economics ", and to explain how societies solve the three problems of economic organization, (what, How and for whom). Also this module through constructing the " production possibilities curve ", can illustrate many basic economic processes and issues. .

Aim	To introduce students to basic concepts of economics and the economic problem.
Learning Outcomes	At the end of this module, students will be able to: • Understand what is economics about. • Analyse key idea in economics such as: unlimited wants, scarce resources and that society must use them efficiently.
Units	2. Definition of economic science and economic problem
Readings	- Samuelson – Nordhous. Economics. MASS INSITTUTE of TECH, 19 th Edition 2010. - Robert Heilbronet, the world philosophers, seventh Edition, 1999.
Activity	* Define each of the following terms carefully and give examples: PPC, scarcity, production efficiency, inputs, outputs. * Many scientists believe that we are rapidly depleting our natural resources. Assume that there are only two inputs (labor and natural resources) produce two goods (concerts and gasoline) with no improvement in society's technology over time. Show what would happen to PPC over time as natural resources are exhausted. How would invention and technological improvement modify your answer on the basis of this example, explain why it is said that " economic growth is a race between depletion and invention "
Module 3	Development and analysis of different schools of economic thought **.**
Key Concepts	Classical school, new classical economic thought, Chicago school of economics.
Overview	This module deals with different thinkers and theories in the political economy and economics. These schools of economic thought include : Islamic economics (Ibn Khaldun), Mercantilism (nationalism and international trade) the physiocrats (and the circular flow), classical economics, capitalism, communism and Karl Marx, Neoclassical economic thought. John Mynard Keynes and Keynesianism, the globalization era, the Chicago school of economics, Milton Freedman (capitalism and freedom). This module includes also main arguments made by these schools and their impacts on the economy.
Aim	The aim of this modules is to provide students with a base to understand the development of ideas and

	points of view toward economic issues and the impacts of these thoughts on policymakers.
Learning Outcomes	• Identify and discuss the different schools of economic thought. • Discuss how thoughts can have an impact on the economy, and how can they change it.
Units	
Readings	
Activity	* What is the main differences between the classical school and keynesian school? How did each of them affect economic policy?
Module 4	**Economic Systems.**
Key Concepts	Economic system of Islam, capitalism, socialism and communism, mixed economy.
Overview	Main criteria to distinguish between the different economic system are: ownership of means of production, the role of the government in the economy, the role of the profit motive in directing business, and the distribution of wealth and income among the people. The major economic systems are: Islamic economic system, capitalism and socialism.
Aim	To provide students with the characteristics of each of the major economic systems and to show them how these systems are different in political, economic and social aspects.
Learning Outcomes	At the end of this module learners will be able to: • Discuss the characteristics of each of the Islamic economic system, capitalism and socialism. • Differentiate among the main economic systems
Units	
Readings	
Activity	• Discuss the (pros) and (cons) of the major economic systems.
Module 5	Sustainable Global Development.
Key Concepts	Economic, social and environmental dimensions or " ecology, economy and equity ".

Overview	A widely accepted definition of sustainable development is the general definition of Bruntland (1987). It is understood that this concept encompasses a number of areas and highlights sustainability as the idea of international global issues of environmental, economic and social progress and equaty, all within is based on the limits of natural resources. This concept is based on elements of nature, life support, community (peace and culture), people and economy. Although in theory, development that is sustainable and not damaging to the planet is very possible, inreality there are a lot of politics and challenges involved.
Aim	To introduce the concept of global sustainable development in terms of issues, impacts, institutions and technology.
Learning Outcomes	After reading this module students will be able to: • Understand the meaning of global sustained development and its different elements . • Know how much progress has been attained in sustainable development since the 1992 Rio Earth summit. • Discuss the political challenges in facing this issue.
Units	
Readings	الأمن و الإقتصاد, د.أحمد العوران
Activity	Discuss the climate-land-energy-water-development nexus in the case of Jordan.
Module 6	**Financial and monetary systems, international finance third world debt and the macroeconomic controversy.**
Key Concepts	Bretton Woods System, IMF, Developing-country borrowing and debt.
Overview	This module covers several issues related to international finance, global capital flows and the global distribution of income, focusing on the impacts of the global institution on developing counties.
Aim	To explain international and monetary systems, as well as the third world debt and the debate on the IMF-WB structural adjustment programs

Learning Outcomes	After reading this module, students will be able to: • Understand the Bretton Woods System. • Discuss the need for reforming the world's finanicial " architecture "
Units	Unit 8 : Financial system and fiscal policy. Unit 9 : International Finance. Unit 10 : Third world debt and the macroeconomic stabilization controversy.
Readings	
Activity	Discuss the relation between politics and the international monetary – financial instutions.
Module 7	**Trade policy, FDI and foreign aid.**
Key Concepts	Trade policy, WTO, regional trade agreements, FDI.
Overview	This module emphasizes the importance of the issues related to trade policy and how this is dominated by political considerations. Also the flow of foreign direct investment and foreign aid will be discussed.
Aim	To provide students with major concepts on the international flow of capital, aid and trade, as well as discussing this with respect of developing countries.
Learning Outcomes	After completion of this module students will be able to : • Understand how some restrictions on the flow of international trade, foreign direct investment are desirable, particularly for developing countries.
Units	Unit 11 : Trade policy, regional and world trade organizations. Unit 12 : Direct foreign investment and foreign aid.
Readings	
Activity	Discuss the impact of the trade agreement among Arab countries (GAFTA) on Arab's trade and welfare.
Module 8	**The global environmental threat and climate protection.**
Key Concepts	Externalities, air / water pollution, ozone depletion, global warming, solid waste management .

Overview	This module is a general introduction to the environmental threat and climate change. The emphasis is an identification sources of environmental problems, valuing environmental resources and designing environmental policy within the global framework. Climate change elements are also considered. These include: global warming, Kyoto protocol, the role of economic instruments, the role of energy prices, developing countries and climate change, and the transition to renewable energy.
Aim	To give an overall idea about the environmental threat pacing the globa, and how to deal with climate change, emphasizing that these two topics are fully global (and ethical) phenomenon.
Learning Outcomes	After taking this module, students will be able to : • Explain the foundations of environmental problems, conflicts and policy. • Understand that there is a need for globally coordinated action.
Units	Unit 13 : The global environmental threat. Unit 14 : Climate protection.
Readings	* Ahmad M. Hussen. Principles of Environmental Economics and sustainability An Integrated Economic and Ecological Approach, 3rd Edition. Routledge – 2012. * Nick Hanley and Anthonoy Owen. The Economics of Climate Change, Routledge, 2004.
Activity	• Carry out economic analysis of a real-world environmental issue facing Jordan. What solutions do you propose? • Discuss the extent of cooperation among developing and developed countries with respect to facing the global environmental threat and climate protection.

Course	**International Finance**
Module 1	

Key Concepts	Introduction National Income Accounting and the Balance of Payments.
Overview	We try to explain the accounting concepts economists use to describe a country's level of production and its international transactions. We use two related and essential tools for macroeconomic linkages. The first tool is the national income accounting, records all the expenditures that contribute to a country's income and output. The second tool, balance of payments accounting. Student should know how can economic policy ensure that factors of production are fully employed? And what determines how an economy's capacity to produce goods and services changes over time? To answer these questions, we must understand macroeconomics, the branch of economics that studies how economies' overall levels of employment, production, and growth are determined.
Aim	The aim of this module is to make students able to discuss how the interactions of national economies influence the worldwide pattern of macroeconomic activities.
Learning Outcomes	At the end of this module learners will be able to: - Discuss the concept of the current account balance. - Use the current account balance to extend national income accounting to open economies. - Relate the current account to changes in a country's net foreign wealth.
Units	Unit 13 National Income Accounting and Balance of Payments.
Readings	Monthly Bulletin, Central Bank of Jordan, 2014. التجارة الدولية نظريات و سياسات، الدكتور طالب عوض، 1995
Activity	**Overview**
	- Student draw the relationship between the national income identities in open economy: Y=C+I+G+CA(EX-IM)

	- The balance of payment keeps track of country's payments to and receipts from foreigners. The students should get the POB of Jordan and from the CBJ from the website and analyze the figures in each term. - Understanding the statistical concepts from monthly statistical bulletin. - Write examples of paired transactions: **Credit** **Debit** Fax machine purchase (Current account, U.S. good import) $1,000 Sale of bank deposit by Citibank (Financial account, U.S. asset sale) $1,000 - The officials reserves of Jordan in the BOP will be observed by students during the semester and analyzing its position and the economic stand. - Jordan's Balance of Payments, 2013.
Module 2	The exchange Rates Market and the Determinants
Key Concepts	
Overview	Introduce how the exchange rates is determined using the asset approach. In this approach student will recognize how the exchange rates market work. Describing all the variables and situations that affect the exchange rates. The student must know how the changes in interest rate expectations and the spot rates affect the expected returns on foreign deposit. How does money market influence the foreign exchange market?
Aim	The main goal is to understand the role of exchange rates in international trade activity and to understand how exchange rates are determined.
Learning Outcomes	At the end of this module learners will be able to: - Relate exchange rate changes to changes in the relative prices of countries' exports. - Describe the structure and functions of the foreign exchange market. - Apply the interest parity condition to find equilibrium exchange rates. - Find the effects of interest rates and expectation shifts on exchange rates.

	- Show how monetary policy and interest rates feed into the foreign exchange market. - Draw the relationship between the short-run and the long-run effects of monetary policy.
Units	Unit 14: Exchange rates and foreign exchange market Unit 15: Money, interest rates, and exchange rates.
Readings	Paul R. Krugman. "The International Role of the Dollar: Theory and Prospect," in John F. O. Bilson and Richard C. Marston, eds. *Exchange Rate Theory and Practice*. Chicago: University of Chicago Press, 1984, pp. 261–278. Theoretical and empirical analysis of the dollar's position as an "international money." Ben S. Bernanke, Thomas Laubach, Frederic S. Mishkin, and Adam S. Posen. Inflation Targeting: Lessons from the International Experience. Princeton, NJ: Princeton University Press, 1999. Discusses recent monetary policy experience and the consequences for inflation and other macroeconomic Rudiger Dornbusch. "Expectations and Exchange Rate Dynamics." *Journal of Political Economy* 84(December 1976), pp. 1161–1176. A theoretical analysis of exchange rate overshooting. Events in international finance issues will be followed and discussed. The Jordan times, The Economists, The Financial Times, are Journals that student may find useful as a source of information. Global Finance, https://www.gfmag.com/.
Activity	**Overview**
	Construct a model of foreign exchange rates market. Visit the Central bank of Jordan, the main financial institution in Jordan.

Module 3	Relative Prices and the Exchange Rates in the Long Run
Overview	Many investors found price changes difficult to foresee, and as a consequence wealth were lost—and made—in the foreign exchange market. In this module student should acknowledge the question of What economic forces lie behind such dramatic long-term movements in exchange rates? National price levels play a crucial role in determining both interest rates and the relative prices at which countries' products are traded from long run perspective. A theory of how national price levels interact with exchange rates is thus central to understanding why exchange rates can change dramatically over periods of several years. Theory of purchasing power parity (PPP) explains movements in the exchange rate between two countries' currencies by changes in the countries' price levels. Next, the students will determine the reasons why PPP may fail to give accurate long-run predictions and show how the theory must sometimes be modified to account for supply or demand shifts in countries' output markets.
Aim	This module aims to understand factors other than money supplies and demands that also can have sustained effects on exchange rates.
Learning Outcomes	At the end of this module learners will be able to: - Explain the purchasing power parity theory of exchange rates and its relationship to international goods-market integration. - Express how monetary factors such as ongoing price level inflation affect exchange rates in the long run. - Understand factors that affect real exchange rates and relative currency prices in the long run.
Units	Ch. 16 Relative Prices and the Exchange Rates
Readings	Taylor, A. and M. Taylor (2004), "The Purchasing Power Parity Debate", Journal of Economic Perspectives, Vol. 18, NO. 4, pp. 135-58

	Purchasing Power Parity: Weights Matter Finance & Development ,*Tim Callen*,2012 http://www.imf.org/external/pubs/ft/fandd/basics/ppp.htm
Activity	**Overview** *Assignment 1:* student should answer the following questions: 1) Explain the nature of the relationship between the increasing rate in the money supply and the increasing rate in prices (inflation), using a time series represents the variables available for Jordan. (You can use the electronic pages of central bank of Jordan to get the material required). 2) Assume that there is a decrease in the overall real demand for money. What are the short and long runs effects on exchange rates, interest rate and the general level of prices? 3) What is the name of the currency of each of the following countries: Brazil, Mexico, Malaysia, India, Morocco, Egypt, Mauritania, Belgium, Sweden, Australia, Libya, Kuwait, South Africa, China? 4) Suppose that the inflation rate in Russia was 50% within one year, and the rate of inflation in Britain only 10% in the same year. According to the relative purchasing power parity(Relative PPP) What will happen during the year to the exchange rate of the pound sterling against the Russian ruble?
Module 4	Current Account Determination

Overview	We now combine what we have learned about asset markets and the long-run behavior of exchange rates with a new element, a theory of how the real sector "output market" adjusts to demand changes when product prices in the economy are themselves slow to adjust.
Aim	The aim of this module is to restructure the complicated factors that cause output, exchange rates, and inflation to change, and examining how output and the exchange rate are determined in the short run.
Learning Outcomes	At the end of this module learners will be able to: - Clarify the role of the real exchange rate in determining the aggregate demand for a country's output. - Explain how monetary and fiscal policies affect the exchange rate and national output in the short run. - Describe and interpret the long-run effects of permanent macroeconomic changes. - Analyze the relationship among macroeconomic policies, the current account balance, and the exchange rate.
Units	Ch.17 Output and the Exchange Rate in the Short Run
Readings	Mann, C (2002), "Perspectives on the U.S. Current Account Deficit and Sustainability", Journal of Economic Perspectives, Vol. 16, No.3, pp. 131-52. Robert A. Mundell. *International Economics*, chapter 17. New York: Macmillan, 1968. A classic account of macroeconomic policy effects under floating exchange rates. Dominick Salvatore, international economics, ch.19;Wiley,"Prices and Output in an Open Economy: Aggregate Demand and Aggregate Supply.2005.
Activity	**Overview**

	The student will do a research about Financial Crisis the causes , effects and solutions. Students work in groups of 5. Each group chose a country to study its economic and social characteristics and explore any economic or financial crisis and how each country solve its economic problems through applying the policy instruments they took during the semester. they suppose to be a future analyst in economic field. Students used all the tools and theories -they took in this semester and others - to understand and predict the economic crises and the way each country solve its finance problems. The Key objectives for this practice are: 1- Practice, analysing and predict the different types of economic crises and its causes. 2- Implement the monetary and fiscal policy and other macroeconomic variables in the open economy. Each group choose a country and then try to collect the data they need for their country and study its own characteristics. They use graphs and tables, to explain their ideas. Meet some decision makers to see how and why policy is been talking this way or another. Then they submit the final draft of their projects and each group present their result and discuss it with the class.
Module 5	**International Macroeconomic Policy**
Key Concepts	Fixed Exchange Rates, The International Monetary System
Overview	In this module the students will explore the issue of how central banks intervene in the foreign exchange market to fix exchange rates and how macroeconomic policies work when exchange rates are fixed. This will help us understand the role of central bank

	foreign exchange intervention in the determination of exchange rates under a system of managed floating. Also it will examine how the international monetary system influenced macroeconomic policy making and performance during four periods: the gold standard era (1870–1914), the interwar period (1918–1939), the post–World War II years during which exchange rates were fixed under the Bretton Woods agreement (1946–1973), and the recent period of widespread reliance on floating exchange rates (1973–present). In an open economy, macroeconomic policy has two essential goals, internal balance and external balance in this context we will try to relate both targets with sustainability matter. The goal of external balance presents a clear picture of how policy actions taken abroad may change an economy's position relative to the position its government prefers.
Aim	The aim of this module is to provide students with the a number of international currency arrangements since 1870, and explain how did countries try to attain internal and external balance, and how successful were they.
Learning Outcomes	At the end of this module learners will be able to: - Discuss causes and effects of balance of payments crises. - Describe how alternative multilateral systems for pegging exchange rates work. - Explain how the goals of internal and external balance motivate economic policy makers in open economies. - Describe the structure of the international gold standard that linked countries' exchange rates and policies prior to World War I, and the role of the Great Depression of the 1930s in ending efforts to restore the pre-1914 world monetary order and related to some cultural effects. - Discuss how the post–World War II Bretton Woods system of globally fixed

	exchange rates was designed to combine exchange rate stability with limited autonomy of national macroeconomic policies.
Units	Ch. 18: Fixed Exchange Rates and Foreign Exchange Intervention. Ch.19: The International Monetary System, 1870-1973.
Readings	Michael Mussa. *The Role of Official Intervention*. Occasional Paper 6. New York: Group of Thirty, 1981. Discusses the theory and practice of central bank foreign exchange intervention under a dirty float. Olivier Jeanne. *Currency Crises: A Perspective on Recent Theoretical Developments*. Princeton Special Papers in International Economics 20. International Finance Section, Department of Economics, Princeton University, March 2000. Recent thinking on speculative crises and attacks. Harold James. *The End of Globalization: Lessons from the Great Depression.* Cambridge, MA: Harvard University Press, 2001. Political and economic analysis of international economic disintegration between 1914 and 1939. Maurice Obstfeld and Alan M. Taylor. *Global Capital Markets: Integration, Crisis, and Growth.* Cambridge, U.K.: Cambridge University Press, 2004. Overview of the linkages between international financial integration and exchange rate regimes. John Williamson. *The Exchange Rate System*, 2nd edition. Policy Analyses in International Economics 5. Washington, D.C.: Institute for International Economics, 1985. An indictment of floating exchange rates and a case for target zones.
Activity	**Overview**
	Watching a documentary film in title: "End of the Road; How Money Became Worthless"

	The students discuss the financial crisis 2008 and try to analyze what documentary suggested and predicted.
Module 6	introduction of climate change problem
Key Concepts	
Overview	In this module we will try to explore the climate change as an environmental issue and relate it to the international finance subject from sustainability perspective.
Aim	The aim of this module is to learn how to link the environmental economic specifically climate change matter with global finance.
Learning Outcomes	At the end of this module learners will be able to: - Explain the climate change as an international issue and clarify it from economic prospect. - Link the climate change with international macroeconomic policy.
Units	- The economics of climate change.
Readings	A compilation of hands-out: • The economics of climate change, Anothony D. Owen, Nick Hanley,2004.
Activity	**Overview**
	Discuss the new issues regarding the climate change and international finance. Students start to represent their paper.
Module 7	Developing Countries: Growth, Crisis, global warming and climate change.
Key Concepts	Growth, sustainability, climate change
Overview	Student should explore these new issues ant try to find the link between

	them through searching new resources and contact environmental institution in Jordan and see the environmental policies that have been adopted by government of Jordan and the financial issues that may create some restrictions.
Aim	The aim of this module is to help students relate the financial crisis with sustainability policies.
Learning Outcomes	At the end of this module learners will be able to: - Understand the relationship between climate change and financial crisis. - Discuss this question: Is there any impact of global financial crisis on climate change?
Units	Climate change and the financial crisis
Readings	Climate Change and the Global Financial Crisis, Robin Leichenko, Karen O'Brien and William Solecki**.** Climate change and the financial crisis: A case of double Exposure**,** Robin M. Leichenko, Karen L. O'Brien, and William D. Solecki**,** *Annals of the Association of American Geographers*, 100(4) 2010, pp. 963–972 C, Published by Taylor & Francis, LLC. The economics of climate change, Anothony D. Owen, Nick Hanley**,** 2004. International Climate Change Financing: The Green Climate Fund (GCF). Richard K. Lattanzio Analyst in Environmental Policy, Congressional Research Service April 16, 2013. The Effect of the Global Financial Crisis on Climate Change, Imogen Reed. Posted on April 13, 2012 . Climate Change May Trigger the Next Financial Crisis. What is the impact of the economic crisis on the climate change debate? Question submitted by

	Soumaya Maghnouj, from Sciences-Po, March 22, 2013 Answered by: Daniel P. Ahn, Adjunct Fellow for Energy
Activity	**Overview**
	Explain and discuss the relationship between the financial crisis and climate change problem. Watching movies related these two issues. Continue presenting the papers done by students in the class.

Course Syllabus

0305100

University of Jordan, Faculty of Science,
Department of Applied Geology and Environment
First Semester, 2014-2015

Instructor Information

Instructor:	Fathi Shaqour
Office Location:	Geology Building, first floor
Office Telephone:	22281
Office Hours:	12:30 – 13:30 Sunday, Monday, Tuseday and Wednesday.
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Course Identification

Course Number:	0305100
Course Name:	Environmental Science
Course Location:	Geology
Class Times:	12-13 Sunday, Tuesday and Thursday
Prerequisites:	None

Course Description/Overview

Environment is a science discipline. Our understanding of environmental science is developed by adopting the scientific method whereby data is collected by investigation or observation and used to formulate and test hypotheses. It depends on scientists being objective and sharing all their data, methods and ideas with their peers, by publishing their findings. This allows other scientists to further analyse and build on this body of knowledge by which we learn about Engineering Geology. Professional scientists must always acknowledge their sources. **Plagiarism** is the presentation of thought or work of another person as though it is one's own without proper acknowledgment. The University's regulations make it clear that plagiarising is a breach of student discipline and may incur a range of penalties.

Course Objectives

Main objectives are the following:

1- To learn the basics of environment and its influencing factors,
2- To learn terms and concepts of the environment and natural resources and hazards (earthquakes, subsidence, coastal processes),
3- To gain appreciation to the interacting parameters those contribute to interchangeable influences between human and the surrounding environment.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

4. Demonstrate an understanding of the terms, concepts and principles of the environment,
5. Demonstrate an understanding of the Earth resources and hazards (earthquakes, volcanic activity, erosion and mass wasting),
6. Develop awareness of the role of human for better environmental management.

Course Resources

Text book, power point lectures, hand outs wherever needed

Course Website(s): www.ju.edu.jo

Required Course Texts and Materials

1. Environmental Science Earth as a living planet, D.BBotkin and E.A Keller, 2010, http://www.ucmp.berkeley.edu/glossary/gloss5/biome/

Optional Course Texts and Materials

1. CheckUJ library and Google books for other references. http://books.google.com.au/books……..

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

First test	20
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time.Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion. According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses only. No makeup for non-exam activities.

Course Schedule

Week	Ref.	Topic
1	Ch.1 Lecture	1- Introduction to environmental science: discuss the syllabus, why study the course, General information 2- Major themes, human population and famine, 3- Sustainability and carrying capacity.

2	Chs.2-4 Lecture slides	4- The scientific method and environmental sciences; what is science and scientific method, science and technology, 5- How to think about complex systems; systems stability, environmental unity, Earth as a living system and life, ecosystems. 6- Population dynamics and human population, population growth (past and present), population and technology, quality of life and limiting factors.
3	Chs5-7 Lecture slides	7- The chemistry of life; biogeochemical cycles, ecosystem cycles (metal and non-metal), 8- Ecosystems: The unit that sustains life, basic characteristics of ecosystems, ecological systems, food chains, community interactions, 9- Diversity of life; evolution, natural selection, evolution of life,
4	Chs8,11 & 12 Lecture	10-Biomes; Biotic provinces, geographical patterns of life, Earth biomes, forests, deserts, wetlands, fresh and sea water, 11-The ecology of food production; can we feed the world?, what we eat and grow, history and future of agriculture, 12-Farming and the environment; soil degradation, soil sustainability
5	Chs 13 & 15, Lecture	13-Forests and the environment; forestation and deforestation 14- **First Exam** 15-How the environment affects our health; disease, pollution,
6	Ch.16, &17 Lecture	16-Chance and catastrophes; hazards, disasters, 17-Chance and catastrophes; hazards, disasters, 18-Energy concepts;
7	Chs.18, 21, Lecture	19- Oil, natural gas and coal 20-How we obtain and use water, 21- How we obtain and use water,
8	Chs 22, & 23 Lect.	22-How we pollute and clean water, 23-How we pollute and clean water, 24-Global worming

9	Chs 23, 24, Lectures	25-Global worming 26-Air pollution; sources and effects, 27-Air pollution; sources and effects,
10	Chs 25, Lectures	28-**Second Exam** 29-The air we breathe indoors; sources, symptoms, 30-The air we breathe indoors; sources, symptoms,
11	Chs. 26, 27, Lecture	31-Mining and environment 32-Mining and environment 33-Environmental economics;
12	Chs. 27, 29, Lecture	34-Environmental economics; 35-Treating wastes 36-Treating wastes
13		Revision and applications

Course Syllabus

0935473 Environmental Engineering

University of Jordan, Faculty of Engineering & Technology,

Chemical Engineering Department

Fall Semester, 2014-2015

Instructor Information

Instructor: Dr. Ahmad M. AbuYaghi

Office Location: University Campus, Engineering Building, 2nd Floor

Office Telephone: +962 6 535 5000 Ext. 22906

Office Hours: Mon Wed 9:30- 11:00am

E-mail: ahmad.ay55@gmail.com
Faculty Website: http://www2.ju.edu.jo/sites/Academic/abuyaghi/default.aspx

Course Identification

Course Number: **0935473**
Course Name: Environmental Engineering
Course Location: University Campus
Class Times: Mon Wed 11:00am- 12:30pm
Prerequisites: 0955342

Course Description/Overview

Environmental Engineering uses environmental science principles, along with engineering concepts and techniques (design, operation and maintenance of engineering units, structures or equipment) to assess the impacts of societal activities on the environment and the impact of environment on people as well as to protect both human and environmental health. Environmental Engineering is a multidisciplinary area that requires a sound background in various subjects of pure and applied sciences covering both technical and social aspects to deal with the quality and availability of environmental resources. The catalog description of the course is as follows:

Concepts and terminology. Sources and impacts of water pollutants. Conventional water and wastewater treatment processes: Sedimentation, flocculation, softening, filtration, disinfection and biological systems. Sources and impacts of air pollutants. Air pollution control through gas cleaning devices: cyclones and wet scrubbers. Solid waste classification, handling and ultimate disposal.

Course Objectives

The overarching goals of this course are providing students with exposure to the main topics in environmental engineering in a multidisciplinary learning approach that integrates air, water and soil pollution covering issues of from scientific, engineering and management perspectives.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

19. Be familiar with major environmental laws, regulations, standards and ethics.
20. Understand the environmental quality parameters and how to measure and communicate them.
21. Describe the major pollutants of environment as well as their sources, effects, measurement and expression.

22. Select and design basic processes and techniques for water treatment, waste management and pollution control.
23. Appreciate the role and responsibility of engineers in sustainable development .
24. Work in team.

Course Resources

Course Website(s)

Required Course Texts and Materials

31. Davis, M.L. and Cornwell, D.A. Introduction to Environmental Engineering, McGraw-Hill, 5th Edition, 2013. http://www.mcgrawhill.ca/highereducation/products/9780073401140/
32. Peavy, H.S.; D.R. Rowe and G. Tchobanoglous. Environmental Engineering, McGraw-Hill, 1985.
33. Hand-outs prepared by the instructor.

Optional Course Texts and Materials

http\\:

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Assignments	10
Group Project	10
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time. Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion. According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses. No makeup for classwork.

Course Schedule

Week	**Date**	**Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)**
1	15/9/2014	**Course Overview** Discussion of syllabus and evaluation tools, Course requirements and policy, Course Introduction: Concepts and terminology
2	22/9	Overview of ecological and environmental systems: Water, Air and solid waste management
3-4	29/9, 6/10	Environmental ethics, laws, regulations and standards. Environmental impact assessment and sustainability policy.

5-6	13/10, 20/10	Water treatment, water pollution and water quality management Classwork #1
7-9	27/10, 3/11, 10/11	Environmental Microbiology, selection, design and operation of municipal wastewater treatment systems: suspended and attached growth processes, nutrient removal Classwork #2, Midterm Exam
10-11	17/11, 24/11	Air pollution and meteorology, climate change, global, regional and local effects
12	1/12, 8/12	Gas and particulate pollutants sources, effects, dispersion and control. Classwork #3
13-14	8/12, 15/12	Solid waste management including waste minimization, processing, recycling, recovery and ultimate disposal Classwork #4
15	22/12	Introduction to hazardous waste Term Project Submission
16	29/12	Environmental management in Jordan: discussion of policy, practice and case studies in light of what have been learned from course

CLIMASP Course Modules for 0935473 Environmental Engineering

Course	**0935473**
Module 1	Introduction and overview of ecological and environmental systems
Key Concepts	Natural ecosystem, environment, pollution, water quality, water supply, air quality, waste management, role of engineer
Overview	Using the principles of biology and chemistry, environmental engineers develop solutions to environmental problems. They are involved in water and air pollution control, waste recycling and disposal as well as public health issues. Environmental engineering is concerned with local and worldwide environmental issues and is involved in the protection of wildlife.

Aim	To instil an understanding by students of the multidisciplinary nature of Environmental Engineering, basic concepts from natural ecology and main areas of built environment.
Learning Outcomes	At the end of this module, students will be able to: 1. Understand the role of microbiology and chemistry in natural ecosystems 2. Identify the components and process steps of water treatment, wastewater 3. Treatment/disposal, air quality management, solid waste processing/disposal
Units	Unit 1.1 What is Environmental Engineering Unit 1.2 Natural Ecological Systems Unit 1.3 Environmental Engineering Systems
Readings	Search relevant websites, explore resources
Activity	Reading and Class Discussion Read Chapter 1 of textbook (Davis & Cornwell)
Module 2	Environmental ethics, laws, regulations and standards; Environmental impact assessment and sustainability policy.
Key Concepts	Ethics, regulations, standards, sustainable development, EIA
Overview	On key element of modern environmental science and engineering is that they are driven by government policy, which is increasingly set on the basis of risk. Therefore, knowledge of governmental policy and regulations is essential to environmental engineers in their profession
Aim	To familiarize students with common environmental values and national and international regulations at different level to protect the environment
Learning Outcomes	At the end of this module, students will be able to: 1. Disclose environmental ethics for professionals 2. Understand the legal framework for environmental protection 3. Distinguish different types of legislation 4. Understand the relationship between environment and development 5. Appreciate EIA studies as a tool for sustainable development
Units	Unit 2.1 Ethics and Regulations

	Unit 2.2 Sustainable Development and EIA
Readings	Optional reading of the book: Introduction to Environmental Impact Assessment: A Guide to Principles and Practice by Bram F. Noble, Oxford, 2009.
Activity	Website visit, Reading, Class Discussion Visit the website of the Ministry of Environment in Jordan: www.moenv.gov.jo Read about the national environmental regulations including penalty for violations, administrative structure of Ministry, their projects for environmental preservation and enhancement A group Term Project is initiated. Term project is literature or field survey on a topic offered by instructor and chosen by students. A professional technical report is sought.
Module 3	Water treatment, water pollution and water quality management
Key Concepts	Hardness, BOD, TKN, eutrophication, DO sag, coagulation, chlorination, softening
Overview	The responsibilities of the environmental engineer involves design and operation of water treatment processes as well as control of the quality of water supply resources in the open environment. Testing and characterizing pollution parameters are essential to subsequent treatment processes
Aim	To develop an understanding and knowledge on water pollution indicators, factors affecting them and the practical methods of water purification
Learning Outcomes	At the end of this module, students will be able to: 1. Define water quality parameters and describe how they are measured and reported. 2. Understand why and how water quality in streams is deteriorated and restored using Streeter-Phelps DO sag model 3. Draw a full block diagram of surface and ground water treatment processes 4. Understand the chemistry of coagulation, softening and chlorination
Units	Unit 3.1 Water pollution and water quality management

	Unit 3.2 Drinking water treatment processes
Readings	BOD kinetics and Softening chemistry
Activity	Group classwork on problem solving of water chemistry and water pollution parameters, open book and notes
Module 4	Science & Engineering of Wastewater Treatment
Key Concepts	Microbiology, biomass growth, settling, biodegradation, aeration, nitrification / denitrification, phosphorus removal, design, operation
Overview	Among the key elements of modern environmental engineering is that it is based on chemistry, environmental quality is described by chemical composition of the system. Also, knowledge of fundamentals of biology, particularly microbiology, is a pre-requisite to studying wastewater treatment plants
Aim	To enable students understand, select and design the basic units in common municipal wast treatment plants.
Learning Outcomes	At the end of this module, students will be able to: 1. Understand the role of microorganisms in wastewater treatment 2. Know how to design a bioreactor in a suspended growth biological system based on growth kinetics 3. Able to select proper treatment system/process based on wastewater characteristics and other considerations
Units	Unit 4.1: Suspended growth aerobic system (mainly activated sludge process) Unit 4.2: Fixed growth system (Trickling filters and RBC) Unit 4.3: Biological removal of nitrogen and phosphorus Unit 4.4 Sludge Treatment and disposal (including anaerobic digestion)
Readings	Anaerobic pathways and biogas production
Activity	Group classwork on problem solving and design Midterm Exam
Module 5	Air pollution and Control

Key Concepts	Stratification of atmosphere, climate change, carbon footprint, GHC, ozone depletion, acid rain, smog, health risk, primary and secondary pollutants, dispersion, renewable energy, collection efficiency
Overview	The atmosphere is a complex natural gaseous system that is essential to support life on planet E Air pollution due to both natural and anthropogenic sources is a major health and environmental hazard. The amounts and types of emissions change every year; caused by changes in economy, industrial activity, technology improvements, traffic and many other factors. Air pollution regulations and emission controls also have an effect.
Aim	Enable students to examine the various issues related to air pollution at the local, regional and g levels and how to manage and mitigate their consequences
Learning Outcomes	At the end of this module, students will be able to: 1. demonstrate knowledge and understanding of air pollutants, their sources, properties, dispersion and effects 2. demonstrate knowledge and understanding of modern techniques and devices of gas ar particulate removal
Units	Unit 5.1 Air Pollution Unit 5.2 Gas and particulate removal
Readings	Climates change and GHG control
Activity	Group classwork on problem solving and design of air pollution dispersion as well as gas and particulate removal devices
Module 6	Solid Waste Management (SWM)
Key Concepts	Waste classification, minimization, processing, recycling, recovery, landfill, incineration, Disposal, ground water contamination
Overview	Solid waste is not something that is taken to a 'dump' any more. SWM is a comprehensive syst including collection, storage, transportation, processing and ultimately disposal. Recycling is v important from sustainability point of view. Disposal techniques including landfilling, incinera

	and composting. Both the engineering and socio-political aspects will be of considered.
Aim	To enlighten students with basic components of solid waste management and enable them to ex various options of processing, recovery and disposal.
Learning Outcomes	At the end of this module, students will be able to: 1. Recognize different kinds of solid wastes and their general characteristics 2. Formulate a block diagram describing all major steps of SWM. 3. Differentiate between different options of solid waste processing, recycling and dispos 4. Understand the impact of landfills on groundwater pollution and mitigation options
Units	Unit 6.1 Types and characterization of solid waste Unit 6.2 Processing for resource and energy recovery Unit 6.3 Sanitary landfill design and operation
Readings	Ground water pollution due to uncontrolled waste dump
Activity	Group classwork Term project submission

Course Syllabus

0934545 Internal Combustion Engines

University of Jordan, Faculty of Engineering & Technology,

Mechanical Engineering Department

Fall Semester, 2014-2015

Instructor Information

Instructor: Dr. Ahmad Sakhrieh

Office Location: University Campus, Engineering Building, 3rd Floor

Office Telephone: +962 6 535 5000 Ext. 22906

Office Hours: Sun Tue Thu 9:00- 11:00 am

E-mail: asakhrieh@ju.edu.jo
Faculty Website: http://www2.ju.edu.jo/sites/Academic/abuyaghi/default.aspx

Course Identification

Course Number: 0934545
Course Name: Internal Combustion Engines
Course Location: University Campus
Class Times: Sun Tue Thu 12:00am- 13:00pm
Prerequisites: 0904342

Course Description/Overview

The course starts with an introduction to engines, classifications and terminology which leads to the introduction and analysis of engine performance parameters and the main engine cycles including: Otto, Diesel, Dual and two-stroke cycles. Then the course moves to introduce the student to the common fuels used in IC engines, the reactions and the associated thermochemical calculations. This is followed by the introduction of engine emissions and their control technologies and strategies. After that, the student is made familiar with air and fuel induction methods and technologies, in addition to the physics of the combustion phenomena. Finally, the course ends with the evaluation of friction losses and the characterization of different engine lubricants.

Course Objectives

The course is intended to provide the student with the fundamental principles and operational characteristics of internal combustion engines. This will be achieved through covering a wide range of related topics with the support of lab-based experiments.

Course Learning Outcomes

Upon successful completion of this course, will be familiar with the following:

- Engine classifications and definitions
- Engine operating characteristics and performance evaluation
- Engine cycles
- Thermo-chemical calculations
- Properties of different fuels
- Air and fuel induction technologies
- The physics of the combustion phenomena

- Engine pollutants and emissions control strategies
- Friction losses and lubrication

Course Resources

Course Website(s)

Required Course Texts and Materials

34. W. Pulkrabek. Engineering Fundamentals of the Internal Combustion Engine, Prentice Hall, 2nd Int. edition, 2004.
35. Hand-outs prepared by the instructor.

Optional Course Texts and Materials

http\\:

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Assignments	10
Group Project	10
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time.Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion.According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses. No makeup for classwork.

Course Schedule

Week	Date	Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)
1	15/9/2014	**Course Overview** Engine Classification; Terminology; Engine Components; Basic Engine Cycles
2-4	22/9, 29/9, 6,10	**Operating Characteristics**; Engine Parameters; Work; Mean Effective Pressure; Torque and Power; Dynamometers; Air-Fuel Ratio; Specific Fuel Consumption; Engine Efficiencies; Volumetric Efficiency

		Classwork #1
5-7	13/10, 20/10 27/10	**Engine Cycles**; Air Standard Cycles; Otto Cycle; Diesel Cycle; Dual Cycle; Comparison of Cycles; Real Air-Fuel Cycles; Two Stroke Cycles
8-10	3/11,10/11, 17/11	**Thermochemistry and Fuels**; Thermochemistry; Hydrocarbon Fuels; Gasoline Fuel; Diesel Fuel; Alternative Fuels Classwork #2
11-12	24/11,1/12	**Air and Fuel Induction; Intake Manifold;** Intake Valves; Volumetric Efficiency; Fuel Injection; Carburetors; Supercharging and turbocharging; Midterm Exam
13	8/12	**Combustion;** Combustion in SI Engines; Homogeneous and Stratified mixtures; Fast Burn Chambers Classwork #3
14-15	15/12, 22/12	**Emissions and Air Pollution**; Carbon Monoxide; Hydrocarbons; Oxides of Nitrogen; Particulates; Other Emissions; Aftertreatment; Engine Modifications; Fuel Modifications
16	29/12	**Friction and Lubrication**; Engine Friction; Piston Forces; Engine Lubrication Systems; Lubricating Oils Classwork #4

Course	0934545 **Internal Combustion Engine**
Module 1	Introduction and overview of internal combustion engines
Key Concepts	Introducing and defining the internal combustion engine. It lists ways of classifying engin terminology used in engine technology. Descriptions are given of many common engine comp and of basic four-stroke and two-stroke cycles for both spark ignition and compression i engines.
Overview	
Aim	To Understand Engine classifications and components.
Learning Outcomes	At the end of this module, students will be able to: • Identify engine components • Differentiate between 2-stroke and 4-stroke engines
Units	Unit 1.1 Engine Classification; Engine Components; Unit 1.2 Engine Terminology Unit 1.3 Engine Components Unit 1.4 Basic Engine Cycles

Readings	
Activity	Reading and Class Discussion Read Chapter 1 of textbook
Module 2	**Operating Characteristics**.
Key Concepts	Examines the operating characteristics of reciprocating internal combustion engines. These inc the mechanical output parameters of work, torque, and power; the input requirements of air, fu combustion; efficiencies; and emission measurements of engine exhaust
Overview	
Aim	To introduce the students to the main operating characteristics of the internal combustion engir
Learning Outcomes	At the end of this module, students will be able to: • Understand the operating characteristics of the internal combustion engines • Define the inputs and outputs of the combustion process in internal combustion • Identify the exhaust gases.
Units	Unit 2.1 Operating characteristics of reciprocating internal combustion engines Unit 2.2 Emission measurements of engine exhaust
Readings	Optional reading of the book: Introduction to Environmental Impact Assessment: A Guide to Principles and Practice by Bram F. Noble, Oxford, 2009.
Activity	Reading and Class Discussion Read Chapter 2 of textbook
Module 3	**Engine Cycles**
Key Concepts	The basic cycles used in reciprocating internal combustion engines, both four stroke and two st The most common four-stroke SI and CI cycles are analyzed in detail using air-standard analys
Overview	

Aim	To develop an understanding and knowledge on the cycles of reciprocating internal combustio engines
Learning Outcomes	At the end of this module, students will be able to: • Analyse the basic air standard cycle • Compare between different types of air cycles
Units	Unit 3.1 Basic air standard cycles. Unit 3.2 OTTO Cycle Unit 3.3 Diesel Cycle Unit 3.4 Dual Cycle
Readings	
Activity	Reading and Class Discussion Read Chapter 3 of textbook
Module 4	**Thermochemistry and Fuels**
Key Concepts	Review the basic thermochemistry principles as applied to IC engines. It studies i characteristics and combustion in engines, the octane number of SI fuels, and the cetane nun CI fuels. Gasoline and other possible alternate fuels are examined
Overview	
Aim	To learn the basic thermochemistry principles as applied to IC engines.
Learning Outcomes	At the end of this module, students will be able to: • Understand the octane number of SI fuels • Understand the cetane number of CI fuels
Units	Unit 4.1: Chemical reaction and equilibrium Unit 4.2: Hydrocarbon components Unit 4.3: Self ignition and octane number
Readings	

Activity	Reading and Class Discussion Read Chapter 4 of textbook Midterm Exam
Module 5	**Air and Fuel Induction**
Key Concepts	Intake systems of engines
Overview	
Aim	Learning how air and fuel are delivered into the cylinders.
Learning Outcomes	At the end of this module, students will be able to: • Identify different types of Fuel injectors • Differentiate between superchargers and turbo chargers • Realise the importance of fuel injection timing
Units	Unit 5.1 Fuel injectors Unit 5.2 Superchargers Unit 5.3 Turbochargers
Readings	
Activity	Reading and Class Discussion Read Chapter 5 of textbook
Module 6	**Combustion**
Key Concepts	Waste classification, minimization, processing, recycling, recovery, landfill, incineration, Disposal, ground water contamination
Overview	
Aim	Understand air, fuel, and exhaust gas motion that occurs within the cylinders during the comp stroke, combustion, and power stroke of the cycle.

Learning Outcomes	At the end of this module, students will be able to: • understand the normal desired turbulence for complete combustion • Examine the combustion process in IC engines • Differentiate between combustion in SI and CI engines
Units	Unit 6.1 Turbulence Unit 6.2 Swirl Unit 6.3 Combustion in SI engines Unit 6.4 Combustion in CI engine
Readings	
Activity	Reading and Class Discussion Read Chapter 7+8 of textbook Group classwork Term project submission
Module 7	**Emissions and Air Pollution**
Key Concepts	Explore the undesirable emissions generated in the combustion process of automobile and ot engines
Overview	
Aim	Recognize that emissions pollute the environment and contribute to global warming, acid rain, odors, and respiratory and other health problems.
Learning Outcomes	At the end of this module, students will be able to: • Explore the undesirable emissions generated in the combustion • Identify the major causes of emissions in IC engines

Units	Unit 7.1 Air Pollution Unit 7.2 Hydrocarbons Unit 6.3 Carbon Monoxide Unit 6.4 Nitrogen Oxides
Readings	
Activity	Reading and Class Discussion Read Chapter 9 of textbook
Module 8	**Friction and Lubrication**
Key Concepts	Friction refers to the forces acting between mechanical components due to their relative moti to the forces on and by fluids when they move· through the engine
Overview	
Aim	Examines the friction that occurs in an engine and the lubrication needed to minimize this fricti
Learning Outcomes	At the end of this module, students will be able to: • Understand Mechanical friction and lubrication • Analyze the engine lubrication system • Recognize lubricating oils
Units	Unit 8.1 Mechanical friction Unit 8.2 Forces on Piston Unit 8.3 Lubricating Oils Unit 8.4 Oil Filters
Readings	
Activity	Reading and Class Discussion Read Chapter 10 of textbook

	Final Exam

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number: 0802391

Instructional Materials for Children
University of Jordan, Faculty of Educational Sciences, Department of Curriculum and Instruction
Fall Semester, 2014/2015

Instructor Information

Instructor: Dr. Diala Hamaidi, Assistant Professor
Office Location: Department of Curriculum and Instruction

Telephone: Office – :(962)-6-5355000 ext. 24591
Office Hours: S,T,Th (10:00am-11:00am)
E-mail: dhamaidi@nmsu.edu
Website: http://www.ju.edu.jo/sites/academic/dHamaidi/default.aspx

Course Identification

Course Number: 0802391
Course Name: Instructional Materials for Children
Course Location: Department of Curriculum and Instruction
Class Times: S,T, Th 1:00pm – 2:00pm
Prerequisites: _
Faculty Web Page: http://educational.ju.edu.jo/ar/arabic/Home.aspx

Course Description/Overview

Identifies educational materials for children, their importance, sources and types, Choosing ready – made materials according to appropriate criteria and identifying their uses in the classroom. Students will learn to design needed materials which promote children's thinking abilities such as classification, sorting, numbers, special relations, measurement, time, causality… etc. Emphasis is also placed on designing materials in ways that enhance children's total development and also to judge the efficiency of the produced learning materials.

Course Learning Objectives

The students will be able to:

- Identify the meaning of instructional materials for young children (Specifically, kindergarteners)
- Describe the wide variety of instructional materials that can be used in teaching young children

- Reflect on a field visit of Jordanian kindergartens' instructional materials
- Discuss the link between educational theories (Behavioral theory, Constructive theory) and choosing specific instructional materials.
- Design a thematic unit and its related instructional materials (2 sections: theoretical part and practical part)

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO1 & LO2: express their own understanding of instructional materials and search different web sites to provide examples of different instructional materials that they can use in their future teaching)

LO3: Make a presentation in front of his or her classmates in which they will respond to a guideline that was distributed to the whole class regarding a field visit for one of the Jordanian kindergartens (could be private or public). In this presentation the student will describe the physical and emotional environment with a focus on describing the existed instructional materials there. Every student will provide evidence of that visit (could be pictures, drawing, crafts, …)

LO4: Role play and present their understanding of theorists who reflect the constructive theory such as Piaget and Vygotsky, Behavioral theory (such as: Skinner). They will focus on their understanding of the implementation of each theory in the kindergarten and the relationship between the specific theorist and choosing the suitable instructional materials that reflect that theory.

LO5: Choose a specific theme based on the children developmental characteristics (the discussion in the class and the references will help them choose their favorite theme). After choosing the theme the students design a complete unit that includes a theoretical part (the idea behind choosing the theme, the long-term objectives of the unit, the short-term objectives, the activities, instructional materials that will help to achieve these objectives, and the assessment of those objectives) and a practical part (designing a variety of instructional materials that reflect the objectives and show an evidence that their work is designed by themselves. They will provide crafts, real materials, hands-on activities,…)

Course Resources

Course Website(s)

- http://www.be.free.infor/parents/Ar/childprotocolpa.htm
- http://www.ascd.org/portal/site/ascd/menuitem.2a5fd0d2211ffffddeb3ffdb62108n
- http://www.cec.sped.org/Content/NavigationMenu/Froiessinna1Development/Frcfeusi
- onalStandards/EthicsPracriceStandards/default.htm
- http://www.aera.net
- http://www.educationsector.org/analysis/analysis_show.htm?doc.id=374565%20
- http://www.eschoolnews.org/news.org/news/showStoryts.cfm?ArticleID=6376
- http://www.edu.gov.on.ca/eng/curriculum/elementary/kindergarten.html
- http://www.children.gov.on.ca/CS/en/programs/BestStart/default.htm
- http://news.com.com/Parents-shaky+about+kids+safety+onlime/2009-1025_3610428.html

Required Course Texts and Materials

- **Instructional materials for young children (2007).**

Optional Course Texts and Materials

7. Kritchevsky, S & Prescott. E. (1990) Planning Environment for young children NAEYC. Washington D.C.

8. Lasky, L. & Mukerji, R. (1990) Art Basic for young children. NAEYC. Washington D.C.
9. Allen, R. & Hart, B. The Early ears, Arrangements for learning prentic Hall 1989.
10. Schickedan & Forsyth. Toward understanding children. Little Brown comp. 1990.
11. Day, B. Early childhood Ed. Creative Learning Activities Macmillan Pub. Com. 1988.
12. Good, R. How children learn science. MacMillan Pub. Com. 1997.

Assignments and Grading Scheme

Grading System

LO1 &LO2: Search different web sites to provide examples of different instructional materials.

LO3: Make a presentation (Rubric is attached)

LO4: Role play presentation (Rubric is attached)

LO5: Designing thematic unit with related instructional materials (Rubric is attached)

Grading System

Historical Role Play : Educational Theories (LO4)

Teacher Name: **Dr. Hamaidi**

Student Name: _____

CATEGORY	5	4	3	2

Historical Accuracy	All historical information appeared to be accurate and in chronological order.	Almost all historical information appeared to be accurate and in chronological order.	Most of the historical information was accurate and in chronological order.	Very little of the historical information was accurate and/or in chronological order.
Role	Point-of-view, arguments, and solutions proposed were consistently in character.	Point-of-view, arguments, and solutions proposed were often in character.	Point-of-view, arguments, and solutions proposed were sometimes in character.	Point-of-view, arguments, and solutions proposed were rarely in character.
Knowledge Gained	Can clearly explain several ways in which his character \"saw\" things differently than other characters and can clearly explain why.	Can clearly explain several ways in which his character \"saw\" things differently than other characters.	Can clearly explain one way in which his character \"saw\" things differently than other characters.	Cannot explain one way in which his character \"saw\" things differently than other characters.

Oral Presentation Rubric : Field Visit: Kindergarten Instructional Materials (LO3)

Teacher Name: **Diala Hamaidi**

Student Name: _____

CATEGORY	**5**	**4**	**2**	**1**

Enthusiasm	Facial expressions and body language generate a strong interest and enthusiasm about the topic in others.	Facial expressions and body language sometimes generate a strong interest and enthusiasm about the topic in others.	Facial expressions and body language are used to try to generate enthusiasm, but seem somewhat faked.	Very little use of facial expressions or body language. Did not generate much interest in topic being presented.
Stays on Topic	Stays on topic all (100%) of the time.	Stays on topic most (99-90%) of the time.	Stays on topic some (89%-75%) of the time.	It was hard to tell what the topic was.
Content	Shows a full understanding of the topic.	Shows a good understanding of the topic.	Shows a good understanding of parts of the topic.	Does not seem to understand the topic very well.
Time-Limit	Presentation is 5-6 minutes long.	Presentation is 4 minutes long.	Presentation is 3 minutes long.	Presentation is less than 3 minutes OR more than 6 minutes.

LO1 &LO2 Class discussion of students' search.

Final Project Presentation: LO5

CATEGORY	**25-21**	**20-16**	**15-11**	**10-0**

Resources / Assessment - 30%	Theme is clear and appropriate to the grade level. Goes along with the Mass. Curriculum Framework.	Theme is clear but not quite appropriate to the grade level. Goes along with the Mass. Curriculum Framework.	Theme is clear but not appropriate to the grade level. Does not go along with the Mass. Curriculum Framework.	Theme is not clear and not appropriate to the grade level. Does not go along with the Mass. Curriculum Framework.
Integrated Study - 20%	The unit includes other disciplines integrated into the lessons with a focus on science and math.	The unit only shows some integration but focuses mostly on math and science.	The unit includes very little materials and resources.	The unit does not contain any materials used or maybe only a short list of them.
Resources / Assessment - 20%	Covers topic in-depth with details and examples. Subject knowledge is excellent.	Includes essential knowledge about the topic. Subject knowledge appears to be good.	Includes essential information about the topic but there are 1-2 factual errors.	Content is minimal OR there are several factual errors.
Mechanics / Organization - 10%	Project is submitted in a plastic file box which includes a binder of lessons as well as materials to support lesson. It will	Project submitted in file box and is mostly well organized. It includes lessons and supporting material. It is computer generated.	Project lacks organization and is missing materials. May not be submitted in correct format. Some things may not be typed.	Project has no organization and is not submitted in the correct format. The project may be missing materials / excessive errors.
Oral Presentation - 20%	Interesting, well-rehearsed with smooth delivery that holds audience attention.	Relatively interesting, rehearsed with a fairly smooth delivery that usually holds audience attention.	Delivery not smooth, but able to hold audience attention most of the time.	Delivery not smooth and audience attention lost.

Grading Policy

Grades can be based on the following: (Example)

Assignments	20%
Exams (1 midterm +1 Final)	70%
Class attendance/Activity participation	10%
Total Points	100

Course Policies

Late Assignments

If you pass the due date your final grade of the assignment will be affected. 5% will be deducted from the late assignment.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than three classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class.

Dissability

Appropriate accommodations will be provided for students who have self-identified in the office of Services for Students with Disabilities. If you have, or believe you have a disability, you may wish to self-identify.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1	14/9/2014	• Instructor and Students [Presentation: Know each other] • Schedule & Syllabus Review [Lecture] ▪ Next Class [Announcements] 21/9 ▪ Search online websites: meaning of instructional materials for young children
2	21/9	Instructional materials resourses
3	28/9	Designing instructional materials, Ways and methods of utili instructional materials: aproaches to ESD
4	12/10	Class discussion of students' search Chapter1: Textbook (Examples of Instructional Materials) Group discussion – Whole class discussion Ch.2: Textbooks: Criteria of choosing Instructional materials
5	19/10	Benefits of Instructional materials: Discussion of the following article from: Cone of Experience / Edgar Dale http://www.khayma.com/education-technology/w5.htm http://www.bhteachersbh.com/forum/new.php?print=1&id=2791 Kritchevsky, S & Prescott. E. (1990) Planning Environment for young children NAEYC. Washington D.C. Presentations of Field Visit Assignment Presentation continue …
6	26/10	presentation continue to build a solid foundation of what is existed in the Jordanian kindergartens

7	2/11	Ch.4: Educational Theories: PowerPoint Presentation: Whole Class discussion regarding each theory and its implementations on choosing instructional materials Skinner, Piaget, Vygotsky, Pruner, Ausubel, Bloom Taxonomy http://www.4uarab.com/vb/showthread.php?t=55885 faculty.ksu.edu.sa/74637/441/التعلم20%نظريات.doc http://educationaden.50webs.com/Ausubel.pdf faculty.ksu.edu.sa/ualturki/Documents/التعلم20%نظريات1.ppt *Other related links*
8	9/11	Educational Theories: Role Play Presentations Group Presentation *Historical Role Play : Educational Theories (LO4)*
9	16/11	Implementations of Educational Theories in classrooms Introduction: Designing Thematic Unit (Instructor presentation of previous examples)
10	23/11	Midterm Exam: 25/03/2012 Search: Kindergarteners' Developmental Characteristics Students' Search
11	30/11	Designing Thematic Unit (Instructor presentation of previous examples)
12	7/12	How to design the theoretical part of the thematic units Review Jordanian Kindergarten curriculum Interactive Kindergarten Curriculum
13	14/12	Designing the practical part of the thematic units

		How to design hands-on activities and experiences that cover the following domains: Knowledgeable aspect (cover all content areas that are introduced in KG Curriculum and match the developmental aspects of kindergarteners) Social and emotional aspect Physical aspect
14-16	21-28/12	Final Project presentations

Course	• Instructional Materials for the Young Child

Module 1	Overview of Instructional Materials in Early Childhood Education
Key Concepts	▪ meaning of instructional materials for young children ▪ Examples of Instructional Materials
Overview	This module introduces the students to the wide variety of instructional materials that can be used in teaching young children in early childhood settings. Designing instructional materials, Ways and methods of utilizing instructional materials: approaches to Education for Sustainable Development (ESD)
Aim	This module aimed at guiding students to express their own understanding of the variety of instructional materials: types and resources. During this model the students will search different web sites to provide examples of different instructional materials that they can use in their future teaching.
Learning Outcomes	At the end of this module learners will be able to: • Identify the meaning of instructional materials for young children (Specifically, kindergarteners) • Describe the wide variety of instructional materials that can be used in teaching young children • Reflect on a field visit of Jordanian kindergartens' instructional materials
Units	Chapter1: Textbook (Examples of Instructional Materials) Ch.2: Criteria of choosing Instructional materials
Readings	Benefits of Instructional materials: Discussion of the following article from: Cone of Experience / Edgar Dale http://www.khayma.com/education-technology/w5.htm http://www.bhteachersbh.com/forum/new.php?print=1&id=2791

	Kritchevsky, S & Prescott. E. (1990) Planning Environment for young children NAEYC. Washington D.C.
Activity	Overview ▪ *Assignment 1 :* Search online websites: meaning of instructional materials for young children 1- Activity (1) (Examples of Instructional Materials) can be facilitated by Class discussion & Group discussion 2- Activity (2) field visits to Jordanian kindergartens' Learning Centers *After visiting schools the students will make:* ****Presentations of Field Visit Assignment* *Make a presentation in front of the classmates in which they will respond to a guideline that was distributed to the whole class regarding a field visit for one of the Jordanian kindergartens (could be private or public). In this presentation the student will describe the physical and emotional environment with a focus on describing the existed instructional materials there. Every student will provide evidence of that visit (could be pictures, drawing, crafts, …)*
Module 2	Educational Theories and their Implication on Designing Learning Materials
Key Concepts	Constructive theory: Piaget and Vygotsky, Behavioral theory (such as: Skinner). They will focus on their understanding of the implementation of each theory in the kindergarten and the relationship between the specific theorist and choosing the suitable instructional materials that reflect that theory.
Overview	The focus of this module will be on bridging the gap between theory and

	practice. The module will highlight the insights of theorists who reflect the constructive theory such as Piaget and Vygotsky, Behavioral theory (such as: Skinner). The module will focus on expanding the students' understanding of the implementation of each theory in the kindergarten and the relationship between the specific theorist and choosing the suitable instructional materials that reflect that theory.
Aim	The aim of this module is to 1- understand the main tenets of each theory 2- understand the link between educational theories (Behavioral theory, Constructive theory) and choosing specific instructional materials.
Learning Outcomes	At the end of this module learners will be able to: • Explore the link between educational theories (Behavioral theory, Constructive theory) and choosing specific instructional materials.
Units	Ch.4: Educational Theories
Readings	• **Instructional materials for young children (2007).** • Skinner, Piaget, Vygotsky, Pruner, Ausubel, Bloom Taxonomy • http://www.4uarab.com/vb/showthread.php?t=55885 • *faculty.ksu.edu.sa/74637/441/التعلم20%نظريات.doc* • http://educationaden.50webs.com/Ausubel.pdf • *faculty.ksu.edu.sa/ualturki/Documents/التعلم20%نظريات1.ppt*
Activity	PowerPoint Presentation: Whole Class discussion regarding each theory and its implementations on choosing instructional materials

	Skinner, Piaget, Vygotsky, Pruner, Ausubel, Bloom Taxonomy http://www.4uarab.com/vb/showthread.php?t=55885 faculty.ksu.edu.sa/74637/441/نظريات%20التعلم.doc http://educationaden.50webs.com/Ausubel.pdf faculty.ksu.edu.sa/ualturki/Documents/نظريات%20التعلم1.ppt Role play and present their understanding of theorists who reflect the constructive theory such as Piaget and Vygotsky, Behavioral theory (such as: Skinner). They will focus on their understanding of the implementation of each theory in the kindergarten and the relationship between the specific theorist and choosing the suitable instructional materials that reflect that theory.
Module 3	Designing Thematic Unit
Key Concepts	Implementations, Educational Theories in classrooms Introduction, Designing Thematic Unit
Overview	How to design the theoretical part of the thematic units Review Jordanian Kindergarten curriculum Interactive Kindergarten Curriculum. Designing the practical part of the thematic units. How to design hands-on activities and experiences that cover the following domains: Knowledgeable aspect (cover all content areas that are introduced in KG Curriculum and match the developmental aspects of kindergarteners). Social and emotional aspect. Physical aspect
Aim	Designing thematic unit with related instructional materials (Rubric is attached)
Learning Outcomes	At the end of this module learners will be able to: - Demonstrate an understanding designing thematic units related to ESD - Design a thematic unit and its related instructional materials (2 sections:

	theoretical part and practical part
Units	Ch. 5
Readings	• **Instructional materials for young children (2007).**
Activity	(Instructor will provide a presentation of previous examples) Choose a specific theme based on the children developmental characteristics (the discussion in the class and the references will help them choose their favorite theme). After choosing the theme the students design a complete unit that includes a theoretical part (the idea behind choosing the theme, the long-term objectives of the unit, the short-term objectives, the activities, instructional materials that will help to achieve these objectives, and the assessment of those objectives) and a practical part (designing a variety of instructional materials that reflect the objectives and show an evidence that their work is designed by themselves. They will provide crafts, real materials, hands-on activities,…)
	Assignment 1: Generating Themes 29. Consider one of the indicated themes of this module. 30. Next explain the modalities of its implementation 31. Explain which impact it has en SD? 32. Next consider whether this theme is important at the national and local level of your country

Course	• Instructional Materials for the Young Child
Module 1	Overview of Instructional Materials in Early Childhood Education
Key Concepts	▪ meaning of instructional materials for young children ▪ Examples of Instructional Materials
Overview	This module introduces the students to the wide variety of instructional materials that can be used in teaching young children in early childhood settings. Designing instructional materials, Ways and methods of utilizing instructional materials: approaches to Education for Sustainable Development (ESD)
Aim	This module aimed at guiding students to express their own understanding of the variety of instructional materials: types and resources. During this model the students will search different web sites to provide examples of different instructional materials that they can use in their future teaching.
Learning Outcomes	At the end of this module learners will be able to: • Identify the meaning of instructional materials for young children (Specifically, kindergarteners) • Describe the wide variety of instructional materials that can be used in

	teaching young children • Reflect on a field visit of Jordanian kindergartens' instructional materials
Units	Chapter1: Textbook (Examples of Instructional Materials) Ch.2: Criteria of choosing Instructional materials
Readings	Benefits of Instructional materials: Discussion of the following article from: Cone of Experience / Edgar Dale http://www.khayma.com/education-technology/w5.htm http://www.bhteachersbh.com/forum/new.php?print=1&id=2791 Kritchevsky, S & Prescott. E. (1990) Planning Environment for young children NAEYC. Washington D.C.
Activity	Overview ▪ *Assignment 1 :* Search online websites: meaning of instructional materials for young children 3- Activity (1) (Examples of Instructional Materials) can be facilitated by Class discussion & Group discussion 4- Activity (2) field visits to Jordanian kindergartens' Learning Centers *After visiting schools the students will make:* ****Presentations of Field Visit Assignment* *Make a presentation in front of the classmates in which they will respond to a guideline that was distributed to the whole class regarding a field visit for one of the Jordanian kindergartens (could be private or public). In this presentation the student will describe the physical and emotional environment with a focus on describing the existed instructional materials there. Every student will*

	provide evidence of that visit (could be pictures, drawing, crafts, …)
Module 2	Educational Theories and their Implication on Designing Learning Materials
Key Concepts	Constructive theory: Piaget and Vygotsky, Behavioral theory (such as: Skinner). They will focus on their understanding of the implementation of each theory in the kindergarten and the relationship between the specific theorist and choosing the suitable instructional materials that reflect that theory.
Overview	The focus of this module will be on bridging the gap between theory and practice. The module will highlight the insights of theorists who reflect the constructive theory such as Piaget and Vygotsky, Behavioral theory (such as: Skinner). The module will focus on expanding the students' understanding of the implementation of each theory in the kindergarten and the relationship between the specific theorist and choosing the suitable instructional materials that reflect that theory.
Aim	The aim of this module is to 3- understand the main tenets of each theory 4- understand the link between educational theories (Behavioral theory, Constructive theory) and choosing specific instructional materials.
Learning Outcomes	At the end of this module learners will be able to: • Explore the link between educational theories (Behavioral theory, Constructive theory) and choosing specific instructional materials.

Units	Ch.4: Educational Theories
Readings	• **Instructional materials for young children (2007).** • Skinner, Piaget, Vygotsky, Pruner, Ausubel, Bloom Taxonomy • http://www.4uarab.com/vb/showthread.php?t=55885 • *faculty.ksu.edu.sa/74637/441/نظريات%20التعلم.doc* • http://educationaden.50webs.com/Ausubel.pdf • *faculty.ksu.edu.sa/ualturki/Documents/نظريات%20التعلم1.ppt*
Activity	PowerPoint Presentation: Whole Class discussion regarding each theory and its implementations on choosing instructional materials Skinner, Piaget, Vygotsky, Pruner, Ausubel, Bloom Taxonomy http://www.4uarab.com/vb/showthread.php?t=55885 *faculty.ksu.edu.sa/74637/441/نظريات%20التعلم.doc* http://educationaden.50webs.com/Ausubel.pdf *faculty.ksu.edu.sa/ualturki/Documents/نظريات%20التعلم1.ppt* Role play and present their understanding of theorists who reflect the constructive theory such as Piaget and Vygotsky, Behavioral theory (such as: Skinner). They will focus on their understanding of the implementation of each theory in the kindergarten and the relationship between the specific theorist and choosing the suitable instructional materials that reflect that theory.
Module 3	Designing Thematic Unit
Key Concepts	Implementations, Educational Theories in classrooms Introduction, Designing Thematic Unit
Overview	How to design the theoretical part of the thematic units

	Review Jordanian Kindergarten curriculum Interactive Kindergarten Curriculum. Designing the practical part of the thematic units. How to design hands-on activities and experiences that cover the following domains: Knowledgeable aspect (cover all content areas that are introduced in KG Curriculum and match the developmental aspects of kindergarteners). Social and emotional aspect. Physical aspect
Aim	Designing thematic unit with related instructional materials (Rubric is attached)
Learning Outcomes	At the end of this module learners will be able to: - Demonstrate an understanding designing thematic units related to ESD - Design a thematic unit and its related instructional materials (2 sections: theoretical part and practical part
Units	Ch. 5
Readings	• **Instructional materials for young children (2007).**
Activity	(Instructor will provide a presentation of previous examples) Choose a specific theme based on the children developmental characteristics (the discussion in the class and the references will help them choose their favorite theme). After choosing the theme the students design a complete unit that includes a theoretical part (the idea behind choosing the theme, the long-term objectives of the unit, the short-term objectives, the activities, instructional materials that will help to achieve these objectives, and the assessment of those objectives) and a practical part (designing a variety of instructional materials that reflect the objectives and show an evidence that their work is designed by themselves. They will provide crafts, real materials, hands-on activities,…)
	Assignment 1: Generating Themes

	33. Consider one of the indicated themes of this module. 34. Next explain the modalities of its implementation 35. Explain which impact it has en SD? 36. Next consider whether this theme is important at the national and local level of your country

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Managerial Economics

The University of Jordan, the School of Business, Department of Business Economics

Instructor Information

Instructor: Dr. Mohammad Alawin

Office Location: The School of Business / Business Economics Department -Building #1 First Floor.

Telephone: 5355000 ext.

Office Hours: 12-1 Sun, Tue, Thur.

E-mail: m.alawin@ju.edu.jo

Course Identification

Course Number: 1607421
Course Name: Managerial Economics
Course Location: Building #2/ Business School
Class Times: 9-10
Prerequisites: 1607210 and 1607211
Faculty Web Page: http://business.ju.edu.jo

Course Description/Overview

Economic theory is the fundamental determinant of firms' profitability and growth, and economic thinking should be an essential element in nearly every managerial decision. In this course, we will examine the principles of microeconomics, and show how they apply to managerial decision-making.

Course Learning Objectives

16. To equip the student with the principles he or she needs to make sense out of the conflicting and contradictory discussions of economic conditions and policies in newspapers and news magazines.
17. Enable the student to evaluate the performance of decision makers, and to predict the impact of their policy actions on families and business.
18. Understand and predict the economic forces shaping real-world business decisions.
19. Develop and strengthen overall analytical skills.

Develop critical thinking skills about markets and business decisions.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

LO **1- Knowledge and Understanding:**

- Understand managerial behavior regarding maximizing the profit of the firm under different market structure.
- Understand managerial reaction concerning government policy and activities.
- Understand mathematical methods (Derivative, linear programming), and statistical techniques (regression – model) to help managers taking optimal decisions.

LO **2- Analytical and Thinking Skills**:

Students should have the ability to:

- Present written and/or oral reports using critical thinking, economic data, and economic theory.
- Perform mathematics, and statistical knowledge and its application on economic- decision of the firms.
- Comprehend and communicate data presented graphically and/or mathematically.
- relate mathematical and statistical models to their assumptions and to the real world.

LO **3- Teaching and Learning Methods**:

Lectures, case studies, problem solving and tutorials.

- Lectures: 7 weeks, 21 hours
- Discussion forums: 7 weeks, 21 hours
- Tutorials: 2 weeks, 6 hours
- Applications (office hours): as requested

Course Resources

There will be 3 lectures per week. Although the lectures cover the vast majority of the module material, students must make use of the textbooks extensively especially the empirical cases presented in the book.

Course Website(s)

-

Required Course Texts and Materials

(Managerial Economics) 10th edition, 2011. *McGraw Hill* By: Thomas and Maurice.

.Optional Course Texts and Materials

- Nick Hanley, Jason Shogren, and Ben White, *Introduction to Environmental Economics*

Assignments and Grading Scheme

Grading System

A , A- Excellent
B+ , B, B- Very good
C+, C, C- Good

D+ , D, D- pass
D-, F = Fail

Grading Policy

Students will be assessed based on the following:

Mid-term Exam	30%
Second exam	15%
Participation	5%
Final Exam	50%

Assignments are individual assignments. Details of these assignments and the submission deadlines will be announced in class.

Course Policies

University Policies regarding class attendance, course pre-requisites, and academic honesty, grading, incompletes, and final exams will be observed as stated in the University of Jordan. You are responsible for all material discussed in class and assigned in the textbook. Missing class is strongly discouraged. Your professor is far less sympathetic to those who miss class regularly. If you miss class, you are responsible to get the notes from a classmate.

Any type of academic misconduct will result in (F). By Enrolling in this course, you agree with the University of Jordan Policy on Academic Misconduct.

Course Schedule

Detailed lecture schedule			
	Week:	Material:	Homework and Assignments
	Week 1	Ch (1): Managers, Profits and Markets(2-28)	TBA
	Week 2+3	Ch (2): Demand, Supply, & Market Equilibrium (36-64).	TBA
	Week 4	Ch (6): Elasticity and Demand (204-229)	TBA
	Week 5+6+7	Ch (3): Marginal Analysis for Optimal Decision Making(86-108) Ch (7): Demand Estimation & Forecasting(243-262)	TBA
	Week 8+9	Ch (8+9): Production and Cost in the Short (284-312),and long Runs (320-359),	TBA
	Week 10	Ch (10): Production and Cost Estimation (371-377)	
	Week 11+12	Ch (11): Managerial Decisions in Competitive Markets (398-441)	TBA

	Week 13+14	Ch (12): Managerial Decisions for Firms with Market Power. (453-478)	TBA
	Week 15	Linear programming	
	Week 16	Final exam	TBA

Course	• Instructional Materials for the Young Child
Module 1	Overview of Instructional Materials in Early Childhood Education
Key Concepts	▪ meaning of instructional materials for young children ▪ Examples of Instructional Materials
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Aim	This module aimed at guiding students to express their own understanding of the variety of instructional materials: types and resources. During this model the students will search different web sites to provide examples of different

	instructional materials that they can use in their future teaching.
Learning Outcomes	At the end of this module learners will be able to: • Identify the meaning of instructional materials for young children (Specifically, kindergarteners) • Describe the wide variety of instructional materials that can be used in teaching young children • Reflect on a field visit of Jordanian kindergartens' instructional materials
Units	Chapter1: Textbook (Examples of Instructional Materials) Ch.2: Criteria of choosing Instructional materials
Readings	Benefits of Instructional materials: Discussion of the following article from: Cone of Experience / Edgar Dale http://www.khayma.com/education-technology/w5.htm http://www.bhteachersbh.com/forum/new.php?print=1&id=2791 Kritchevsky, S & Prescott. E. (1990) Planning Environment for young children NAEYC. Washington D.C.
Activity	Overview ▪ *Assignment 1 :* Search online websites: meaning of instructional materials for young children 5- Activity (1) (Examples of Instructional Materials) can be facilitated by Class discussion & Group discussion 6- Activity (2) field visits to Jordanian kindergartens' Learning Centers *After visiting schools the students will make:*

	****Presentations of Field Visit Assignment* *Make a presentation in front of the classmates in which they will respond to a guideline that was distributed to the whole class regarding a field visit for one of the Jordanian kindergartens (could be private or public). In this presentation the student will describe the physical and emotional environment with a focus on describing the existed instructional materials there. Every student will provide evidence of that visit (could be pictures, drawing, crafts, …)*
Module 2	Educational Theories and their Implication on Designing Learning Materials
Key Concepts	Constructive theory: Piaget and Vygotsky, Behavioral theory (such as: Skinner). They will focus on their understanding of the implementation of each theory in the kindergarten and the relationship between the specific theorist and choosing the suitable instructional materials that reflect that theory.
Overview	The focus of this module will be on bridging the gap between theory and practice. The module will highlight the insights of theorists who reflect the constructive theory such as Piaget and Vygotsky, Behavioral theory (such as: Skinner). The module will focus on expanding the students' understanding of the implementation of each theory in the kindergarten and the relationship between the specific theorist and choosing the suitable instructional materials that reflect that theory.
Aim	The aim of this module is to 5- understand the main tenets of each theory 6- understand the link between educational theories (Behavioral theory, Constructive theory) and choosing specific instructional materials.

Learning Outcomes	At the end of this module learners will be able to: • Explore the link between educational theories (Behavioral theory, Constructive theory) and choosing specific instructional materials.
Units	Ch.4: Educational Theories
Readings	• **Instructional materials for young children (2007).** • Skinner, Piaget, Vygotsky, Pruner, Ausubel, Bloom Taxonomy • http://www.4uarab.com/vb/showthread.php?t=55885 • *faculty.ksu.edu.sa/74637/441/التعلم20%نظريات.doc* • http://educationaden.50webs.com/Ausubel.pdf • *faculty.ksu.edu.sa/ualturki/Documents/التعلم20%نظريات1.ppt*
Activity	PowerPoint Presentation: Whole Class discussion regarding each theory and its implementations on choosing instructional materials Skinner, Piaget, Vygotsky, Pruner, Ausubel, Bloom Taxonomy http://www.4uarab.com/vb/showthread.php?t=55885 *faculty.ksu.edu.sa/74637/441/التعلم20%نظريات.doc* http://educationaden.50webs.com/Ausubel.pdf *faculty.ksu.edu.sa/ualturki/Documents/التعلم20%نظريات1.ppt* Role play and present their understanding of theorists who reflect the constructive theory such as Piaget and Vygotsky, Behavioral theory (such as: Skinner). They will focus on their understanding of the implementation of each theory in the kindergarten and the relationship between the specific theorist and choosing the suitable instructional materials that reflect that theory.

Module 3	Designing Thematic Unit
Key Concepts	Implementations, Educational Theories in classrooms Introduction, Designing Thematic Unit
Overview	How to design the theoretical part of the thematic units Review Jordanian Kindergarten curriculum Interactive Kindergarten Curriculum. Designing the practical part of the thematic units. How to design hands-on activities and experiences that cover the following domains: Knowledgeable aspect (cover all content areas that are introduced in KG Curriculum and match the developmental aspects of kindergarteners). Social and emotional aspect. Physical aspect
Aim	Designing thematic unit with related instructional materials (Rubric is attached)
Learning Outcomes	At the end of this module learners will be able to: - Demonstrate an understanding designing thematic units related to ESD - Design a thematic unit and its related instructional materials (2 sections: theoretical part and practical part
Units	Ch. 5
Readings	• **Instructional materials for young children (2007).**
Activity	(Instructor will provide a presentation of previous examples) Choose a specific theme based on the children developmental characteristics (the discussion in the class and the references will help them choose their favorite theme). After choosing the theme the students design a complete unit that includes a theoretical part (the idea behind choosing the theme, the long-term objectives of the unit, the short-term objectives, the activities, instructional materials that will help to achieve these objectives, and the

	assessment of those objectives) and a practical part (designing a variety of instructional materials that reflect the objectives and show an evidence that their work is designed by themselves. They will provide crafts, real materials, hands-on activities,…)
	Assignment 1: Generating Themes 37. Consider one of the indicated themes of this module. 38. Next explain the modalities of its implementation 39. Explain which impact it has en SD? 40. Next consider whether this theme is important at the national and local level of your country

Course	**Managerial Economics**
Module 1	**Introduction to Managerial Economics**
Key Concepts	Introduction Managers, Profits and Markets
Overview	We try to explain the accounting concepts in the area of microeconomics and industrial organization such as: Business practices (or) tactics, Industrial organization, Strategic Decisions In addition, we will go over some concepts related to Economic Cost of Using Resources such as: Opportunity cost, market-supplied resources, owner-supplied resources, Total economic cost, explicit costs, implicit costs, economic profit, and accounting profit.
Aim	The aim of this module is to make students able to apply microeconomic theories to business problems
Learning	At the end of this module learners will be able to:

Outcomes	- Discuss the economic way of thinking about business. - Measuring and maximizing economic profit - Understand Separation of ownership and control.
Units	Unit 1: Managers, Profits and Markets.
Readings	(Managerial Economics) 11th edition, 2013. *McGraw Hill* By: Thomas and Maurice.
Activity	**Overview**
	Students should be able to answer the following questions: - Explain the role of economic theory in managerial economics? - Measure the explicit opportunity cost of using market-supplied resources to produce goods or services. - Over the next three years, a firm is expected to earn economic profit of $700,000 in the first year, $800,000 in the second year, and $500,000 in the third year. After the end of the third year, the firm goes out of business. a. If the risk-adjusted discount rate is 16 percent for each of the next three years, how much the value of the firm will be? b. If the risk-adjusted discount rate is 10 percent for each of the next three years, then, how much the value of the firm will be?

Module 2	(Demand, Supply, and Market Equilibrium) and (Elasticity of Demand)
Key Concepts	(Demand, Supply, and Market Equilibrium) and (Elasticity of Demand)
Overview	- In this part, students will work with three different types of demand relations: general, direct, and inverse demand functions. - We will List six principal variables that determine the quantity demanded of a good, and another six principal variables that determine the quantity supplied. - Distinguish between changes in "quantity demanded" (i.e., a movement along demand) and changes in "demand" (i.e., a shift in the demand curve) - Explain why market equilibrium occurs at the price for which quantity demanded equals quantity supplied (i.e., neither excess demand nor excess supply exist). - Employ the concepts of consumer surplus, producer surplus, and social surplus to measure the gains to society from market exchange between buyers and sellers. - Explain the role that price elasticity plays in determining how a change in the price of a commodity affects the total revenue (TR = P × Q) received. - List and explain several factors that affect the elasticity of demand. - Calculate the elasticity of demand (a) over an interval using the interval (or arc) formula, and (b) at a point on a demand curve. - Define and compute the income elasticity of demand (EM) and the cross-price elasticity of demand (EX Y). - Relate marginal revenue to total revenue and demand elasticity.
Aim	The main goal is to understand the role of demand and supply in affecting the equilibrium of the market. In addition, a one should know how he/she will response (presented by the quantity purchased of one good) to changes in price of that good, income, and the price of related goods.
Learning	At the end of this module learners will be able to:

Outcomes	- Explain the determinants of Supply and demand and understanding the meaning of equilibrium of the market. - Explain how price elasticity of demand (E) is used to measure the responsiveness or sensitivity of consumers to a change in the price of a good.
Units	Unit 2: Demand, Supply, and Market Equilibrium Unit 6: Elasticity of Demand
Readings	(Managerial Economics) 11th edition, 2013. *McGraw Hill* By: Thomas and Maurice.
Activity	**Overview**
	Construct two models: The first one is for the demand of one good (explaining the factors that determine the relationship with it). The second model shows the determinants of supply of that good (explaining the relationships of these determinants with that good).

Module 3	**(Demand Estimation and Forecasting)**
Key Concepts	Demand Estimation, Demand Forecasting, least-squares regression
Overview	- In this part, students will work on specifying an empirical demand function—both linear and nonlinear functional forms. - Forecast sales and prices using time-series regression analysis.

	- Employ dummy variables to account for cyclical or seasonal variation in sales.
Aim	- After reading and understanding this chapter, students should be able to: - For price-setting firms with market power, we will learn to how to use least-squares regression methodology to estimate a firm's demand function. - Discuss and explain several important problems that arise when using statistical methods to forecast demand. -
Learning Outcomes	At the end of this module learners will be able to: forecast the demand on one good.
Units	- Unit 7: Demand Estimation and Forecasting
Readings	(Managerial Economics) 11th edition, 2013. *McGraw Hill* By: Thomas and Maurice.
Activity	**Overview**
	Construct a model for the demand of one good (explaining the factors that determine the relationship with it). Then collecting data on these variables. Finally, performing how to forecast that model.

Module 4	**Production and Cost in the Short-Run and the Long-Run**
Key Concepts	production, cost, short run, long run
Overview	In this part, students should be able to: - Understand the information given by a production function. - Explain the difference between long-run and short-run production time periods. - Define and explain the law of diminishing marginal product. - Explain the difference between fixed costs and variable costs. - Define and draw graphs of total fixed cost (TFC), total variable cost (TVC), total cost (TC), and short-run marginal cost (SMC). - Define and draw graphs of average fixed cost (AFC), average variable cost

	(AVC), and average total cost (ATC). - Draw a graph of a typical production isoquant and use the definition of an isoquant to explain why isoquants must be downward sloping. - Construct isocost curves for a given level of expenditure on inputs. - Construct an expansion path. - Define and illustrate graphically the concept of returns to scale. - Construct a long-run total cost curve from an expansion path. - Define economies of scope and explain how to measure economies of scope. - Show the relation between long-run and short-run cost curves.
Aim	The main goal is to understand the role - Compute average product (AP) and marginal product (MP) and explain the relation among total, average, and marginal products. - Apply the theory of optimization to find the optimal input combination. - Show graphically that the conditions for minimizing the total cost of producing a given level of output are the same conditions for maximizing the level of output for a given level of total cost.
Learning Outcomes	At the end of this module learners will be able to: - Compare and contrast technical efficiency and economic efficiency. - Relate short-run costs to the production function using the relations between (i) average variable cost and average product, and (ii) short-run marginal cost and marginal product. - Discuss the properties of an isoquant. - Explain the concept of economies and diseconomies of scale.
Units	Unit 7: Production and Cost in the Short-Run Unit 8: Production and Cost in the Long-Run
Readings	(Managerial Economics) 11th edition, 2013. *McGraw Hill* By: Thomas and Maurice.
Activity	**Overview**

	Collecting data for a commercial company about its of production and cost levels. Try to isolate fixed and variable costs. Draw all data in useful figures.

Module 5	**(Marginal Analysis for Optimal Decisions)**
Key Concepts	
Overview	In this part, students will work with the following economic concepts: marginal analysis, net benefit, the choice variables (continuous or discrete), marginal benefit, and how to formulate an optimization problem
Aim	The main goal is to understand how to employ marginal analysis to find the optimal levels of activities in unconstrained maximization problems.
Learning Outcomes	At the end of this module learners will be able to: - Explain why sunk costs, fixed costs, and average costs are irrelevant for determining the optimal levels of activities. - Employ marginal analysis to find the optimal levels of two or more activities in constrained maximization and minimization problems.
Units	Unit 3: Marginal Analysis for Optimal Decisions
Readings	(Managerial Economics) 11th edition, 2013. *McGraw Hill* By: Thomas and Maurice.
Activity	**Overview**

Module 6	**(Economic Growth, Technology and Greenhouse Gas Emissions)**
Key Concepts	
Overview	- In this part, students will work with economic models that include climate change variables. In addition, we will go over the essential concepts about that subject.
Aim	The main goal is to understand the role - Understand the climate change problem
Learning Outcomes	At the end of this module learners will be able to: – Build a simple growth model that includes the climate change variable.
Units	Unit 4: Economic Growth, Technology
Readings	*The Economics of Climate Change: A Primer*. US Congressional Budget Office, 2003
Activity	**Overview**

Course Syllabus

0905371 Fuel and Energy

University of Jordan, Faculty of Engineering & Technology,
Chemical Engineering Department
First Semester, 2014-2015

Instructor Information

Instructor:	Prof.Yahia Al-Khraisha
Office Location:	University Campus, Engineering Building, 2nd Floor
Office Telephone:	+962 6 535 5000
Office Hours:	12:00-1:00 Sun Tue Thurs
E-mail:	khraisha@ju.edu.jo
Faculty Website:	http://www2.ju.edu.jo/sites/Academic/

Course Identification

Course Number:	0905371
Course Name:	Fuel and Energy
Course Location:	University Campus
Class Times:	11:00-12:00 Sun Tue Thurs
Prerequisites:	0905343 Process Heat Transfer

Course Description/Overview

Energy classification, sources and utilization. Non-renewable Energy: Fossilfuels, Nuclear energy, hydrogen fuel. Fossil-fuel systems and applications, wasteheat recovery systems. Renewable Energy: solar energy, wind power, tidal power,geothermal energy, and Biofuels. Energy storage: chemical storage, thermal storage and fuel cells. Energy and the Environment.

Course Objectives

The overarching goals of this course are providing students with knowledge and understanding of the fundamentals of fuel and energy science and engineering. These are important to chemical engineers since they need to deal with energy as a major utility in the chemical process industry. Moreover, many chemical engineers work in power plants or the energy conversion industry.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

7. Classify and describe energy sources and specify their potentials.
8. Analyze existing and proposed renewable and non-renewable energy systems.
9. Classify and describe the concepts of different types of energy conversion systems.
10. Describe the various types of energy storage.
11. Realize the general impacts of fuel use and energy processing on the environment.

Course Resources

Course Website(s)

Required Course Texts and Materials

2. Culp, A. W., "Principle of Energy Conversion", second edition, McGraw-Hill, 1991.
3. Hodge, B.K., "Alternative Energy Systems and Applications", John Wiley,2010.
4. Weston, K. C., "Energy Conversion", electronic edition, 2000, revised from the 1992 edition, West Publishing.
5. Boyle, G. and Everett, B. and Ramage, J., "Energy Systems and Sustainability", Oxford University Press, UK, 2003.

Optional Course Texts and Materials

2. Boyle, G., "Renewable Energy", Oxford University Press, UK, 2004.
3. Probstein, R.F., Hicks, R. E., "Synthetic Fuels", 2nd edition, Dover publications, 2006.
4. *Speight, J.G. '*The Chemistry and Technology of Petroleu*m', 3rd edition, Pennwell, 1999.*

http\\:

Grading System

0 to 100 (where 50 is the least pass mark)

Grading Policy

Grades are divided on the following evaluation tools:

Quizzes	10
Project	10
Midterm Exam	30
Final Exam	50
Total Points	**100**

Course Policy

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

All students are expected to attend all classes and should arrive on time.Students should maintain discipline and respect for others. They are expected to come prepared and participate actively in class discussion. According to University regulations, the maximum absence allowed is 15% of classes. Makeup exams may be given for accepted excuses only. No makeup for non-exam activities.

Course Schedule

Week	Date	Topics, Assignments and Deadlines (Details on assignments and bibliography are available in the course modules)
1		**Course Overview**

		Syllabus, Evaluation tools, Policy, Overview and Introduction
2		Energy Classifications, Sources and Utilization
3-6		Fossil Fuels: Coal, Petroleum, Natural gas
7-8		Synthetic Fuels & Nuclear fuel
9-12		Renewable energy: Solar, Wind Power , Geothermal energy, etc.
13		Combustion Calculations
14-15		Fossil Fuel systems and applications
16		Energy Storages

LEBANON LAU

Course Syllabus

Course Number: ENV 211

Conserving Biodiversity in a Changing Climate

Lebanese American University

Department of Natural Sciences

Fall 2014 Semester

Instructor Information

Instructor:	Prof. Dr. Ahmad Houri
Office Location:	Beirut campus, Sage 202
Telephone:	Office 961-786456 x1253
Office Hours:	MTW 11:00 – 1:00.
E-mail:	ahouri@lau.edu.lb
Website:	http://ahmad.houri.lau.edu.lb/

Course Identification

Course Number:	ENV 211
Course Name:	Conserving Biodiversity in a Changing Climate

Course Location:	Sage G01, Beirut Campus
Class Times:	MWF 10:00 – 11:00
Prerequisites:	none
Faculty Web Page:	http://sas.lau.edu.lb/natural-sciences/people/ahouri.php

Course Description/Overview

Students of the course will examine current conservation strategies in terms of their effectiveness in addressing changing risks under a changing climate and will learn to develop new and/or modified strategies where necessary to address these risks. Students will also learn to use methods and tools that can assess ecosystem responses to climate variability and change and thus guide the development of new/modified conservation strategies. Course topics include: The role of ecosystems and biodiversity in sustaining the planet and major stresses; traditional approaches to biodiversity conservation including legal and policy aspects as well as community scale strategies; effectiveness of traditional approaches; approaches to designing landscapes for protecting ecosystems and biodiversity under climate change; use of spatial analysis tools to guide landscape design; management strategies; policies and tools for protecting matrix areas; community participation; planning for long term monitoring and evaluation; and case study approaches to designing climate sensitive conservation strategies. Students will design a conservation plan that is sensitive to changing risks in a changing climate for a selected region.

Course Objectives

The overall aim of this course is to generate strategies for adapting biodiversity conservation to changing risks under a changing climate by using existing/ new/modified conservation approaches, either singly or in any combination thereof. Applicable legal and policy instruments, and accounting for the role of local communities will be taken into account.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able:

89. To develop an understanding of traditional approaches to biodiversity conservation and legal and policy instruments, which govern conservation at the international or national/regional/local levels

90. To evaluate the effectiveness of traditional conservation approaches in terms of their benefits and shortcomings and in their ability to address changing risks due to climate change
91. To determine goals and priorities for conservation under a changing climate
92. To develop new and/or modified strategies for protecting areas of conservation importance under a changing climate
93. To develop tools and plans for the long term monitoring of protected areas to ensure the effectiveness of conservation strategies

Course Resources

Required Course Texts and Materials

- Climate Change and Biodiversity. Thomas E. Lovejoy, Lee Hannah. Yale University Press, 2005.
- Millennium Ecosystem Assessment (2005). *Ecosystems and Human Well-being: Synthesis*. Island Press, Washington, DC.
- Managing Protected Areas: A Global Guide. M. Lockwood, G. L. Worboys and A. Kothari (Eds.), Earthscan, London, UK and Sterling, USA.

Optional Course Texts and Materials

- Battarbee, R., P. Cox, C. Freeman, J. Lawton, G. Mace, A, Mackay, D. Read and J. Shepherd (2007). Biodiversity-Climate interactions: adaptation, mitigation and human livelihoods, Report of an international meeting held at the Royal Society 12-13 June 2007, Royal Society, UK
  Available: http://royalsociety.org/document.asp?tip=0&id=6830
- Mainka, S. A., McNeely, J. A. and Lackson, W. J. (Posted March 11, 2008) Depending on nature: ecosystem services for human livelihoods, Heldref Publications, March/April 2008
  Available: http://www.redorbit.com/news/science/1290207/depending_on_nature_ecosystem_services_for_human_livelihoods/
- Naughton-Treves, L., Buck Holland, M. and Brandon, K. (2005). The role of protected areas in conserving biodiversity and sustaining local livelihoods, *Annual Review of the Environment and Resources,* 30: 219-252.
- L. Hansen, J. Biringer and J. Hoffman, (Eds.), *Buying Time: A User's Manual for Building Resistance and Resilience to Climate Change in Natural Systems*, WWF, Washington.

- Hopkins, J. J., Allison, H. M., Walmsley, C. A., Gaywood, M. and Thurgate, G. 2007. *Conserving Biodiversity in a Changing Climate: guidance on building capacity to adapt,* DEFRA, United Kingdom
- J. Terborgh, C.V Schaik, L. Davenport and M. Rao (eds), *Making Parks Work: Strategies for Preserving Tropical Nature*, Island Press, Washington DC
- Goldman, Mara (2003). Partitioned nature, privileged knowledge: Community-based conservation in Tanzania. *Development and Change* 34(5); pp. 833-862.
- Balint, P.J. (2006). Improving community-based conservation near Protected Areas. The importance of development variables. *Environmental Management* 38(1); pp. 137-148.
- Cambell, L.M. and A. Vainio-Mattila (2003). Participatory development and community-based conservation. Opportunities missed for lessons learned. *Human Ecology* 31(3); pp. 417-437.
- Baldus, R.D., Kaggi, D.Th. and Ngoti, P.M. (2004). Community based conservation: Where are we now? Where are we going?' *Miombo,* **27**, 3-7.

Assignments and Grading Scheme

Grading System

0 to 100 (where 60 "D" is the passing grade)

Grading Policy

Grades are based on the following:

Debate/presentation	5%
3 exams	90%
Class attendance/participation	5%
Total Points	**100**

Course Policies

Classroom Protocol

POLICY ON CHEATING AND PLAGIARISM

Students caught cheating on an exam receive a grade of zero on the exam in their first cheating attempt and receive a warning. Students caught cheating for the second time will receive a grade of "F" in the course and another warning. Plagiarism on assignments and project work is a serious offense. If plagiarism is detected, a student will be subject to penalty, similar to the cheating case, which ranges from receiving a zero on the assignment concerned to an "F" in the course in addition to a warning.

ATTENDANCE POLICY

1. Students are held responsible for all the material presented in the classroom, even during their absence.
2. Students can miss no more than the equivalent of five weeks of instruction and still receive credit for that course.
3. Instructors have the right to impose specific attendance regulations in their courses, provided that the above-stated limit of absences is not exceeded, and the minimum number of absences allowed is no fewer than the equivalent of two weeks of classroom instruction, after the Drop and Add period.
4. Instructors will inform the Departments Chairperson and the Guidance Office, of any prolonged unexplained absence.
5. Students who exceed the allowed number of absences must withdraw from the course; otherwise, the course grade will be recorded as "F" (NP).

WITHDRAWAL POLICY

"Students wishing to withdraw from one or more courses must follow the withdrawal procedure provided by the Registrar's Office. Students withdrawing from courses after the late registration period and before the withdrawal deadline will receive Ws for all the courses in progress."
Deadline for withdrawal from courses (WI): Oct 22, 2014 (It is the student's responsibility to drop the course)

COURSE ONLINE EVALUATIONS

Completion of the online course evaluations is required. Students will not be able to access their course grades until they have completed the course evaluations.

Course Schedule

Major Topics Covered in the Course and Tentative Schedule

1. Underlying need for protecting ecosystems and conserving biodiversity
2. Current biodiversity conservation strategies and their effectiveness
3. Protecting ecosystems and conserving biodiversity under a changing climate
4. Case Study: Designing conservation strategies for addressing climate impacts in a selected region

Detailed topics:

Week 1&2- Need for protecting ecosystems and conserving biodiversity

Week 3&4- Traditional approaches to biodiversity conservation

Week 6- Effectiveness of traditional approaches against various stressors

Week 6&7- Approaches to designing conservation responses that address climate change risks

Week 8- Designing landscapes

Week 9- Management of protected areas

Week 10- Protecting the matrix areas

Week 11- Community inclusive approaches

Week 12- Monitoring the effectiveness of adaptive strategies

Week 13 & 14- Case Study: Designing conservation strategies for addressing climate impacts in a selected region

Course Module

Course	Conserving Biodiversity in a Changing Climate
Module 1	**Underlying Need for Protecting Ecosystems and Conserving Biodiversity**
Key Concepts	Ecosystems, sustainability, endemism, endangered species, climatic and non-climatic stresses.
Overview	This module will briefly review the material covered in ENV210 on the role of ecosystems in the provision of goods and services and thus in sustaining the planet and supporting human development. An understanding of areas of high species endemism including endangered species and landscapes will be developed. Major stresses on ecosystems and biodiversity and their observed impacts over the past 50 years and potential impacts in the future will be discussed.
Aim	Understand the importance of Ecosystems and Biodiversity and learn the stresses that affect them.
Learning Outcomes	• Understand the concept of ecosystems goods and services and the role of ecosystems in supporting human development • Learn about the importance of areas of high endemic biodiversity • Learn about major climatic and non-climatic stresses, including those with anthropogenic origins, that affect ecosystem functioning and threaten biodiversity • Become familiar with major stresses that affect ecosystems and biodiversity
Units	1.1 Need for protecting ecosystems and conserving biodiversity
Readings	• Millennium Ecosystem Assessment (2005). Summary for decision-makers. In Ecosystems and Human Well-being: Synthesis. Island Press, Washington, DC, pp. 1-24. • Millennium Ecosystem Assessment (2005). Summary for decision-

	makers. In Ecosystems and Human Well-being: Biodiversity Synthesis. Island Press, Washington, DC, pp. 1-16. • Battarbee, R., P. Cox, C. Freeman, J. Lawton, G. Mace, A, Mackay, D. Read and J. Shepherd (2007). Biodiversity-Climate interactions: adaptation, mitigation and human livelihoods, Report of an international meeting held at the Royal Society 12-13 June 2007, Royal Society, UK Available: http://royalsociety.org/document.asp?tip=0&id=6830 • Mainka, S. A., McNeely, J. A. and Lackson, W. J. (Posted March 11, 2008) Depending on nature: ecosystem services for human livelihoods, Heldref Publications, March/April 2008. Available: http://www.redorbit.com/news/science/1290207/depending_on_nature_ecosystem_services_for_human_livelihoods/
Activity	**Video**
	Watch a documentary about one ecosystem with endemic and endangered species, showing its goods and services, the stresses affecting it and the need to conserve it.
Module 2	**Current Biodiversity Conservation Strategies and their Effectiveness**
Key Concepts	CBD, protected areas, IUCN, CBNRM, sustaining livelihoods
Overview	Students will learn about strategies and methods that are commonly employed for the conservation of biodiversity. International treaties, agreements and laws applicable to the protection of ecosystems and biodiversity will also be discussed. The extent of success of currently utilized strategies in meeting their objectives will be examined.
Aim	Learn the strategies and methods used for the conservation of biodiversity
Learning Outcomes	• Learn about international treaties and agreements, most importantly the convention on biological diversity (CBD), and will

	develop an idea of actions taken at regional/national/local scales. • Understand the concepts of in-situ and ex-situ conservation • Develop an understanding of place based conservation methods i.e. protected areas and learn about protected area categories based the World Conservation Union (IUCN) classification • Learn about the global distribution of protected areas • Learn about the traditional role of communities in protected area management, the diverse kinds of community efforts as well as popular approaches to community engagement such as the Community Based Natural Resource Management (CBNRM) strategies • Learn about the effectiveness of current protected area systems in protecting ecosystems and biodiversity against various stressors and therefore in supporting human development • Become aware of some of the key challenges in maintaining protected areas • Understand the strengths and weaknesses of traditional approaches to conservation, including in the context of climate change impacts
Units	2.1 Traditional approaches to biodiversity conservation 2.2 Effectiveness of traditional approaches against various stressors
Readings	• Lockwood, M (2006) Global protected area framework. In, M. Lockwood, G. L. Worboys and A. Kothari (Eds.), *Managing Protected Areas: A Global Guide,* Earthscan, London, UK and Sterling, USA, pp. 73-100 • Lockwood, M (2006) Social Context. In, M. Lockwood, G. L. Worboys and A. Kothari (Eds.), *Managing Protected Areas: A Global Guide,* Earthscan, London, UK and Sterling, USA, pp. 41-72

	• Borrini-Feyerabend, G., Johnson, J. and Pansky, D (2006) Governance of protected areas. In, M. Lockwood, G. L. Worboys and A. Kothari (Eds.), *Managing Protected Areas: A Global Guide,* Earthscan, London, UK and Sterling, USA, pp. 116-145 • Kothari, A. (2006). Community conserved areas. In, M. Lockwood, G. L. Worboys and A. Kothari (Eds.), *Managing Protected Areas: A Global Guide,* Earthscan, London, UK and Sterling, USA, pp. 549-573 • Naughton-Treves, L., Buck Holland, M. and Brandon, K. (2005). The role of protected areas in conserving biodiversity and sustaining local livelihoods, Annual Review of the Environment and Resources, 30: 219-252. • Dudley, N. and Stolton, S. (2003). Ecological and Socio-economic benefits of protected areas in dealing with climate change. In L. Hansen, J. Biringer and J. Hoffman, (Eds.), Buying Time: A User's Manual for Building Resistance and Resilience to Climate Change in Natural Systems, WWF, Washington. Pp. 215-231. • Worboys, G., Winkler, C. and Lockwood, M. (2006) Threats to protected areas. In, M. Lockwood, G. L. Worboys and A. Kothari (Eds.), Managing Protected Areas: A Global Guide, Earthscan, London, UK and Sterling, USA, pp. 223-261 • Lockwood, M., Worboys, G. L. and Kothari, A. (2006) Challenges and opportunities. In, M. Lockwood, G. L. Worboys and A. Kothari (Eds.), Managing Protected Areas: A Global Guide, Earthscan, London, UK and Sterling, USA, pp. 677-681
Activity	**Short presentations by students**
	The students will research and give a short presentation on several treaties, conventions and unions such as CBD, IUCN and CBNRM explaining their missions, methods and actions taken.
Module 3	**Protecting Ecosystems and Conserving Biodiversity under a Changing**

	Climate
Key Concepts	Conservation strategies, changing climate, local versus regional context, protected area management, cost effective strategies, key stakeholders, monitoring.
Overview	This module will be devoted to understanding the manner in which response strategies can be designed to address the impacts of climate change on ecosystems and biodiversity in addition to the impacts of other pre-existing stressors as well as any synergistic outcomes. Each sub-module will address a key step in the process of designing conservation strategies suited to a more dynamic environment and students will be given the opportunity to participate in case study exercises aimed at conservation planning for selected regions.
Aim	Design conservation strategies under a changing climate using key guiding principles and various analytical tools. Learn the importance of monitoring the effectiveness of adapted strategies and develop a system to monitor the designed strategies.
Learning Outcomes	• Learn about key guiding principles to designing climate change responsive conservation strategies e.g. conserving existing biodiversity; reducing the impacts of non-climatic stressors; protecting and restoring habitats and maintaining habitat 29 • connectivity; relying on analytical evidence to guide decision-making; and integrating adaptation and mitigation efforts (from Hopkins et al, 2007) • Learn to use these guidelines to set broad conservation goals and priorities for their local/regional areas, keeping in mind institutional, legal and governance aspects. • Learn about various modeling methods for determining climate change impacts on ecosystems and species and therefore on conservation targets (e.g. regional climate projections, modeling

	changes in species distribution, species range shift models, etc.) • Based on these methods learn to determine future changes in conservation targets, keeping in mind the synergistic interactions of climate change impacts with non-climatic stressors • Learn to determine the future distribution and boundaries of protected areas, including the importance of maintaining landscape connectivity • Understand the need for a dynamic conservation plan in response to current and projected future distribution of species under a changing climate and informed by reserve planning tools (e.g. reserve selection algorithms) • Understand the role of planning and management in protected area design and conservation • Learn to evaluate current management tools in terms of their long-term applicability under a changing climate • Understand the importance of spatial coordination • Identify key stakeholders and their roles • Understand the need for planning and regulatory tools that can address climatic and non-climatic stressors and can maintain flexibility and reversibility as risks change with a changing climate • Identify additional costs in terms of staff, resources, training, and equipment needs. • Learn about the key role of the matrix as a source of biodiversity, as a source of resources for species, as a connective landscape, and as a potential suitable habitat for species under a changing climate. • Learn to apply analytical methods and tools to determine the current and future functions of matrix areas in biodiversity conservation

	• Understand the importance of periodic monitoring of climate induced changes as well as changes in other stressors in matrix areas, which are often under various land uses • Learn about the various options for protecting matrix areas to preserve their structure and function • Be informed about policy and regulatory approaches to protecting matrix areas • Evaluate traditional and current community conservation strategies in terms of their applicability for conservation under a changing climate • Identify other community stakeholders that could potentially play a role in biodiversity conservation under climate change • Identify current land-uses by local communities in areas that might need protection for biodiversity conservation under climate change and the ways in which these land uses can be made compatible with conservation objectives (are social appraisal tools like participatory rural appraisal useful here?) • Evaluate the usefulness of popular approaches such as the CBNRM in aiding community participation for biodiversity conservation under climate change • Identify policy and regulatory measures as well as incentives that could be used to elicit community cooperation and participation • Understand the importance of monitoring for effective conservation planning to address a changing climate • Understand the basics of designing a monitoring system that produces the desired results and is cost-effective • Learn to determine what must be monitored i.e. focus on key target species, processes and resources • Learn to select eco-regions or landscapes that must be monitored

	• Learn to determine the frequency of monitoring required • Learn to use various methods and tools for this purpose e.g. spatial analysis, survey methods, etc.
Units	3.1 Approaches to designing conservation responses that address climate change risks 3.2 Designing landscapes 3.3 Management of protected areas 3.4 Protecting the matrix areas 3.5 Community inclusive approaches 3.6 Monitoring the effectiveness of adaptive strategies
Readings	• Hopkins, J. J., Allison, H. M., Walmsley, C. A., Gaywood, M. and Thurgate, G. 2007. *Conserving Biodiversity in a Changing Climate: guidance on building capacity to adapt,* DEFRA, United Kingdom • Hannah, L., T. Lovejoy and S. Schneider (2005). Conservation with a changing climate. In T. Lovejoy and L. Hannah, eds., *Climate Change and Biodiversity*. Yale University, New Haven, pp. 325-328. • Price, M. F. and Neville, G. R. (2003). Designing strategies to increase the resilience of Alpine/Montane systems to climate change. In. L. J. Hansen, J. L. Biringer and J. R. Hoffman (Eds.), *Buying Time: A User's Manual for Building Resistance and Resilience to Climate Change in Natural Systems: Protected Areas,* World Wildlife Fund. Pp. 73-92 • Hannah, L., T. Lovejoy and S. Schneider (2005). Designing landscapes and seascapes for change. In T. Lovejoy and L. Hannah, eds., *Climate Change and Biodiversity*. Yale University, New Haven, pp. 329-341. • Hannah, L. (2003). Regional biodiversity impacts assessments for climate change: a guide for protected area managers. In L. Hansen, J. Biringer and J. Hoffman, eds., *Buying Time: A User's Manual for Building Resistance and Resilience to Climate Change in Natural Systems*, WWF, Washington. Pp. 233-242.

- Hannah, L. and Salm, R. (2005). Protected area management in a changing climate. In T. Lovejoy and L. Hannah (Eds.), Climate Change and Biodiversity. Yale University, New Haven, pp. 211-228.
- Lockwood, M. (2006) Management Planning. In, M. Lockwood, G. L. Worboys and A. Kothari (Eds.), Managing Protected Areas: A Global Guide, Earthscan, London, UK and Sterling, USA, pp. 292-327
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Activity	**Case study exercises (Unit 3.1), Visit to Shouf Cedar Reserve (Unit 3.3)**
	1- Design conservation strategies suited to a more dynamic environment in selected regions using principles and techniques learned in this module 2- Visit the Shouf Cedar Reserve and its headquarters to learn from their experience in managing protected areas.
Module 4	**Case Study: Designing Conservation Strategies for Addressing Climate Impacts in Selected Regions**
Key Concepts	Conservation plan, climate risks, integrated management plan, community participation strategies, periodic monitoring plan, cost effectiveness.
Overview	This module is designed as a hands-on activity where students will use the knowledge acquired from this course to design a conservation plan that is sensitive to changing risks under climate change for an area of their choice. Students will be expected to use the tools and resources provided in this course to develop their designs and must include all the key considerations, including the need for periodic monitoring. This exercise includes presentation of the conservation plans developed during this activity.
Aim	Hands on experience to design a conserving plan in a changing climate.
Learning Outcomes	• Identify broad goals and priorities • Identify climatic and non-climatic stressors, both current and

	future, and be able to determine potential future impacts in terms of changing species distribution and ranges • Identify matrix areas that important for future conservation needs • Assess the applicability of current conservation strategies in that region to address climate risks in future • Include a climate risk integrated management plan that considers future conservation landscapes, including matrix areas. • Identify key stakeholder roles, including community participation strategies • Identify policy/regulatory approaches • Include a periodic monitoring plan identifying key targets and landscapes to be monitored, monitoring frequency and methodology • Include an analysis of cost effectiveness
Units	Case Study: Designing Conservation Strategies for Addressing Climate Impacts in Selected Regions
Readings	All the readings from earlier modules are to be used as references
Activity	The module is an activity in itself.

Course Syllabus

Course Number: ENV 200

Introduction to Environmental Science

Lebanese American University, Department of Natural Sciences,

Fall 2014 Semester

Instructor Information

Instructor: Prof. Dr. Roy Khalaf

Office Location: Byblos campus, Block A, Room 820

Telephone: Office 961-9547264 x2216

Office Hours: MWF 8:45-10, TR: 9:30-10:30

E-mail: roy.khalaf@lau.edu.lb

Website:

Course Identification

Course Number: ENV 200

Course Name: Introduction to environmental Science

Course Location: Eng 506 Byblos Campus

Class Times: MWF 3-4

Prerequisites: none

Faculty Web Page: http://sas.lau.edu.lb/natural-sciences/people/roy-khalaf.php

Course Description/Overview

An introduction to the environmental problems and challenges facing mankind. Global problems will be directly related to issues facing the regional and local environment. The course covers environmental problems and their causes, ecosystems and how they work, deforestation, loss of biodiversity, species extinction, air pollution, global warming, ozone depletion, solid waste disposal, renewable

energy technologies and applications to alleviate environmental problems. Case studies will be presented and potential solutions will be attempted. The course also includes field trips.

Course Objectives

The objective of this course is to introduce the environment we live in to the students. The course will treat environmental science as an interdisciplinary study, combining ideas and information from natural sciences, such as biology and chemistry and social sciences such as economics, politics and ethics to present a general idea of how nature works and how things are interconnected. It will discuss problems affecting the environment and tries to offer solutions. The course stresses the important, but unfortunately sometimes harmful, role that man plays in shaping the environment and will attempt to install a sense of responsibility in each individual to live in harmony with- and not at the expense of- nature. The course aims at providing a better appreciation of the value of environmental conservation especially in Lebanon. This course should also motivate students to become active participants in presenting and evaluating environmental solutions to the problems we have created. This heightened sense of awareness will be achieved through lectures, hosting of keynote speakers, field trips and possible class debates.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

94. Understand the notion of food webs, food chains and energy cycles.
95. Understand the harmful role man plays in shaping the environment.
96. Identify the major environmental concerns of our world today and come up with potential solutions within financial and technological constraints.
97. Acquire practical experience by becoming familiar with places of special environmental interest in Lebanon.
98. Possess a heightened sense of ethics and morality in dealing with nature, or with people of other cultures and religions

Course Resources

Required Course Texts and Materials

Living in the Environment, G. Tyler Miller JR , Brooks/Cole, thirteenth edition

Optional Course Texts and Materials

- UN's Tunza Magazine
- Photographic Guide to Wild Flowers of Lebanon
- Ministry of Environment Web page**: www.moe.gov.lb**
- SELDAS book.
- Excerpts from newspapers, magazines, internet websites etc..
- Website for the book: www.brookscole.com/product/0534376975s

Assignments and Grading Scheme

Grading System

0 to 100 (where 60 "D" is the passing grade)

Grading Policy

Grades can be based on the following: (Example)

Debate/presentation	5%
3 exams	90%
Class attendance/participation	5%
Total Points	**100**

Course Policies

Classroom Protocol

POLICY ON CHEATING AND PLAGIARISM

Students caught cheating on an exam receive a grade of zero on the exam in their first cheating attempt and receive a warning. Students caught cheating for the second time will receive a grade of "F" in the course and another warning. Plagiarism on assignments and project work is a serious offense. If plagiarism is detected, a student will be subject to penalty, similar to the cheating case, which ranges from receiving a zero on the assignment concerned to an "F" in the course in addition to a warning.

ATTENDANCE POLICY

6. Students are held responsible for all the material presented in the classroom, even during their absence.
7. Students can miss no more than the equivalent of five weeks of instruction and still receive credit for that course.
8. Instructors have the right to impose specific attendance regulations in their courses, provided that the above-stated limit of absences is not exceeded, and the minimum number of absences allowed is no fewer than the equivalent of two weeks of classroom instruction, after the Drop and Add period.
9. Instructors will inform the Departments Chairperson and the Guidance Office, of any prolonged unexplained absence.
10. Students who exceed the allowed number of absences must withdraw from the course; otherwise, the course grade will be recorded as "F" (NP).

WITHDRAWAL POLICY

"Students wishing to withdraw from one or more courses must follow the withdrawal procedure provided by the Registrar's Office. Students withdrawing from courses after the late registration period and before the withdrawal deadline will receive Ws for all the courses in progress."
Deadline for withdrawal from courses (WI): Oct 22, 2014 (It is the student's responsibility to drop the course)

COURSE ONLINE EVALUATIONS

Completion of the online course evaluations is required. Students will not be able to access their course grades until they have completed the course evaluations.

Important Dates to Remember

Course Schedule

Major Topics Covered in the Course and Tentative Schedule

1. Introduction to Environmental systems
2. Ecology and sustainability
3. Sustaining Biodiversity
4. Sustaining Key resources
5. Sustaining Environmental Quality
6. Sustaining Human Societies

Detailed topics:

Week 1-Ecology and Ecosystems

Week 2-Evolution and Biodiversity

Week 3-Human Population

Week 4-Food Resources

Week 5-Water Resources

Week6-Nonrenewable and Renewable Energy Sources

Week 7-Air and Air Pollution

Week 8-Water Pollution

Week 9-Climate Change and Ozone Loss

Week 10-Biodiversity Loss: Example of Amphibian decline in Canada

Week 11-Ecotourism: Example from the Al-Jord project in Lebanon.

Week 12- Industrial Ecology

Week 13- Sustainable Development, Ecocities

Week 14- Societal, Political, and Ethical Solutions (an essay by the world renowned environmentalist, David Suzuki)

Course Module

Course	Introduction to Environmental Science
Module 1	Introduction to environmental systems, biodiversity and sustainability
Key Concepts	Ecology, evolution, biodiversity, sustainability
Overview	Instil in students key concepts in ecology, environmental science, biodiversity and evolution. An overview of energy cycles, trophic levels, food chains, food webs and ranges of tolerance will be discussed. Characteristics of different biomes and ecosystems and the type of biodiversity found will also be discussed. Concepts in Darwinism and Lamarckism, mutations, natural and artificial selection will be introduced. This module will also explain the concept of self-sustainability, stressing the adverse role man is playing.
Aim	Lay the background needed to better understand environmental issues
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss different ecosystems • Understand key concepts in evolution leading to biodiversity • Understand the concept of self-sustainability of nature
Units	Unit 1.1 Ecology and Ecosystems Unit 1.2: Evolution and Biodiversity
Readings	Living in the Environment, pages 64-109, 560-630 plus extra hand-outs
Activity	**None**

Module 2	Human population and Sustaining key resources
Key Concepts	Population, food resources, pollution,
Overview	This broad module will discuss human population growth and its effect on the environment. Human population growth has been said to be the single most devastating factor leading to biodiversity decline But is it? Is the problem just a numbers issue? Maybe it an issue of population distribution between the developing and the developed nations? Or maybe an issue that relates to our ever changing non sustainable lifestyle and ever increasing energy needs? This module will challenge students by asking existential questions about human population, civilization, and lifestyle. It will also discuss key environmental resources such as food, water, energy and subsequent pollution in light of the ever increasing demand and consumption by one overwhelming species-the human race .
Aim	The aim of this module is to understand the collective impact mankind is having on key environmental resources
Learning Outcomes	• At the end of this module students should be able to: • Understand the impact of human population growth on key environmental resources
Units	Unit 2.1: population growth Unit 2.2: food resources Unit 2.3: sustainable and non-sustainable energy resources Unit 2.4: air and air pollution

	Unit 2.3: water and water pollution
Readings	Living in the Environment pages 250-520 plus extra readings
Activity	**Overview** 1) A debate on genetically modified food will take place. Class will be divided into two sections, one arguing for and one against genetically modified foods. The debate will cover all aspects from the ethical to the effect on the economy, to human health, to biodiversity. 2) A trip to the water treatment plant in Dbayeh and then to Chabrouh Dam will be attempted.
Module 3	Climate change and ozone loss
Key Concepts	Global warming, CO_2, ozone, UV light, Antarctica
Overview	This module discusses the concept of global warming from an anthropogenic perspective. It stresses the effect that greenhouse gases-especially carbon dioxide from our ever increasing demand on non-renewable energy-are having on the planet. This module reminds students that the greenhouse effect-within a certain range-is actually a good thing and necessary for life. Ozone depletion resulting in increased UV radiation due to man-made CFC chemicals and their effect on human disease and health will also be discussed. This module also attempts to link both concepts, as an increase in global warming in the troposphere results in a colder stratosphere resulting in ozone loss

Aim	The aim here is to understand the role man is playing in both global warming and ozone depletion.
Learning Outcomes	At the end of this module learners will be able to: • Understand how human civilization is contributing to global warming • Understand that ozone loss and global warming are linked events
Units	Unit 3.1: Climate change and ozone loss
Readings	Living in the Environment pages 446-482 and extra readings
Activity	**Overview** Movie: An inconvenient truth, by Al Gore
Module 4	Sustaining human societies, ecocities, industrial ecology
Key Concepts	Ecotourism, sustainable development, eco-cities
Overview	The world population is expected to plateau at around 11 billion people. As such how can a limited number of resources sustain so many people? The answer is through a change in lifestyle, through sustainable development. Use as much resources as can be regenerated in a lifetime. This implies a combination of principles from ethical and moral issues to concepts of renewable energy. It entails preserving diversity, not only at the biological level, but at the level of cultures, races, and languages by empowering locals. This module discusses concepts in eco-cities / self-sustainable cities-such as Curitiba in Brazil, and examples of eco village projects, such as the Al Jord project in Lebanon. Sustainability not only applies to development, it can apply to tourism the world's largest industry where ecotourism can be an alternative to rampant mass tourism. Sustainability can also be part of industry; creating industrial ecology that aims to recycle industrial by-products in the same manner nature recycles resources and

	energy. The last part of this module discusses an essay by the world renowned Canadian environmentalist, David Suzuki which highlights the main reasons behind most of our environmental problems.
Aim	The aim here is to instil a holistic approach in students. To have them understand that everything in life is linked, that in the end the issue at hand is a moral issue. That in order for life as we know it to continue to exist, we need to change our way of thinking, our habits and our lifestyle, and in the end we will be the ones benefiting from such a change.
Learning Outcomes	At the end of this module learners will be able to: • Differentiate between eco-cities as smart growth versus urban sprawl , between mass tourism and ecotourism • understand the concept of industrial ecology
Units	Unit 3.1: Ecotourism and industrial ecology Unit 3.2: Sustainable development and eco-cities
Readings	Living in the Environment Pages 660-716 plus extra readings
Activity	**Overview**
	1) Movie: State of the Planet by David Attenborough 2) Presentations: 5' student presentation about sustainability and biodiversity.

RENEWABLE ENERGY FOR SUSTAINABLE DEVELOPMENT

Course Syllabus

Course Number: ENV 220

Lebanese American University

Department of Natural Sciences

Fall 2014 Semester

Instructor Information

Instructor:	Prof. Dr. Ahmad Houri
Office Location:	Beirut campus, Sage 202
Telephone:	Office 961-786456 x1253
Office Hours:	MTW 11:00 – 1:00.
E-mail:	ahouri@lau.edu.lb
Website:	http://ahmad.houri.lau.edu.lb/

Course Identification

Course Number:	ENV 220
Course Name:	Renewable Energy for Sustainable Development
Course Location:	Sage G01, Beirut Campus
Class Times:	MWF 10:00 – 11:00

Prerequisites: none
Faculty Web Page: http://sas.lau.edu.lb/natural-sciences/people/ahouri.php

Course Description/Overview

We live in an era of ever-rising oil prices, where economic development is strongly correlated with increasing energy use and levels of electrification rates. Economies are restricted by fluctuating energy supplies and put under pressure due to the burdens energy security puts on their national policies and strategic planning.

The importance of utilziation of smart renewable energy solutions helps economies and nations in achieving reliable energy supply at affordable costs and reduced negative environmental impact. The use of clean energy sources is on essential ingridient of sustainable economic development, enhancing the strength of the economy through providing green jobs, imrpocing energy supply, and protecting eco-tourism.

This course looks at renewable energy solutions as key component to developing economies and strenthening the capabilities of developing nations. It is designed to intriduce students to the issues of energy in the 21st century and their effects on the economy covering energy production and use from different perspectives including biology. Engineering, economics, climate science, and socio-economic science.

Course Learning Objectives

The overarching goals of this course are to:

a) provide a clear understanding of the critical role that energy plays in reshaping nation's economy;
b) present the different renewable energy technologies and their applicability for development;
c) establish a link between the development of nations and the utilization of renewable energy for electricity production; and
d) evaluate the environmental impact of energy produced through renewable and non-renewable sources.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

99. Understand the role of energy in the economy
100. Analyse the effect of fluctuating oil prices on the national economy
101. Understand the different renewable energy technologies and their applicability in different situation
102. Perform preliminary environmental impact assessment of energy sources
103. Perform a techno-economic analysis of renewable energy sources

Course Outline

- *Module 1: Introduction to Energy*
  - *Intro to energy*
  - *Conventional sources of energy*
  - *Energy and the environment*
  - *Future energy needs and consequences*
- *Module 2: Solar Energy*
  - *Basics of solar power*
  - *Solar thermal applications*
  - *Solar PV*
  - *Current trends and uses of solar energy*
  - *Solar energy environmental impact*
- *Module 3: Wind Energy*

    - *Intro to wind energy*
    - *Wind resources*
    - *Wind turbines*
    - *Wind turbines environmental impact*
- *Module 4: Ocean & Hydro Energy*
    - *Intro to ocean power*
    - *Wave energy technologies*
    - *Tidal energy applications*
    - *Osmotic power*
    - *Hydro power*
    - *Ocean & hydro environmental impact*
- *Module 5: Geothermal Energy*
    - *Geothermal resources*
    - *Shallow geothermal applications*
    - *Deep geothermal applications*
    - *Geothermal energy environmental impact*
- *Module 6: Biofuels*
    - *Intro to biofuels*
    - *First generation biofuels*
    - *Second generation biofuels*
    - *Biofuels environmental impact*
- *Module 7: Socio-economic Issues*
    - *Socio-economic impact of energy production and use*

- *Economics of energy*
- *Renewable energy in rural regions*
- *Lifecycle assessment of fossil and renewable fuels*

Course Resources

Course Website

Through the BlackBoard Learn platform

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class
- Fanchi, John R. "Energy in the 21st century" Hackensach, N.J." World Scientific, 2005
- Godfrey Boyle, " Renewable Energy, Power for a sustainable future", 2004, Oxford University Press
- REN 21, "Energy for Development", The Worldwatch Institute, 2005
  http://www.worldwatch.org/system/files/ren21-1.pdf
- DVD: Saved by the sun, produced by Steve Latham, Larry Klein, Evan I. Schwartz ; written by Larry Klein and Evan I. Schwartz ; directed by Steven Latham ; a Steven Latham production for WGBH/Nova ; WGBH Educational Foundation. WGBH Video, 2007
- The power of wind, produced by the American Wind Energy Association with the support of the U.S. Department of Energy. American Wind Energy Association (AWEA), 2005.

Optional Course Texts and Materials

- Bent Sorensen, "Renewable energy :its physics, engineering, use, environmental impacts, economy, and planning aspects" Elsevier Academic Press, 2004
- John Twidell, Tony Weir, Anthon D. Weir, "Renewable energy resources", Taylor & Francis, 2005

- Chiras, Daniel D. “The homeowner’s guide to renewable energy: achieving energy independence through solar, wind, biomass, and hydropower”

Assignments and Grading Scheme

Grading System

0 to 100 (where 60 is the least pass mark)

Grading Policy

Grades can be based on the following:

Quizzes/Assignments	30%	The best 6 out of 7 quizzes and assignments account for 30%
Exam	35%	Final exam covering all the material of the course accounting for 35%
Project	25%	Group project accounting for 25% of the final grade
Attendance/Discussion Forum	10%	Activeness in class discussions and discussion forums account for 10%
Total Points	100%	Final grade (60% minimum passing grade)

Course Policies

Classroom Protocol

POLICY ON CHEATING AND PLAGIARISM

Students caught cheating on an exam receive a grade of zero on the exam in their first cheating attempt and receive a warning. Students caught cheating for the second time will receive a grade of "F" in the course and another warning. Plagiarism on assignments and project work is a serious offense. If plagiarism is detected, a student will be subject to penalty, similar to the cheating case, which ranges from receiving a zero on the assignment concerned to an "F" in the course in addition to a warning.

ATTENDANCE POLICY

11. Students are held responsible for all the material presented in the classroom, even during their absence.
12. Students can miss no more than the equivalent of five weeks of instruction and still receive credit for that course.
13. Instructors have the right to impose specific attendance regulations in their courses, provided that the above-stated limit of absences is not exceeded, and the minimum number of absences allowed is no fewer than the equivalent of two weeks of classroom instruction, after the Drop and Add period.
14. Instructors will inform the Departments Chairperson and the Guidance Office, of any prolonged unexplained absence.
15. Students who exceed the allowed number of absences must withdraw from the course; otherwise, the course grade will be recorded as "F" (NP).

WITHDRAWAL POLICY

"Students wishing to withdraw from one or more courses must follow the withdrawal procedure provided by the Registrar's Office. Students withdrawing from courses after the late registration period and before the withdrawal deadline will receive Ws for all the courses in progress."
Deadline for withdrawal from courses (WI): Oct 22, 2014 (It is the student's responsibility to drop the course)

COURSE ONLINE EVALUATIONS

Completion of the online course evaluations is required. Students will not be able to access their course grades until they have completed the course evaluations.

COURSE GENERAL NOTES

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

This class requires students to attend classes, participate in webinars, contribute to the discussion forum, submit periodic assignments and projects, and sit for prescheduled exams. Students are expected to attend all classes and participate in the different activities of the course.

At the end of each module there is a quiz/assignment that tests student's understanding of the course objectives and their ability to demonstrate the knowledge acquired throughout the module. At the middle of the course students will be assigned a project (in groups), to be submitted during the last month of the courses. The final exam tests student's understanding of the course as a whole and includes concepts from the classes, discussion forums, assigned videos, and projects.

Course Schedule

Week	Module	Topics, Reading, Assignments and Deadlines
1	1	***Course Overview*** - Introduction to energy - Conventional sources of energy
2		- Energy and the environment - Future energy needs and consequences ***Quiz 1***
3	2	- Basics of solar power - Solar thermal applications - Solar PV
4		- Current trends and uses of solar energy - Solar energy environmental impact ***Assignment 1 (DVD)***
5	3	- Intro to wind energy - Wind resources
6		- Wind turbines - Wind turbines environmental impact ***Assignment 2 (DVD)***
7	4	- Intro to ocean power - Wave energy technologies
8		- Tidal energy applications - Osmotic power
9		- Hydro power - Ocean energy environmental impact ***Project Overview***

		Quiz 2
10	5	- Geothermal resources - Shallow geothermal applications
11		- Deep geothermal applications - Geothermal energy environmental impact ***Quiz 3***
12	6	- Intro to biofuels - First generation biofuels
13		- Second generation biofuels - Biofuels environmental impact ***Assignment 3 (Webinar)***
14	7	- Socio-economic impact of energy production and use - Economics of energy
15		- Renewable energy in rural regions - Lifecycle assessment of fossil and renewable fuels ***Quiz 4***
16		***Presentation of Project*** ***Final Exam***

Course	Renewable Energy for Development
Module 1	**Introduction to Energy**
Key Concepts	Energy, renewable vs nonrenewable energy, energy and climate change
Overview	This module provides students with basic background about energy and its correlation with economic development. It presents the conventional sources of energy and their impact on the environment and the economic standing of nations. Questions answered in this module: • How is energy produced globally? • What effect does this have on the environment? • What are the current trends in energy production? • How does the future look?
Aim	This introductory module aims at providing students with essential background on energy systems and provide a good introduction to renewable energy
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss the different sources of energy • Understand the impact of energy consumption on the environment • Have a good idea about current and future global energy trends
Units	Unit 1.1 Intro to energy Unit 1.2 Conventional sources of energy Unit 1.3 Energy and the environment Unit 1.4 Future energy needs and consequences
Readings	Fanchi, John R. "Energy in the 21st century" Hackensach, N.J." World Scientific, 2005 (Chapters 1-4)

Activity	**Quiz** *A 20-minute quiz to test students understanding of energy systems and their ability to analyse energy-related graphs and figures.*
Module 2	**Solar Energy**
Key Concepts	Solar energy, solar EIA, solar PV, solar heating
Overview	This module presents the first and most common renewable energy technology, solar energy. It presents the different electrical and thermal applications of solar power and their role in clean energy generation to reduce large amounts of carbon emissions as compared to conventional technologies. Questions answered in this module: • How is solar energy used to generate electricity? • What makes solar energy a feasible solution? • How solar electricity achieves economic development? • How does solar really sustain the environment?
Aim	This module aims at giving the student the required information about solar thermal and electric applications.
Learning Outcomes	At the end of this module learners will be able to: • Understand the different solar energy applications • Compare different applications and understand their applicability • See the environmental impact of utilizing solar energy
Units	Unit 2.1 Basics of solar power Unit 2.2 Solar thermal applications Unit 2.3 Solar PV Unit 2.4 Current trends and uses of solar energy Unit 2.5 Solar energy environmental impact
Readings	Godfrey Boyle, " Renewable Energy, Power for a sustainable future", 2004, Oxford

	University Press (Chapters 1 & 2)
Activity	**Assignment** *Watch the DVD "Saved by the sun" produced by Steve Latham, and submit an essay with personal perception and analysis.*
Module 3	**Wind Energy**
Key Concepts	Wind Energy, wind EIA, wind resource assessment, wind turbines
Overview	The module discusses wind energy applications covering small scale as well as large wind farm scale. Studding the practicality and impact of wind turbines on the environment and surrounding community. Questions answered in this module: • How can wind be used to produce electricity? • What are the different applications of wind energy? • How is wind resource assessment performed? • What positive and negative impacts do wind turbines have on the environment?
Aim	This module aims at giving the student the required information about wind energy and how it can contribute to economic development.
Learning Outcomes	At the end of this module learners will be able to: • Understand the different wind energy applications • Compare different applications and understand their applicability • See the environmental impact of utilizing wind energy
Units	Unit 3.1 Intro to wind energy Unit 3.2 Wind resources Unit 3.3 Wind turbines Unit 3.4 Wind turbines environmental impact

Readings	Godfrey Boyle, " Renewable Energy, Power for a sustainable future", 2004, Oxford University Press (Chapter 7)
Activity	**Assignment** *Watch the DVD "The power of wind produced by the American Wind Energy Association and submit an essay with personal perception and analysis.*
Module 4	**Ocean & Hydro Energy**
Key Concepts	Hydro power, wave energy, tidal energy, osmotic power
Overview	This module gets into water, presenting the renewable sources of electricity including hydro power and ocean power including wave, tidal, and osmotic. Ocean biomass is not discussed in this module as it is covered under the biofuels module. Questions answered in this module: • How is water used to generate electricity? • What are the main applicable technologies in harnessing ocean power? • How do these technologies affect the environment?
Aim	This module aims at giving the student the required information about ocean power and hydroelectric applications. Allowing students to differentiate between different technologies and assess the pros and cons of each application.
Learning Outcomes	At the end of this module learners will be able to: • Understand the different water related energy applications • Compare different applications and understand their applicability • See the environmental impact of utilizing ocean and hydro power
Units	Unit 4.1 Intro to ocean power Unit 4.2 Wave energy technologies Unit 4.3 Tidal energy applications

	Unit 4.4 Osmotic power Unit 4.5 Hydro power Unit 4.6 Ocean & hydro environmental impact
Readings	Godfrey Boyle, " Renewable Energy, Power for a sustainable future", 2004, Oxford University Press (Chapters 5, 6, 8)
Activity	**Quiz** *A 20-minute quiz to test students understanding of ocean and hydro power systems. It includes basic technological issues but more economic and environmental related questions.*
Module 5	**Geothermal Energy**
Key Concepts	Geothermal, shallow geothermal, deep geothermal, geothermal assessment
Overview	This module introduces geothermal applications for electricity and thermal power generation. Deep as well as shallow geothermal applications are discussed including resource assessment, applicability, roles in developing communities, and environmental impact. Questions answered in this module: • How are geothermal resources assessed? • What are main geothermal applications? • How do these technologies affect the environment?
Aim	This module aims at giving the student the required information about geothermal applications for water heating and electricity generations. Allowing students to differentiate between different technologies and assess the pros and cons of each application.
Learning Outcomes	At the end of this module learners will be able to: • Understand the different geothermal energy applications • Compare different applications and understand their applicability

	• See the environmental impact of geothermal projects
Units	Unit 5.1 Geothermal resources Unit 5.2 Shallow geothermal applications Unit 5.3 Deep geothermal applications Unit 5.4 Geothermal energy environmental impact
Readings	Godfrey Boyle, " Renewable Energy, Power for a sustainable future", 2004, Oxford University Press (Chapter 9)
Activity	**Quiz** *A 20-minute quiz to test students understanding of geothermal applications. It includes a case study that requires students to propose the most practical geothermal solution and perform basic economic and environmental feasibility.*
Module 6	**Biofuels**
Key Concepts	Biofuels, bioenergy, biogas
Overview	This module presents different biofuels classified into first generation biofuels such as ethanol, biogas, syngas, green diesel, biodiesel, and many others, and second generation biofuels made from lignocellulosic biomass or woody crops. Questions answered in this module: • How can energy be produced from living organisms? • What are first generation biofuels? • What are second generation biofuels? • How sustainable are biofuels?
Aim	This module goes deep into different biofuels produced from living organisms and biomass products. Students will learn about various sources of energy that can be harnessed in sustainable manners
Learning Outcomes	At the end of this module learners will be able to: • Understand the different biofuels

	• Understand the difference between first and second generation biofuels • Perform environmental analysis of biofuel technologies
Units	Unit 6.1 Intro to biofuels Unit 6.2 First generation biofuels Unit 6.3 Second generation biofuels Unit 6.4 Biofuels environmental impact
Readings	Godfrey Boyle, " Renewable Energy, Power for a sustainable future", 2004, Oxford University Press (Chapter 4)
Activity	**Webinar** *Students are required to attend a webinar on energy production from Algae. Following the webinar, they will be assessed for their understanding of ocean biomass technologies.*
Module 6	**Socio-economic Issues**
Key Concepts	Renewable energy socio-economics
Overview	This module allows students to perform social, economic, and environmental analysis of renewable energy technologies, allowing them to assess the impact on community development. Questions answered in this module: • What are the impacts of energy production based on the source? • How are energy and the economy related? • How does renewable energy affect the lives of rural inhabitants? • How sustainable are renewables?
Aim	Student will develop the skills to perform socio-economic as well as environmental impact of different energy sources
Learning Outcomes	At the end of this module learners will be able to:

	• Perform socioeconomic analysis • Understand lifecycle assessment • Compare different technologies based on the three core categories
Units	Unit 7.1 Socio-economic impact of energy production and use Unit 7.2 Economics of energy Unit 7.3 Renewable energy in rural regions Unit 7.4 Lifecycle assessment of fossil and renewable fuels
Readings	REN 21, "Energy for Development", The Worldwatch Institute, 2005 http://www.worldwatch.org/system/files/ren21-1.pdf Fanchi, John R. "Energy in the 21st century" Hackensach, N.J." World Scientific, 2005 (Chapters 12)
Activity	**Quiz** *A 20-minute quiz to test students understanding of socio-economic issues related to the integration of renewable energy applications.*

SOCIAL ASPECTS OF RENEWABLE ENERGY FOR RURAL DEVELOPMENT

Course Number: ENV 222

Lebanese American University

Department of Natural Sciences

Fall 2014 Semester

Instructor Information

Instructor:	Prof. Dr. Ahmad Houri
Office Location:	Beirut campus, Sage 202
Telephone:	Office 961-786456 x1253
Office Hours:	MTW 11:00 – 1:00.
E-mail:	ahouri@lau.edu.lb
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Course Identification

Course Number:	ENV 222
Course Name:	Social Aspects of Renewable Energy for Rural Development
Course Location:	Sage G01, Beirut Campus
Class Times:	MWF 10:00 – 11:00
Prerequisites:	none
Faculty Web Page:	http://sas.lau.edu.lb/natural-sciences/people/ahouri.php

Course Description/Overview

“Rich are getting richer while the poor are getting poorer”. This can be described as the most commonly used phrase in the 21st century. This situation gets worse with the increasing prices of basic human needs such as food, clothing, and energy supply.

Energy has become a critical issue in both urban and rural areas. While the first appears to have enough resources to cover up their demand and avoid economic drops, rural regions remain poor at resources and potential, and mainly suffer from shortage in energy supply leading to a deterioration in their social and economic standing.

The course offers students a deep understanding of the role renewable energy plays in sustainable rural development. It allows students to study the various renewable energy applications that can be utilized in rural regions at low cost for improved social standing. During the course, students will examine the energy demand and requirements in rural regions and how renewable energy can be utilized to cover this demand, reducing low productivity in sectors such as agriculture and industry due to insufficient and interpretable supply of power, water, and other main resources.

Course Learning Objectives

The overarching goals of this course are:

e) To understand the importance of renewable energy in supporting rural communities and increasing the yield of productive sectors;

f) learn about the major rural applications of renewable energy and how they affect the lives of rural inhabitants;

g) examine real life applications of renewable energy in rural communities; and

h) assess the social impact of renewable energy in rural regions.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

104. Understand the importance of energy in rural regions
105. Understand the different renewable energy applications and their impact on rural communities
106. Set up sustainable rural development strategies

Course Outline

- *Module 1: Energy and Rural Areas*
    - *The impact of energy supply on rural regions*
    - *Rural demand for energy*
    - *Environmental cost of energy stress in rural regions*
    - *The role or renewable energy sources in rural regions*
- *Module 2: Solar Applications in Rural Regions*
    - *Solar cooking*
    - *Off-grid solar PV for electricity*
    - *Solar food drying*
    - *Solar water treatment*
    - *Solar pumping*
- *Module 3: Wind & Hydro Applications in Rural Regions*
    - *Wind water pumping*
    - *Small-scale water wheels*
    - *Water storage for electricity generation*
    - *Hydro for electricity generation*
- *Module 4: Biogas Applications in Rural Regions*
    - *Biogas for decentralized cooking*
    - *Biodiesel for agriculture transportation*
    - *Solid biomass*
    - *Liquid biofuels*

- *Module 5: Community-developed Renewable Applications*
    - *Building wind turbines*
    - *Building hydro turbines*
    - *Building solar collectors*
    - *Building biogas digesters*
- *Module 6: Micro-grids in Rural Communities*
    - *Micro grids for electricity*
    - *Independent power supply*
- *Module 7: Social Impact of Renewable Energy Supply in Rural Regions*
    - *Reduction of energy stress*
    - *Green jobs*
    - *Improved sector productivity*

Course Resources

Course Website

Through the BlackBoard Learn platform

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class
- El Bassam, N, Maegaard P. "Integrated Renewable Energy for Rural Communities: Planning Guidelines, Technologies and Applications", 2004

- REN 21, “Energy for Development”, The Worldwatch Institute, 2005 http://www.worldwatch.org/system/files/ren21-1.pdf
- Drupady, I. M., Sovacool, B. K., “Energy Access, Poverty, and Development: The Governance of Small-Scale Renewable Energy in Developing Asia” Ashgate Publishing, Ltd., 2013
- Rena, R., “Renewable Energy for Rural Development – A Namibian Experience”, A chapter in the book “Rural Development - Contemporary Issues and Practices”, 2012 http://www.intechopen.com/books/rural-development-contemporary-issues-and-practices/renewable-energy-for-rural-development-a-namibian-experience
- UNCTAD. “Renewable Energy Technologies for Rural Development”, 2010 http://unctad.org/en/Docs/dtlstict20094_en.pdf
- F. R. Manibog, “Improved cooking stoves in developing countries: problems and opportunities,” Annual Review of Energy 9, no. 1 (1984): 199-227
- C. Kirubi et al., “Community-Based Electric Micro-Grids Can Contribute to Rural Development: Evidence from Kenya,” World Development 37, no. 7 (2009)

Optional Course Texts and Materials

- Hulscher, W.S., Hommes, E.W. “Energy for sustainable rural development”, Butterworth-Heinemann, 1992 http://doc.utwente.nl/20664/1/Hulscher92energy.pdf http://doc.utwente.nl/20664/1/Hulscher92energy.pdf
- H. White, “The Welfare Impact of Rural Electrification: A Reassessment of the Costs and Benefits”, World Bank, 2008 http://siteresources.worldbank.org/EXTRURELECT/Resources/full_doc.pdf
- Solar Cookers International “Solar Cookers, how to make, use, and enjoy” 10th edition, 2004 http://solarcooking.org/plans/Plans.pdf

Assignments and Grading Scheme

Grading System

0 to 100 (where 60 is the least pass mark)

Grading Policy

Grades can be based on the following:

Quizzes/Assignments	25%	The best 5 out of 6 quizzes and assignments account for 25%
Exam	35%	Final exam covering all the material of the course accounting for 35%
Field Project	30%	Group project accounting for 30% of the final grade
Attendance/Discussion Forum	10%	Activeness in class discussions and discussion forums account for 10%
Total Points	100%	Final grade (60% minimum passing grade)

Course Policies

POLICY ON CHEATING AND PLAGIARISM

Students caught cheating on an exam receive a grade of zero on the exam in their first cheating attempt and receive a warning. Students caught cheating for the second time will receive a grade of "F" in the course and another warning. Plagiarism on assignments and project work is a serious offense. If plagiarism is detected, a student will be subject to penalty, similar to the cheating case, which ranges from receiving a zero on the assignment concerned to an "F" in the course in addition to a warning.

ATTENDANCE POLICY

16. Students are held responsible for all the material presented in the classroom, even during their absence.
17. Students can miss no more than the equivalent of five weeks of instruction and still receive credit for that course.
18. Instructors have the right to impose specific attendance regulations in their courses, provided that the above-stated limit of absences is not exceeded, and the minimum number of absences allowed is no fewer than the equivalent of two weeks of classroom instruction, after the Drop and Add period.
19. Instructors will inform the Departments Chairperson and the Guidance Office, of any prolonged unexplained absence.
20. Students who exceed the allowed number of absences must withdraw from the course; otherwise, the course grade will be recorded as "F" (NP).

WITHDRAWAL POLICY

"Students wishing to withdraw from one or more courses must follow the withdrawal procedure provided by the Registrar's Office. Students withdrawing from courses after the late registration period and before the withdrawal deadline will receive Ws for all the courses in progress."
Deadline for withdrawal from courses (WI): Oct 22, 2014 (It is the student's responsibility to drop the course)

COURSE ONLINE EVALUATIONS

Completion of the online course evaluations is required. Students will not be able to access their course grades until they have completed the course evaluations.

COURSE GENERAL NOTES

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

This class requires students to attend classes, participate in webinars, contribute to the discussion forum, submit periodic assignments and projects, and sit for prescheduled exams. Students are expected to attend all classes and participate in the different activities of the course.

At the end of each module there is a quiz/assignment that tests student's understanding of the course objectives and their ability to demonstrate the knowledge acquired throughout the module. At the middle of the course students will be assigned a project (in groups), to be submitted

during the last month of the courses. The final exam tests student's understanding of the course as a whole and includes concepts from the classes, discussion forums, assigned videos, and projects.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Course Schedule

Week	Module	Topics, Reading, Assignments and Deadlines
1	1	***Course Overview*** - The impact of energy supply on rural regions - Rural demand for energy
2		- Environmental cost of energy stress in rural regions - The role or renewable energy sources in rural regions ***Quiz 1***
3	2	- Off-grid solar PV for electricity
4		- Solar cooking - Solar food drying
5		- Solar water treatment - Solar pumping ***Assignment 1 (Case Study)***
6	3	- Wind water pumping - Small-scale water wheels
7		- Water storage for electricity generation - Hydro for electricity generation ***Assignment 2 (Case Study)***
8	4	- Biogas for decentralized cooking - Biodiesel for agriculture transportation
9		- Solid biomass - Liquid biofuels ***Assignment 3 (Case Study)***
10	5	- Building wind turbines - Building hydro turbines

11		- Building solar collectors - Building biogas digesters ***Project Overview***
12		- Field Assignment
13	6	- Micro grids for electricity - Independent power supply ***Quiz 2***
14	7	- Reduction of energy stress - Green jobs
15		- Improved sector productivity ***Quiz 3***
16		***Presentation of Project*** ***Final Exam***

Course	**Social Aspects of Renewables for Rural Development**
Module 1	**Energy and Rural Areas**
Key Concepts	Energy in rural regions, energy stress,
Overview	This module introduces the importance of energy in rural regions and studies the fundamental demand on electricity supply for economic and social development in remote areas. It allows students to assess the impact of insufficient supply of electricity at both social and environmental levels. Questions answered in this module: • What is the energy demand in rural regions? • What effects does energy stress on rural communities?

	• What is the environmental impact of energy stress? • How can renewable energy contribute to rural development?
Aim	This module puts things into perspective, giving students the background about energy demand in rural areas and the role renewable energy can play.
Learning Outcomes	At the end of this module learners will be able to: • Understand the energy demand in rural regions • Assess the impact of insufficient supply on the enrolment • Learn the role of renewable energy in sustainable rural development
Units	Unit 1.5 The impact of energy supply on rural regions Unit 1.6 Rural demand for energy Intro to energy Unit 1.7 Environmental cost of energy stress in rural regions Unit 1.8 The role or renewable energy sources in rural regions
Readings	El Bassam, N, Maegaard P. "Integrated Renewable Energy for Rural Communities: Planning Guidelines, Technologies and Applications", 2004 (Chapter 2)
Activity	**Quiz** *A 30-minute quiz to test students understanding of rural energy demand and renewable energy contribution*
Module 2	**Solar Applications in Rural Regions**
Key Concepts	Solar PV, solar pumping, solar food, solar water treatment
Overview	This module discusses solar applications in rural regions covering food drying, water pumping, electricity supply, water treatment, and cooking solutions. Questions answered in this module: • What are the possible low cost solar applications in rural regions? • How does solar contribute to social development? • How can solar energy reduce the carbon footprint in rural regions?

Aim	Students will learn about the most common solar technologies and should be able to identify the pros and cons of each application.
Learning Outcomes	At the end of this module learners will be able to: • Apply solar energy in rural regions • Identify what works and what doesn't based on the rural needs
Units	Unit 2.1 Off-grid solar PV for electricity Unit 2.2 Solar cooking Unit 2.3 Solar food drying Unit 2.4 Solar water treatment Unit 2.5 Solar pumping
Readings	El Bassam, N, Maegaard P. "Integrated Renewable Energy for Rural Communities: Planning Guidelines, Technologies and Applications", 2004 (Chapter 5 – Solar)
Activity	**Case Study: The Solar Home Systems in Indonesia** *Students to read the case study and submit a short essay with their analysis and feedback on the case.* *"Energy Access, Poverty, and Development: The Governance of Small-Scale Renewable Energy in Developing Asia" (Chapter 10)*
Module 3	**Wind & Hydro Applications in Rural Regions**
Key Concepts	Wind pumping, micro hydro applications
Overview	This module introduces micro-hydro and wind applications in rural regions. These applications are mainly used for electricity generation and water pumping. Questions answered in this module: • How to use wind power in rural regions? • How to harness hydro power through micro applications? • What impact do wind and hydro applications have on the environment?

Aim	Students will learn about the applicable wind and hydro applications mainly for the residential and industrial sectors
Learning Outcomes	At the end of this module learners will be able to: • Identify potential wind and hydro applications • Assess the applicability of hydro and wind technologies in rural regions
Units	Unit 3.1 Wind water pumping Unit 3.2 Small-scale water wheels Unit 3.3 Water storage for electricity generation Unit 3.4 Hydro for electricity generation
Readings	El Bassam, N, Maegaard P. "Integrated Renewable Energy for Rural Communities: Planning Guidelines, Technologies and Applications", 2004 (Chapter 5 – Wind)
Activity	**Case Study: China: solar PV and wind for off-grid electrification** *Students to read the case study and submit a short essay with their analysis and feedback on the case.* *"Renewable Energy Technologies for Rural Development", 2010 (4.3.2)*
Module 4	**Biogas Applications in Rural Regions**
Key Concepts	Biogas, woodstoves. biomass
Overview	The module tackles one of the most commonly utilized technologies in rural regions, Biomass/Biogas. With applications in water heating, cooking, agricultural use, and others. Questions answered in this module: • How is biomass used as a source of energy in rural regions? • How sustainable are biofuels in rural development? • What impact do they have on the environment?
Aim	Students will learn about the different uses of biomass and biogas in rural

	regions. They will be able to identify sustainable practices and efficient use of resources.
Learning Outcomes	At the end of this module learners will be able to: • Identify potential biomass and biogas applications • Identify applicable technologies based on available resources
Units	Unit 4.1 Biogas for decentralized cooking Unit 4.2 Biodiesel for agriculture transportation Unit 4.3 Solid biomass Unit 4.4 Liquid biofuels
Readings	El Bassam, N, Maegaard P. "Integrated Renewable Energy for Rural Communities: Planning Guidelines, Technologies and Applications", 2004 (Chapter 5 – Biogas)
Activity	**Case Study: China: Nepal Biogas Plant** *Students to read the case study and submit a short essay with their analysis and feedback on the case.* *"Renewable Energy Technologies for Rural Development", 2010 (4.2.2)*
Module 5	**Community Developed Renewable Applications**
Key Concepts	Locally made renewable technologies
Overview	This module discusses the potential for building and manufacturing technologies and components or renewable energy systems by local communities. Students will learn how to build a wind turbine, a biogas digester, a micro-hydro turbine, and solar thermal panels. Questions answered in this module: • How to produce renewable energy components? • What technologies can be integrated within the community? • What impact does capacity building have on the community?

Aim	Students will learn how to build renewable energy components and will be introduced to different lessons learn from previous experiences.
Learning Outcomes	At the end of this module learners will be able to: • Have basic knowledge on how to build renewable energy components • Assess the required resources to locally build components
Units	Unit 5.1 Building wind turbines Unit 5.2 Building hydro turbines Unit 5.3 Building solar collectors Unit 5.4 Building biogas digesters
Readings	N/A
Activity	**Project Preparation**
Module 6	**Micro-grids in Rural Communities**
Key Concepts	Micro-grids
Overview	The module focuses on electricity generation in rural areas through the use of renewable energy and with the development of dedicated micro-grids. Questions answered in this module: • How are micro-grids designed in rural areas? • What benefit do micro-grids bring into rural communities?
Aim	Students will be introduced to micro-grid applications and how such grids are developed in remote areas
Learning Outcomes	At the end of this module learners will be able to: • Know what benefits micro-grids bring to communities • Be aware of different micro-grid designs and requirements • Assess the environmental impact of micro-grids
Units	Unit 6.1 Micro-grids for electricity

	Unit 6.2 Independent power supply
Readings	C. Kirubi et al., "Community-Based Electric Micro-Grids Can Contribute to Rural Development: Evidence from Kenya," World Development 37, no. 7 (2009)
Activity	**Quiz** *A 30-minute quiz to test students understanding of micro-grids and their applicability*
Module 7	**Social Impact of Renewable Energy Supply in Rural Regions**
Key Concepts	Social impact of renewables
Overview	The final module presents the impact of renewable energy on rural communities. Impact including economic growth through green jobs, improved sectors productivity, and increased comfort. Questions answered in this module: • How does renewable energy improve the social and economic conditions in rural regions? • What are the benefits behind massive utilization of renewable energy in rural areas?
Aim	Students will learn how to perform socio-economic impact assessment and learn about the importance of renewable energy in rural regions
Learning Outcomes	At the end of this module learners will be able to: • Assess the socio-economic impact of renewables • Identify the added value of utilizing renewable energy
Units	Unit 7.1 Reduction of energy stress Unit 7.2 Green jobs Unit 7.3 Improved sector productivity
Readings	UNCTAD. "Renewable Energy Technologies for Rural Development", 2010

	(Chapter 2)
Activity	**Quiz***A 30-minute quiz to test students ability to perform socio-economic impact assessment*

FINANCING RENEWABLE ENERGY

Course Syllabus

Course Number: ENV 223

Lebanese American University

Department of Natural Sciences

Fall 2014 Semester

Instructor Information

Instructor:	Prof. Dr. Ahmad Houri
Office Location:	Beirut campus, Sage 202
Telephone:	Office 961-786456 x1253
Office Hours:	MTW 11:00 – 1:00.
E-mail:	ahouri@lau.edu.lb
Website:	http://ahmad.houri.lau.edu.lb/

Course Identification

Course Number:	ENV 223
Course Name:	Financing Renewable Energy
Course Location:	Sage G01, Beirut Campus
Class Times:	MWF 10:00 – 11:00
Prerequisites:	none
Faculty Web Page:	http://sas.lau.edu.lb/natural-sciences/people/ahouri.php

Course Description/Overview

With frequent increasing fluctuation of oil prices, the shift towards renewable energy is becoming more and more realistic. Nations are adopting renewable energy strategies to avoid remaining hand-tied and improve energy security, always with environmental concerns in mind.

With the remarkable technical advancements and the growing target market, renewable energy has become an option that every community and every family discuss going for it and reducing fossil fuel consumption. But the major barrier remains, which is the financing requirements of renewable energy projects.

There is no doubt that renewables do have less operating expenses compared to conventional energy, and less maintenance as well in so many conditions, but the capital investment is still too high to compare to a fuel oil or natural gas power plants. This requires a well-structured financing mechanism, a sustainable mechanism that would promote the use of clean energy and reduce the human impact on the environment.

This course presents the different financing methods being applied and discussed a couple of case studies from the developing world.

Course Learning Objectives

The overarching goals of this course are:

i) To provide a general overview of different financing schemes applicable for renewable energy;

j) show from previous experiences what works and what doesn't;

k) identify policy requirements for each method; and

l) establish a comprehensive guide on technology-specific financing methods.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

107. Understand the different financing schemes applicable to renewable energy
108. Know what mechanisms works in certain conditions
109. Understand the requirements and needs to secure sufficient and reliable financing

Course Outline

- *Module 1: Introduction to Renewables Energy Finance*
  - *Renewable energy technologies*
  - *Financing requirements*
  - *Project bankability*
  - *Internationally followed financed mechanisms*
- *Module 2: Debt finance*
  - *Non-recourse financing*
  - *Development banks and multilateral institutions*
  - *Micro-credit*
  - *Leasing*
  - *Revolving funds*
  - *Rural credit cooperatives*
- *Module 3: Grants and Guarantees*
  - *Loan guarantees*
  - *Partial loan guarantees*

    - *Political risk insurance*
- *Module 4: Equity Financing*
    - *Joint ventures*
    - *Equity investment funds and individual investors*
    - *Venture capital*
- *Module 5: Types of Financing Models*
    - *Government-led*
    - *Market-based*
- *Module 6: Types of Financing Regulations*
    - *Fiscal Measures*
    - *Subsidies*
    - *Market based*
    - *Institutional finance*

Course Resources

Course Website

Through the BlackBoard Learn platform

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class
- Financing options for renewable energy and energy efficiency http://africa-toolkit.reeep.org/modules/Module19.pdf

Assignments and Grading Scheme

Grading System

0 to 100 (where 60 is the least pass mark)

Grading Policy

Grades can be based on the following:

Quizzes/Assignments	25%	The best 5 out of 6 quizzes and assignments account for 25%
Exam	45%	Final exam covering all the material of the course accounting for 45%
Project	20%	Group project accounting for 20% of the final grade
Attendance/Discussion Forum	10%	Activeness in class discussions and discussion forums account for 10%
Total Points	100%	Final grade (60% minimum passing grade)

Course Policies

Classroom Protocol

POLICY ON CHEATING AND PLAGIARISM

Students caught cheating on an exam receive a grade of zero on the exam in their first cheating attempt and receive a warning. Students caught cheating for the second time will receive a grade of "F" in the course and another warning. Plagiarism on assignments and project work is a

serious offense. If plagiarism is detected, a student will be subject to penalty, similar to the cheating case, which ranges from receiving a zero on the assignment concerned to an "F" in the course in addition to a warning.

ATTENDANCE POLICY

21. Students are held responsible for all the material presented in the classroom, even during their absence.
22. Students can miss no more than the equivalent of five weeks of instruction and still receive credit for that course.
23. Instructors have the right to impose specific attendance regulations in their courses, provided that the above-stated limit of absences is not exceeded, and the minimum number of absences allowed is no fewer than the equivalent of two weeks of classroom instruction, after the Drop and Add period.
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25. Students who exceed the allowed number of absences must withdraw from the course; otherwise, the course grade will be recorded as "F" (NP).

WITHDRAWAL POLICY

"Students wishing to withdraw from one or more courses must follow the withdrawal procedure provided by the Registrar's Office. Students withdrawing from courses after the late registration period and before the withdrawal deadline will receive Ws for all the courses in progress."
Deadline for withdrawal from courses (WI): Oct 22, 2014 (It is the student's responsibility to drop the course)

COURSE ONLINE EVALUATIONS

Completion of the online course evaluations is required. Students will not be able to access their course grades until they have completed the course evaluations.

COURSE GENERAL NOTES

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

This class requires students to attend classes, participate in webinars, contribute to the discussion forum, submit periodic assignments and projects, and sit for prescheduled exams. Students are expected to attend all classes and participate in the different activities of the course.

At the end of each module there is a quiz/assignment that tests student's understanding of the course objectives and their ability to demonstrate the knowledge acquired throughout the module. At the middle of the course students will be assigned a project (in groups), to be submitted during the last month of the courses. The final exam tests student's understanding of the course as a whole and includes concepts from the classes, discussion forums, assigned videos, and projects.

Disability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Course Schedule

Week	Module	Topics, Reading, Assignments and Deadlines
1	1	***Course Overview*** - Renewable energy technologies
2		- Financing requirements - Project bankability
3		- Internationally followed financed mechanisms ***Quiz 1***
4	2	- Non-recourse financing - Development banks and multilateral institutions
5		- Micro-credit - Leasing
6		- Revolving funds - Rural credit cooperatives ***Quiz 2***
7	3	- Loan guarantees - Partial loan guarantees
8		- Political risk insurance ***Quiz 3***
9	4	- Joint ventures
10		- Equity investment funds and individual investors
11		- Venture capital ***Project Discussion*** ***Quiz 4***
12	5	- Government-led
13		- Market-based

		Quiz 5
14	6	- Fiscal Measures - Subsidies
15		- Market based - Institutional finance ***Quiz 6***
16		***Presentation of Project*** ***Final Exam***

Course	Financing Renewable Energy
Module 1	**Introduction to Renewable Energy Finance**
Key Concepts	Renewable energy finance requirements, project bankability
Overview	This module gives a brief introduction about renewable energy technologies and financing requirements. It presents major renewable energy applications and the bankability analysis process along with main financing schemes being currently followed Questions answered in this module: • What renewable energy technologies require financing? • What are the requirements to apply for financing? • What makes a proposal bankable?
Aim	This module aims at giving students basic understanding of renewable energy and major financing mechanisms.
Learning Outcomes	At the end of this module learners will be able to: • Identify bankable projects • Know what is needed to apply for financing
Units	Unit 1.1 Renewable energy technologies Unit 1.2 Financing requirements Unit 1.3 Project bankability Unit 1.4 Internationally followed financed mechanisms
Readings	
Activity	**Quiz** *A 20-minute quiz to test students understanding of basic renewable energy financing requirements*

Module 2	**Debt Finance**
Key Concepts	Micro credit, debt financing , leasing, revolving funds
Overview	This module presents the various debt financing options applicable to renewable energy projects and ventures. This involves non-resource financing, multinational institutions, micro-credit, leasing, revolving funds, and rural credit cooperatives. Questions answered in this module: • What are the applicable debt financing options? • How does debt financing work?
Aim	This module aims at giving students a comprehensive understanding of different debt financing options
Learning Outcomes	At the end of this module learners will be able to: • Understand the different debt financing mechanisms • Know the pros and cons of each mechanism • Identify the proper mechanism for each type of project
Units	Unit 2.1 Non-recourse financing Unit 2.2 Development banks and multilateral institutions Unit 2.3 Micro-credit Unit 2.4 Leasing Unit 2.5 Revolving funds Unit 2.6 Rural credit cooperatives
Readings	Financing options for renewable energy and energy efficiency (4.1)
Activity	**Quiz** *A 20-minute quiz to test students understanding of debt financing for renewable energy*
Module 3	**Grants and Guarantees**

Key Concepts	Loan financing, risk insurance, partial loan guarantees
Overview	This module presents the various grants and guarantees financing options applicable to renewable energy projects and ventures. This involves loans and partial loans as well as political risk insurance. Questions answered in this module: • What are the applicable grants and guarantees financing options? • How does grant financing work?
Aim	This module aims at giving students a comprehensive understanding of different grants and guarantees financing options available
Learning Outcomes	At the end of this module learners will be able to: • Understand the different grants and guarantees options • Know the pros and cons of each option • Identify the proper mechanism for each type of project
Units	Unit 3.1 Loan guarantees Unit 3.2 Partial loan guarantees Unit 3.3 Political risk insurance
Readings	Financing options for renewable energy and energy efficiency (4.3)
Activity	**Quiz** *A 20-minute quiz to test students understanding of grants and guarantees financing options for renewable energy*
Module 4	**Equity Financing**
Key Concepts	Joint venture financing, equity investment, venture capital
Overview	This module presents the various equity financing options applicable to renewable energy projects and ventures. This involves joint ventures, equity investment funds, individual investors, and venture capital. Questions answered in this module:

	• What are the applicable equity financing options? • How does equity financing work?
Aim	This module aims at giving students a comprehensive understanding of different equity financing options
Learning Outcomes	At the end of this module learners will be able to: • Understand the different equity financing mechanisms • Know the pros and cons of each mechanism • Identify the proper mechanism for each type of project
Units	Unit 4.1 Joint ventures Unit 4.2 Equity investment funds and individual investors Unit 4.3 Venture capital
Readings	Financing options for renewable energy and energy efficiency (4.2)
Activity	**Quiz** *A 20-minute quiz to test students understanding of equity financing for renewable energy*
Module 5	**Types of Financing Models**
Key Concepts	Market based financing models, government led financing models
Overview	This module presents the various financing models based on two categories. The first being government-led, and the second market-based Questions answered in this module: • What is the difference between government-led and market-based financing models? • What are some practical government-led financing models? • What are some practical market-based financing models?
Aim	This module aims at giving students a comprehensive understanding of different

	government-led and market-based financing models
Learning Outcomes	At the end of this module learners will be able to: • Understand the difference between government-led and market-based financing models • Understand the different financing models and how they apply to renewable energy projects
Units	Unit 5.1 Government-led Unit 5.2 Market-based
Readings	Financing options for renewable energy and energy efficiency (Chapter 5)
Activity	**Quiz** *A 20-minute quiz to test students understanding of government-led and market-based financing models for renewable energy*
Module 6	**Types of Financing Regulations**
Key Concepts	Fiscal measures, subsidies, market-based financing regulations
Overview	This module presents the various financing regulations and policies being currently applied including fiscal measures, subsidy programs, market based regulations, and institutional financing. Questions answered in this module: • What are the major fiscal measures applied? • What are the major subsidy programs applied? • What are the major market-based regulations applied? • How does each of these regulations work?
Aim	This module aims at giving students a comprehensive understanding of different financing instruments and regulations being applied
Learning	At the end of this module learners will be able to:

Outcomes	• Understand the different financing policies and regulations applied internationally • Identify the practical measures for specific situations
Units	Unit 6.1 Fiscal Measures Unit 6.2 Subsidies Unit 6.3 Market based Unit 6.4 Institutional finance
Readings	Financing options for renewable energy and energy efficiency (Chapter 6)
Activity	**Quiz** *A 20-minute quiz to test students understanding of existing financing regulations for renewable energy*

WORLD OCEAN SOLUTIONS

Course Syllabus

Course Number: ENV 224

Lebanese American University

Department of Natural Sciences

Fall 2014 Semester

Instructor Information

Instructor:	Prof. Dr. Ahmad Houri
Office Location:	Beirut campus, Sage 202
Telephone:	Office 961-786456 x1253
Office Hours:	MTW 11:00 – 1:00.
E-mail:	ahouri@lau.edu.lb
Website:	http://ahmad.houri.lau.edu.lb/

Course Identification

Course Number:	ENV 224
Course Name:	World Ocean Solutions
Course Location:	Sage G01, Beirut Campus
Class Times:	MWF 10:00 – 11:00
Prerequisites:	none
Faculty Web Page:	http://sas.lau.edu.lb/natural-sciences/people/ahouri.php

Course Description/Overview

More than 70% of earth surface is water, leaving less than 30% for human utilization for various activities. Around 361,130,976 square kilometres is the total surface area of water on earth that has proven to be rich in resources and potential. Human have started benefiting from these resources mainly focusing on fishing and oil extraction, but there is more potential than just this.

The terrifyingly growing population that is expected to exceed 9 billion in2050, and the depletion of resources, together put a lot of pressure on food, water, and energy supplies, thus threaten biodiversity and contribute to climate deterioration.

This course explores untapped potential within the world ocean (oceans and seas) and studies its capacity in providing human basic needs to reduce food, water, and energy supply stress.

Course Learning Objectives

The overarching goals of this course are:

m) to understand the critical global challenges facing humanity;

n) to study the hidden potential within the ocean; and

o) to investigate the possibility of using oceans to secure more water, food and energy;

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

110. Have clear understanding of the major global challenges facing humanity

111. Understand the potential within the world ocean

112. Learn how solutions from the ocean can reduce the effect of global challenges

113. Learn how solutions from the ocean can mitigate climate change

Course Outline

- *Module 1: The World Ocean*
    - *The five oceans*
    - *Physical and biological properties of oceans and seas*
- *Module 2: Global Human Challenges*
    - *Global challenges facing humanity*
    - *Climate change*
    - *Clean water*
    - *Sufficient food*
    - *Energy supply*
- *Module 3: Energy from the Ocean*
    - *Thermal energy*
    - *Mechanical energy*
- *Module 4: Water from the Ocean*
    - *Conventional desalination*
    - *Solar desalination*
- *Module 5: Food from the Ocean*
    - *Food chain in the ocean*
    - *Ocean plants*
    - *Seafood of the ocean*
    - *Sustainable fishing*

- *Module 6: Climate Change Mitigation*
    - *Effect of climate change on the ecosystem*
    - *Carbon skins*
    - *Carbon capture and storage*

Course Resources

Course Website

Course webpage will be available through BlackBoard Learn platform.

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class
- Charlier, R. H., Finkl, C. W., "Ocean Energy: Tide and Tidal Power". Springer (2009)
- Micale, M., Rizzuti, M., Cipollina, A. "Seawater Desalination: Conventional and Renewable Energy Processes", Springer (2009)
- Pauly, D. and Watson, R. 2003. Counting the last fish. Scientific American, July: 42-47.

Optional Course Texts and Materials

- UN Global Issues: http://www.un.org/en/globalissues/
- "Human Development Report 2014", UNDP

Assignments and Grading Scheme

Grading System

0 to 100 (where 60 is the least pass mark)

Grading Policy

Grades are based on the following:

Quizzes/Assignments	25%	The best 5 out of 6 quizzes and assignments account for 25%
Exam	40%	Final exam covering all the material of the course accounting for 40%
Project	25%	Group project accounting for 25% of the final grade
Attendance/Discussion Forum	10%	Activeness in class discussions and discussion forums account for 10%
Total Points	100%	Final grade (60% minimum passing grade)

Course Policies

Classroom Protocol

POLICY ON CHEATING AND PLAGIARISM

Students caught cheating on an exam receive a grade of zero on the exam in their first cheating attempt and receive a warning. Students caught cheating for the second time will receive a grade of "F" in the course and another warning. Plagiarism on assignments and project work is a

serious offense. If plagiarism is detected, a student will be subject to penalty, similar to the cheating case, which ranges from receiving a zero on the assignment concerned to an "F" in the course in addition to a warning.

ATTENDANCE POLICY

1. Students are held responsible for all the material presented in the classroom, even during their absence.
2. Students can miss no more than the equivalent of five weeks of instruction and still receive credit for that course.
3. Instructors have the right to impose specific attendance regulations in their courses, provided that the above-stated limit of absences is not exceeded, and the minimum number of absences allowed is no fewer than the equivalent of two weeks of classroom instruction, after the Drop and Add period.
4. Instructors will inform the Departments Chairperson and the Guidance Office, of any prolonged unexplained absence.
5. Students who exceed the allowed number of absences must withdraw from the course; otherwise, the course grade will be recorded as "F" (NP).

WITHDRAWAL POLICY

"Students wishing to withdraw from one or more courses must follow the withdrawal procedure provided by the Registrar's Office. Students withdrawing from courses after the late registration period and before the withdrawal deadline will receive Ws for all the courses in progress."
Deadline for withdrawal from courses (WI): Oct 22, 2014 (It is the student's responsibility to drop the course)

COURSE ONLINE EVALUATIONS

Completion of the online course evaluations is required. Students will not be able to access their course grades until they have completed the course evaluations.

COURSE GENERAL NOTES

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

This class requires students to attend classes, participate in webinars, contribute to the discussion forum, submit periodic assignments and projects, and sit for prescheduled exams. Students are expected to attend all classes and participate in the different activities of the course.

At the end of each module there is a quiz/assignment that tests student's understanding of the course objectives and their ability to demonstrate the knowledge acquired throughout the module. At the middle of the course students will be assigned a project (in groups), to be submitted during the last month of the courses. The final exam tests student's understanding of the course as a whole and includes concepts from the classes, discussion forums, assigned videos, and projects.

Disability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Course Schedule

Week	Module	Topics, Reading, Assignments and Deadlines
1	1	***Course Overview*** - The five oceans
2		- Physical and biological properties of oceans and seas ***Quiz 1***
3	2	- Global challenges facing humanity - Climate change
4		- Clean water - Sufficient food
5		- Energy supply ***Assignment 1***
6	3	- Thermal energy
7		- Mechanical energy ***Quiz 2***
8	4	- Conventional desalination
9		- Solar desalination ***Assignment 2***
10	5	- Food chain in the ocean - Ocean plants
11		- Seafood of the ocean - Sustainable fishing ***Quiz 3***
12	6	- Effect of climate change on the ecosystem
13		- Carbon skins

14		- Carbon capture and storage
15		- International experiences ***Quiz 4***
16		***Presentation of Project*** ***Final Exam***

-

Course	Renewable Energy for Development
Module 1	**The World Ocean**
Key Concepts	Ocean characteristics
Overview	The introductory module will define oceans and seas and present the different characteristics of these water areas. It will help students have a general understanding of these systems. Questions answered in this module: • What makes an ocean and what makes a sea? • What is the difference between an ocean and a sea? • What characteristics does each system has?
Aim	The aim is to familiarize students with the definition and characteristics of the world oceans
Learning Outcomes	At the end of this module learners will be able to: • Know the differences between oceans and sea • Know what to expect in an ocean and what to expect in a sea
Units	Unit 1.9 The five oceans Unit 1.10 Physical and biological properties of oceans and seas
Readings	N/A
Activity	**Quiz** *A 20-minute quiz to test students understanding of oceans properties and characteristics*
Module 2	**Global Human Challenges**
Key Concepts	Global challenges, climate change, water stress, energy stress, food stress
Overview	The module will discuss the global challenges facing humanity and will focus on

	four major challenges namely food scarcity, energy supply, clean water availability, and climate change. Questions answered in this module: • What are the major challenges facing humanity? • How is climate change threatening human lives? • What are the major water-related issues facing humanity? • What are the major food-related issues facing humanity? • What are the major energy-related issues facing humanity?
Aim	Students should learn about the difference challenges threatening lives and the critical levels we have reached when it comes to water, food, and energy.
Learning Outcomes	At the end of this module learners will be able to: • Understand different global challenges • Relate global issues to human life • Understand the critical situation the world is currently facing
Units	Unit 2.1 Global challenges facing humanity Unit 2.2 Climate change Unit 2.3 Clean water Unit 2.4 Sufficient food Unit 2.5 Energy supply
Readings	UN Global Issues: http://www.un.org/en/globalissues/
Activity	**Assignment** *Students will be asked to choose a global challenge and perform links and relations analysis.*
Module 3	**Energy from the Ocean**
Key Concepts	Renewable energy from the ocean, tidal power, wave power, osmotic power

Overview	This module introduces students to the possible methods for generating power from the ocean, covering both renewable and non-renewable resources. Students will learn about techniques to produce electricity through both thermal and mechanical conversion including tidal power, wave power, heat pumps, natural gas, and many others. Questions answered in this module: • How can energy be harnessed from the ocean? • How sustainable it is to use wave and tidal power? • Is it possible to generate electricity from algae and other plants? • How much energy can be produced?
Aim	Give a comprehensive understanding of energy generation from the ocean, covering conventional and new technologies.
Learning Outcomes	At the end of this module learners will be able to: • Know about the different possible technologies • Understand the practicality and limitations of ocean energy solutions • Quantify the potential energy generation
Units	Unit 3.1 Thermal energy Unit 3.2 Mechanical energy
Readings	Ocean Energy: Tide and Tidal Power (Chapter 1)
Activity	**Quiz** *A 20-minute quiz to test students understanding of oceans power solutions*
Module 4	**Water from the Ocean**
Key Concepts	Ocean characteristics
Overview	This module presents possible solutions to generate clean water from the ocean, examining conventional and nonconventional desalination methods.

	Questions answered in this module: • How can clean water be produced from the ocean? • How has desalination technology improved? • How can renewable energy be used in desalination?
Aim	Introduce students to desalination techniques and possibilities to produce clean water from oceans and seas.
Learning Outcomes	At the end of this module learners will be able to: • Understand how desalination works • Understand the pros and cons of seawater desalination • Understand the impact of renewable energy on water desalination
Units	Unit 4.1 Conventional desalination Unit 4.2 Solar desalination
Readings	Seawater Desalination: Conventional and Renewable Energy Processes
Activity	**Assignment** *Prepare a brief report on a desalination technologies utilizing renewable energy*
Module 5	**Food from the Ocean**
Key Concepts	Ocean food chain, fishing, seafood, ocean bioresources
Overview	This module looks at oceans as a source of food. This includes different types such as flat fish and bioresources, Questions answered in this module: • What food sources are available in the ocean? • How is ocean food harnessed? • What makes sustainable harnessing?
Aim	Understand the food chain in the ocean and the sustainable methods in harnessing food from the ocean.

Learning Outcomes	At the end of this module learners will be able to: • Learn about food sources in the ocean • Identify sustainable fishing methods • Understand the food chain in the ocean
Units	Unit 5.1 Food chain in the ocean Unit 5.2 Ocean plants Unit 5.3 Seafood of the ocean Unit 5.4 Sustainable fishing
Readings	Counting the last fish
Activity	**Quiz** *A 20-minute quiz to test students understanding of Marine Fisheries Food Webs*
Module 6	**Climate Change Mitigation**
Key Concepts	Climate change, carbon capture and storage, carbon sink
Overview	This module looks at climate change and mitigation options. First it studies the effect of climate change on the ocean, and then looks at the ocean as a climate change mitigation option. Questions answered in this module: • What effect does climate change have on the ocean? • How does the ocean contribute to climate change mitigation? • How can carbon capture and storage be performed in the ocean?
Aim	Understand the link between climate change and oceans and learn about the potential mitigation options available.
Learning Outcomes	At the end of this module learners will be able to: • Link climate change with oceans • Know what can be done at oceans to mitigate climate change

	• Understand the potential applications of carbon capture and carbon sinks
Units	Unit 6.1 Effect of climate change on the ecosystem Unit 6.2 Carbon skins Unit 6.3 Carbon capture and storage
Readings	N/A
Activity	**Quiz** *A 20-minute quiz to test students understanding of oceans and climate change mitigation*

ENERGY IN BUILDINGS

Course Syllabus

Course Number: ENV 225

Lebanese American University

Department of Natural Sciences

Fall 2014 Semester

Instructor Information

Instructor: Prof. Dr. Ahmad Houri

Office Location: Beirut campus, Sage 202

Telephone: Office 961-786456 x1253

Office Hours:	MTW 11:00 – 1:00.
E-mail:	ahouri@lau.edu.lb
Website:	http://ahmad.houri.lau.edu.lb/

Course Identification

Course Number:	ENV 225
Course Name:	Energy in Buildings
Course Location:	Sage G01, Beirut Campus
Class Times:	MWF 10:00 – 11:00
Prerequisites:	none
Faculty Web Page:	http://sas.lau.edu.lb/natural-sciences/people/ahouri.php

Course Description/Overview

Buildings are reported to share more than 40% of the global energy consumption, and emitting large amounts of greenhouse gases that are contributing to climate change and global warming. Buildings are the highest electricity consuming sector, especially residential buildings that are occupied 24/7, consuming electricity mainly for lighting, air conditioning, and water heating purposes.

The course presents the concept of energy conservation in buildings and the role it plays in reducing greenhouse gas emissions. It illustrates the different green building design systems and shows the economic and environmental benefits behind efficient building design and operation.

Course Learning Objectives

The overarching goals of this course are to:

p) explain the role buildings play in increasing GHG emissions;

q) present the different methods that can be followed to reduce energy consumption in the building sector;

r) explain the different accreditation and certification systems followed in green building design; and

s) demonstrate the added value of energy efficiency in buildings at different levels including human comfort, environment, and money saving.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

114. Link greenhouse gas emissions to the building sector

115. Understand energy efficiency measures and their rile in reducing consumption

116. Perform energy audit to buildings

117. Understand the different green building certification systems

Course Outline

- *Module 1: The Energy Context*
  - *Introduction to energy*
  - *Energy conversion*
  - *Electrical and thermal energy systems*
- *Module 2: Energy Consumption in Buildings*
  - *Energy systems in buildings*
  - *Building envelope*
  - *Energy consumption measurements*
- *Module 3: Energy Conservation in Buildings*
  - *Electrical energy conservation measures*
  - *Thermal energy conservation measures*
  - *Good housekeeping measures*
- *Module 4: Energy Audits*
  - *Introduction to energy audits*
  - *Types of energy audits*
  - *Energy audit analysis*
- *Module 5: Green Building Design*
  - *The concept of green buildings*
  - *Green building impact assessment*

    - *Green building showcases*
- *Module 6: Green Building Certification*
    - *LEED*
    - *BREEAM*
    - *Other rating systems*

Course Resources

Course Website

Available through the BlackBoard Learn platform.

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class
- Harris, D., A "Guide to Energy Management in Buildings", Spon Press (2011)

Optional Course Texts and Materials

- Harvey, D. "A Handbook on Low-Energy Buildings and District-Energy Systems: Fundamentals, Techniques, and Examples" (2006)
- Krigger, J., "Residential Energy: Cost Savings and Comfort for Existing Buildings" 5th, Starun (2009)
- Kibert, C. J., "Sustainable Construction: Green Building Design and Delivery" 3rd Edition, Wiley (2012)
- Reed, L., "Guide to Green Building Rating Systems", Wiley (2010)

Assignments and Grading Scheme

Grading System

0 to 100 (where 60 is the least pass mark)

Grading Policy

Grades will be based on the following:

Quizzes/Assignments	20%	The best 6 out of 7 quizzes and assignments account for 20%
Exam	30%	Final exam covering all the material of the course accounting for 30%
Project	40%	Group project accounting for 40% of the final grade
Attendance/Discussion Forum	10%	Activeness in class discussions and discussion forums account for 10%
Total Points	100%	Final grade (60% minimum passing grade)

Course Policies

Classroom Protocol

POLICY ON CHEATING AND PLAGIARISM

Students caught cheating on an exam receive a grade of zero on the exam in their first cheating attempt and receive a warning. Students caught cheating for the second time will receive a grade of "F" in the course and another warning. Plagiarism on assignments and project work is a serious offense. If plagiarism is detected, a student will be subject to penalty, similar to the cheating case, which ranges from receiving a zero on the assignment concerned to an "F" in the course in addition to a warning.

ATTENDANCE POLICY

6. Students are held responsible for all the material presented in the classroom, even during their absence.
7. Students can miss no more than the equivalent of five weeks of instruction and still receive credit for that course.
8. Instructors have the right to impose specific attendance regulations in their courses, provided that the above-stated limit of absences is not exceeded, and the minimum number of absences allowed is no fewer than the equivalent of two weeks of classroom instruction, after the Drop and Add period.
9. Instructors will inform the Departments Chairperson and the Guidance Office, of any prolonged unexplained absence.
10. Students who exceed the allowed number of absences must withdraw from the course; otherwise, the course grade will be recorded as "F" (NP).

WITHDRAWAL POLICY

"Students wishing to withdraw from one or more courses must follow the withdrawal procedure provided by the Registrar's Office. Students withdrawing from courses after the late registration period and before the withdrawal deadline will receive Ws for all the courses in progress."
Deadline for withdrawal from courses (WI): Oct 22, 2014 (It is the student's responsibility to drop the course)

COURSE ONLINE EVALUATIONS

Completion of the online course evaluations is required. Students will not be able to access their course grades until they have completed the course evaluations.

COURSE GENERAL NOTES

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

This class requires students to attend classes, participate in webinars, contribute to the discussion forum, submit periodic assignments and projects, and sit for prescheduled exams. Students are expected to attend all classes and participate in the different activities of the course.

At the end of each module there is a quiz/assignment that tests student's understanding of the course objectives and their ability to demonstrate the knowledge acquired throughout the module. At the middle of the course students will be assigned a project (in groups), to be submitted

during the last month of the courses. The final exam tests student's understanding of the course as a whole and includes concepts from the classes, discussion forums, assigned videos, and projects.

Disability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Course Schedule

Week	Module	Topics, Reading, Assignments and Deadlines
1	1	***Course Overview*** - Introduction to energy - Energy conversion
2		- Electrical and thermal energy systems ***Quiz 1***
3	2	- Energy systems in buildings
4		- Building envelope - Energy consumption measurements ***Assignment 1***
5	3	- Electrical energy conservation measures
6		- Thermal energy conservation measures - Good housekeeping measures ***Quiz 2***
7	4	- Introduction to energy audits - Types of energy audits
8		- Energy audit analysis
9		- Energy Audit project
10		
11	5	- The concept of green buildings
12		- Green building impact assessment - Green building showcases **Quiz 2**
13	6	- LEED

14		- BREEAM
15		- Other rating systems ***Assignment 2***
16		***Presentation of Project*** ***Final Exam***

Course	Renewable Energy for Development
Module 1	**The Energy Context**
Key Concepts	Energy conversion, energy systems
Overview	The introductory module introduces the concept of energy and energy conversion. It goes through the process of generating and consuming energy in its different methods, tackling different electrical and thermal energy systems. Questions answered in this module: • How is energy quantified? • How is energy transferred? • What are the characteristics of electrical and thermal energy systems?
Aim	Introduce the concept of energy and familiarize students with the process of producing electricity starting with primary energy to energy consumption
Learning Outcomes	At the end of this module learners will be able to: • Understand energy conversion methods • Understand thermal energy systems • Understand electrical energy systems
Units	Unit 1.1 Introduction to energy Unit 1.2 Energy conversion Unit 1.3 Electrical and thermal energy systems
Readings	Residential Energy: Cost Savings and Comfort for Existing Buildings (Chapter 1)
Activity	**Quiz** *A 20-minute quiz to test students understanding of energy.*
Module 2	**Energy Consumption in Buildings**
Key Concepts	Energy in buildings, building envelope, electricity consumption

Overview	This module gets into buildings and studies energy consumption in both commercial and residential buildings. It presents the major energy systems inside buildings including lighting, HVAC and others, as well as the effect of building envelope on energy consumption inside buildings. Questions answered in this module: • What are the major energy consuming energy systems in buildings? • What is the effect of building envelope on energy demand? • How is electrical energy measured?
Aim	Familiarize students with energy systems in buildings and their effect on electricity consumptions
Learning Outcomes	At the end of this module learners will be able to: • Understand different energy systems in buildings • Understand the significant role of building envelope • Perform basic measurements and analysis of electricity consumption in buildings
Units	Unit 2.1 Energy systems in buildings Unit 2.2 Building envelope Unit 2.3 Energy consumption measurements
Readings	Guide to Energy Management in Buildings (Chapter 2)
Activity	**Assignment** *Students will be asked to perform basic electricity consumption measurement and analysis at their own residence and submit a 2-page analysis report*
Module 3	**Energy Conservation in Buildings**
Key Concepts	Electricity saving, energy conservation measures
Overview	After introducing the different energy systems in buildings, this module presents energy saving potential and measures that can be taken to reduce electricity

	consumption in buildings. Measures in both electrical and thermal systems as well as basic good housekeeping measures. Questions answered in this module: • How to reduce energy consumption in electrical systems? • How to reduce energy consumption in thermal systems? • What are the basic good housekeeping measures that can be followed to reduce energy consumption? • How to perform feasibility analysis of energy conservation measures?
Aim	Provide students with solid knowledge of electrical and thermal energy systems and potential saving measures in buildings.
Learning Outcomes	At the end of this module learners will be able to: • Propose energy saving measures in buildings • Perform feasibility analysis of energy saving measures
Units	Unit 3.1 Electrical energy conservation measures Unit 3.2 Thermal energy conservation measures Unit 3.3 Good housekeeping measures
Readings	Guide to Energy Management in Buildings (Chapter 4) A Handbook on Low-Energy Buildings and District-Energy Systems (Chapters 13 & 14)
Activity	**Quiz** *A 20-minute quiz to test students understanding of feasibility analysis of energy conservation measures in buildings.*
Module4	**Energy Audits**
Key Concepts	Energy auditing
Overview	This module introduces energy audits to students presenting to them the different types of energy audits and how each is performed based on special

	cases. Questions answered in this module: • What is an energy audit? • What are the different types of energy audits? • What does and energy audit report include? • How to perform a comprehensive energy audit?
Aim	Provide students with the tools and knowledge to conduct energy audit studies and perform financial and environmental analysis
Learning Outcomes	At the end of this module learners will be able to: • Perform a comprehensive energy audit
Units	Unit 4.1 Introduction to energy audits Unit 4.2 Types of energy audits Unit 4.3 Energy audit analysis
Readings	Guide to Energy Management in Buildings (Chapters 3 & 5)
Activity	**Project** *Students will be asked to perform a complete energy audit to a selected facilities. This project will be performed in groups.*
Module 5	**Green Building Design**
Key Concepts	Green building design, green building impact assessment
Overview	This module introduces the concept of green building and the impact of green design on the energy consumption and environmental performance e of buildings. Questions answered in this module: • What is green building design? • What impact does a green building have? • What additional costs does a green building require?

Aim	Introduce students to the concept of green building and present to them calculation methods to quantify the pros and cons of green building design.
Learning Outcomes	At the end of this module learners will be able to: • Identify the design principles of green building • Quantify the added value of green building design • Link green building design to climate change mitigation
Units	Unit 5.1 The concept of green buildings Unit 5.2 Green building impact assessment Unit 5.3 Green building showcases
Readings	Sustainable Construction: Green Building Design and Delivery (Chapters 2 & 3)
Activity	**Quiz** *A 20-minute quiz to test students understanding of feasibility analysis of green buildings.*
Module6	**Green Building Certification**
Key Concepts	Green building certification, LEED, BREEAM
Overview	This module elaborates on green buildings and presents the different rating systems available with focus on LEED and BREEAM systems. Questions answered in this module: • What are applicable green building rating systems • What is LEED? • What is BREAM?
Aim	Students will have comprehensive information about green building rating systems and their applicability.
Learning Outcomes	At the end of this module learners will be able to: • Know what rating systems apply in specific cases

	• Perform basic LEED and BREEAM assessment • Know what makes a building green
Units	Unit 6.1 LEED Unit 6.2 BREEAM Unit 6.3 Other rating systems
Readings	Guide to Green Building Rating Systems
Activity	**Assignment** *Students will be asked to submit a comparative report about different green building rating systems*

SUSTAINABILITY IN PRACTICE

Course Syllabus

Course Number: ENV230

Lebanese American University

Department of Natural Sciences

Fall 2014 Semester

Instructor Information

Instructor: Prof. Dr. Ahmad Houri

Office Location: Beirut campus, Sage 202
Telephone: Office 961-786456 x1253
Office Hours: MTW 11:00 – 1:00.
E-mail: ahouri@lau.edu.lb
Website: http://ahmad.houri.lau.edu.lb/

Course Identification

Course Number: ENV 230
Course Name: Sustainability in Practice
Course Location: Sage G01, Beirut Campus
Class Times: MWF 10:00 – 11:00
Prerequisites: none
Faculty Web Page: http://sas.lau.edu.lb/natural-sciences/people/ahouri.php

Course Description/Overview

Defined as "meeting the needs of the present without compromising the ability of future generations to meet their own needs", sustainability has become one of the hottest topics in the 21st century. International agencies and organizations have clearly declared their commitment to establish more sustainable processes and operations in which a future for our kids and grandkids is guaranteed.

This course tackles sustainability from its practical perspective, and studies human actions and capabilities to handle global change, climatic deterioration, ecosystem degradation, and resource depletion. It covers the millennium development goals and the factors directly linked to achieving them. Factors such as growing population, energy demand, water scarcity, climate change, and environmental economics will be discussed.

Course Learning Objectives

The overarching goals of this course are:

t) To provide a clear understanding of sustainability and its importance;

u) offer an understanding of the major factors influencing sustainability;

v) understand the energy water nexus; and

w) measure sustainability and environmental footprint.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

118. Define sustainability in practice

119. Learn about the UN Millennium Development Goals

120. Understand the factors influencing sustainability

Course Outline

- *Module 1: Introduction to Sustainability*
  - *What is sustainability?*
  - *Sustainable development*
  - *UN Millennium Development Goals*
- *Module 2: Population Evolution*
  - *Demographic transition*

    - *Population pyramids*
    - *Birth/death rates*
- *Module 3: Climatic Deterioration*
    - *Climate change*
    - *Greenhouse gases*
    - *Tragedy of the commons*
    - *Ecosystem extinction*
- *Module 4: Energy & Sustainability*
    - *Peak oil*
    - *Energy forecast*
    - *Renewable energy*
    - *Energy efficiency*
- *Module 5: Water & Agriculture*
    - *Assessment of water resources*
    - *The water cycle*
    - *Agricultural yield*
    - *Green revolution*
- *Module 6: Measuring Sustainability*
    - *Sustainability metric*
    - *Carbon footprint*
    - *Biodiversity*
    - *Food mile*

- *Module 7: Seminar on Sustainable Development*

Course Resources

Course Website

Through the BlackBoard Learn platform

Required Course Texts and Materials

- Handouts prepared by the instructor for the class
- Theis, T., Tomkin, J., "Sustainability: A Comprehensive Foundation", University of Illinois (2012)
- Olla, P., "Global Sustainable Development and Renewable Energy Systems", Madonna University (2012)
- The Millennium Development Goals Report", (2014) http://www.un.org/millenniumgoals/2014%20MDG%20report/MDG%202014%20English%20web.pdf
- DVD: An Inconvenient Truth (2006), directed by Davis Guggenheim

Assignments and Grading Scheme

Grading System

0 to 100 (where 60 is the least pass mark)

Grading Policy

Grades can be based on the following:

Quizzes/Assignments	25%	The best 5 out of 6 quizzes and assignments account for 25%
Exam	35%	Final exam covering all the material of the course accounting for 35%
Project	25%	Group project accounting for 25% of the final grade
Attendance/Discussion Forum	15%	Activeness in class discussions and discussion forums account for 15%
Total Points	100%	Final grade (60% minimum passing grade)

Course Policies

Classroom Protocol

POLICY ON CHEATING AND PLAGIARISM

Students caught cheating on an exam receive a grade of zero on the exam in their first cheating attempt and receive a warning. Students caught cheating for the second time will receive a grade of "F" in the course and another warning. Plagiarism on assignments and project work is a serious offense. If plagiarism is detected, a student will be subject to penalty, similar to the cheating case, which ranges from receiving a zero on the assignment concerned to an "F" in the course in addition to a warning.

ATTENDANCE POLICY

11. Students are held responsible for all the material presented in the classroom, even during their absence.
12. Students can miss no more than the equivalent of five weeks of instruction and still receive credit for that course.

13. Instructors have the right to impose specific attendance regulations in their courses, provided that the above-stated limit of absences is not exceeded, and the minimum number of absences allowed is no fewer than the equivalent of two weeks of classroom instruction, after the Drop and Add period.
14. Instructors will inform the Departments Chairperson and the Guidance Office, of any prolonged unexplained absence.
15. Students who exceed the allowed number of absences must withdraw from the course; otherwise, the course grade will be recorded as "F" (NP).

WITHDRAWAL POLICY

"Students wishing to withdraw from one or more courses must follow the withdrawal procedure provided by the Registrar's Office. Students withdrawing from courses after the late registration period and before the withdrawal deadline will receive Ws for all the courses in progress."
Deadline for withdrawal from courses (WI): Oct 22, 2014 (It is the student's responsibility to drop the course)

COURSE ONLINE EVALUATIONS

Completion of the online course evaluations is required. Students will not be able to access their course grades until they have completed the course evaluations.

COURSE GENERAL NOTES

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

This class requires students to attend classes, participate in webinars, contribute to the discussion forum, submit periodic assignments and projects, and sit for prescheduled exams. Students are expected to attend all classes and participate in the different activities of the course.

At the end of each module there is a quiz/assignment that tests student's understanding of the course objectives and their ability to demonstrate the knowledge acquired throughout the module. At the middle of the course students will be assigned a project (in groups), to be submitted during the last month of the courses. The final exam tests student's understanding of the course as a whole and includes concepts from the classes, discussion forums, assigned videos, and projects.

Course Schedule

Week	Module	Topics, Reading, Assignments and Deadlines
1	1	***Course Overview*** - What is sustainability? - Sustainable development
2		- UN Millennium Development Goals ***Quiz 1***
3	2	- Demographic transition - Population pyramids - Birth/death rates ***Assignment 1 (DVD)***
4	3	- Climate change - Greenhouse gases
5		- Tragedy of the commons - Ecosystem extinction ***Assignment 2***
6	4	- Peak oil - Energy forecast
7		- Renewable energy
8		
9		- Energy efficiency - ***Assignment 3***
10	5	- Assessment of water resources - Water conservation
11		- Agricultural yield - Green revolution

		Quiz 2
12	6	- Sustainability metric - Carbon footprint
13		- Biodiversity - Food mile ***Assignment 4***
14	7	- Seminar on sustainable development
15		
16		***Presentation of Project*** ***Final Exam***

Course	Sustainability in Practice
Module 1	**Introduction to Sustainability**
Key Concepts	Sustainability, sustainable development, MDG
Overview	This introductory module introduces sustainability and sustainable development and presents the UN Millennium Development Goals (MDG), studying each of the eight goals and providing real life examples Questions answered in this module: • What is sustainability? • What is sustainable development? • What are the MDGs?
Aim	Achieve a common understanding of sustainability and learn about the worlds initiative for sustainable development
Learning Outcomes	At the end of this module learners will be able to: • Clearly define sustainability • Know how sustainable development is performed • Understand the MDGs
Units	Unit 1.11 What is sustainability? Unit 1.12 Sustainable development Unit 1.13 UN Millennium Development Goals
Activity	**Quiz** *A 20-minute quiz to test students understanding of sustainability and the MDGs*
Module 2	**Population Evolution**
Key Concepts	Population change, demographic transition, population pyramid
Overview	This module discusses the evolution of population and the transitions happening

	to the demographics of the earth. How population affects the sustainability and how this growth requires additional efforts to ensure continuation and avoid of resource depletion. Questions answered in this module: • How did the population grow? • What effect did this change have on sustainability?
Aim	Understand the demographic factor and its effect on sustainability
Learning Outcomes	At the end of this module learners will be able to: • Learn about the changes affecting world population • Understand the effect of population on sustainable living
Units	Unit 2.1 Demographic transition Unit 2.2 Population pyramids Unit 2.3 Birth/death rates
Activity	**Assignment (DVD)** *Watch the video "An Inconvenient Truth" by Al Gore and submit a short essay with reflections.*
Module 3	**Climatic Deterioration**
Key Concepts	Climate change, greenhouse gases emissions, tragedy of commons, ecosystem
Overview	The module focuses on climatic issues and the environmental conditions that are against sustainable development. It links human population and increase consumption to climate change and resource depletion. Questions answered in this module: • How is sustainability affected by climate change? • How are greenhouse emissions affecting climate change? • What does tragedy of commons mean?

Aim	Understand the reality behind climate change and link it to sustainability
Learning Outcomes	At the end of this module learners will be able to: • Understand the effect of humans on climate change and thus on sustainability • Quantify greenhouse gas emissions and propose mitigation methods
Units	Unit 3.1 Climate change Unit 3.2 Greenhouse gases Unit 3.3 Tragedy of the commons Unit 3.4 Ecosystem extinction
Activity	**Assignment** *Perform carbon inventory for yourself*
Module 4	**Energy & Sustainability**
Key Concepts	Renewable energy, energy forecast, energy efficiency
Overview	This module tackles the major factor behind climate change, which is increasing rapidly with the increase in population. Energy consumption and methods to reduce the negative impact of energy demand are discussed, including renewable energy technologies and energy efficiency methods. Questions answered in this module: • How does energy lead to environmental deterioration? • What renewable energy technologies help in reducing GHG emissions? • How can energy efficiency enhance sustainability?
Aim	Understand the effect of energy on the environment and learn about possible solutions to reduce carbon footprint while meeting energy demands.
Learning Outcomes	At the end of this module learners will be able to: • Understand the link between energy and sustainability

	• Know about the possible solutions to reduce energy impact
Units	Unit 4.1 Peak oil Unit 4.2 Energy forecast Unit 4.3 Renewable energy Unit 4.4 Energy efficiency
Activity	**Assignment** *Choose an unconventional energy source and perform environmental impact assessment.*
Module 5	**Water & Agriculture**
Key Concepts	Water resources, water conservation, agricultural yield
Overview	This module targets another major sustainability issue, which is water and its scarcity. The module discusses water resources and presents solution on water conservation. Questions answered in this module: • How serious is water scarcity? • What are possible solution to reduce water waste? • How to perform water assessment? • How is agriculture affected by water availability?
Aim	Understand the importance of water and learn about actions to save on water resources
Learning Outcomes	At the end of this module learners will be able to: • Know the importance of water for sustainability • Reduce water consumption and increase water use efficiency • Understand green agriculture and water conservation methods
Units	Unit 5.1 Assessment of water resources

	Unit 5.2 Water conservation Unit 5.3 Agricultural yield Unit 5.4 Green revolution
Activity	**Quiz** *A 20-minute quiz to test students understanding of sustainability in the agricultural sector*
Module 6	**Measuring Sustainability**
Key Concepts	Sustainability measurement, carbon footprint
Overview	This module gives the students a deep understanding of sustainability measurements and evaluation techniques including footprint, biodiversity protection, food mile and others. Questions answered in this module: • How is sustainability assessed? • How to measure carbon footprint? • What does carbon neutral really mean?
Aim	Be able to perform sustainability evaluation and propose active measures to enhance the sustainability level
Learning Outcomes	At the end of this module learners will be able to: • Perform sustainability evaluation • Perform carbon footprint calculation
Units	Unit 6.1 Sustainability metric Unit 6.2 Carbon footprint Unit 6.3 Biodiversity Unit 6.4 Food mile
Activity	**Assignment** *Perform sustainability measurement of yourself. This time with a roadmap to*

	improve sustainability level.

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number:MEE401

Energy Systems & Sustainable Environments

Lebanese American University, Faculty of Engineering, Department of Industrial & Mechanical Engineering

Fall Semester, 2014

Instructor Information

Instructor: Dr. Wassim Habchi

Office Location: Bassil hall office 204

Telephone: Office – +961 9 547254

Office Hours: TTH 9:30 - 11:00 am or by appointment

E-mail: wassim.habchi@lau.edu.lb

Website: WWW.LAU.EDU.LB

Course Identification

Course Number: PRGR 620
Course Name: Energy Systems & Sustainable Environments
Location: University Campus
Class Times:
Prerequisites: None

Faculty Web Page: WWW.LAU.EDU.LB

Course Description/Overview

This course introduces students to the concept of sustainability in the context of energy use. It stresses on the different aspects involved in our daily-life use of energy: environmental, societal, political, financial, etc. It covers technologies and means used in improving the sustainability of current fossil-fuel (coal, oil and gas) based energy systems, electric and nuclear systems by reducing their environmental and societal impacts. Finally, it introduces different renewable ('clean') energy technologies that can be used as alternatives to traditional ('dirty') energy systems.

Course Learning Objectives

The general objective of this course is to familiarize students with the problems associated with our daily-life use of energy (environmental, societal, economic, political …) and to introduce solutions to these problems. The course does not go deep in the technological aspects of the solutions as these will be covered individually in other courses of the PROGREEN curriculum, but rather focuses on putting them in the context of achieving a sustainable energy future.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- Identify different forms and sources of energy and their availability
2- Identify the environmental and health impacts of energy systems
3- Assess the environmental and health impacts of energy systems
4- Identify the implications of energy use on a political, societal, economic and environmental level
5- Estimate the cost of energy in domestic, industrial and transportation applications
6- Identify means of reducing the environmental impact of fossil-fuel-based energy systems
7- Assess the importance of renewable energy and green technologies as alternatives to fossil-fuelled energy

Course Website(s)

Required Course Texts and Materials

- "Godfrey Boyle, Bob Everett and Janet Ramage, Energy Systems and Sustainability: Power for a Sustainable Future, Oxford, 2003

Technical Requirements

- Intermediate computer skills

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 4 (where 2 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)
The course grade is calculated according to the following:

Quiz 1	12
Quiz 2	8
Quiz 3	8
Quiz 4	16
Quiz 5	24
Quiz 6	12
Quiz 7	20
Total Points	100

Course Policies.

Classroom Protocol

General Rules

1. Make your messages easier to read by making your paragraphs short and to the point.
2. TYPING IN ALL CAPS IS CONSIDERED SHOUTING ON THE INTERNET.
3. Messages in all lowercase letters can be difficult to read, instead, use normal capitalization.
4. *Asterisks* surrounding a word can be used to make a stronger point.
5. Be careful when using sarcasm and humor. Without face-to-face communications your joke may be viewed as criticism. When being humorous, use emoticons to express humor. (tilt your head to the left to see the emoticon smile) :-) = happy face for humor
6. Never give your user ID or password to another person. System administrators that need to access your account for maintenance or to correct problems will have full privileges to your account.

Make-up Policy

Failure to take a quiz during the assigned period will result in a grade of zero for that quiz unless the student has personally contacted the instructor and received permission to miss the quiz. A quiz missed due to a valid excuse must be made up within one week of the original assigned date. The student is responsible for arranging the make-up session with the course instructor.

Important Dates to Remember

Topics covered and course schedule

Week	**Topic**
Week 1	Module 1: Watch video, Take assigned quiz
Week 2	Module 2: Watch video, Take assigned quiz
Week 3-4	Module 3: Watch video, Take assigned quiz
Week 5-7	Module 4: Watch video, Take assigned quiz
Week 8-10	Module 5: Watch video, Take assigned quiz
Week 11-13	Module 6: Watch video, Take assigned quiz
Week 14-15	Module 7: Watch video, Take assigned quiz

APENDIX II: The CLIMASP Course Modules Template Example

Course	**Energy Systems**
Module 1	Introducing Energy Systems & Sustainability
Key Concepts	Energy systems, Sustainability
Overview	This module introduces learners to the importance of energy and its use on a global scale. It explains the problem of scarcity of fossil fuel energy resources and its economic impact on our society. It also covers the environmental problems associated with the use of fossil fuels as a primary source of energy. Finally, it introduces potential solutions to reduce the impact of excessive energy consumption on our society, climate, environment…
Aim	The overriding aim of this module is to describe our current global energy system and its associated societal, environmental and political problems.
Learning Outcomes	At the end of this module learners will be able to: • Understand the concept of sustainability • Apply the concept of sustainability in the framework of energy systems • Understand the societal, environmental, political… implications of our energy dependence • Identify possible solutions to reducing the impact of our energy dependence on our society and environment.
Units	Unit 1.1: Energy Sustainability and its Importance

	Unit 1.2: The Current global Energy System Unit 1.3: Environmental and Socio-Political Aspects of Energy Usage Unit 1.4: Towards Low-Carbon Energy Systems
Readings	Chapter 1 of course textbook
Activity	**Overview** Assignment 1.1: Watch the movie: “An inconvenient truth” by Al Gore Assignment 1.2: Watch the movie of Module 1 Quiz 1: Covers Module 1
Module 2	Primary Energy and its Usage
Key Concepts	Primary energy, Forms of energy, Energy efficiency
Overview	This module covers primary energy sources and the different forms of energy. It also discusses the difference between energy and power and the variety of units associated to them. Finally it discusses the concept of energy efficiency which allows quantification of the performance of typical energy transformation processes.
Aim	The overriding aim of this module is to introduce energy, its different forms and its different associated units and the concept of energy conversion efficiency.
Learning Outcomes	At the end of this module learners will be able to: • Identify primary sources of energy • Identify different forms of energy • Distinguish energy from power • Identify and manipulate different units associated to energy and power • Evaluate the efficiency of standard energy conversion processes
Units	Unit 2.1: Energy and Power Unit 2.2: Units and Dimensions

	Unit 2.3: Forms of Energy Unit 2.4: Energy Efficiency
Readings	Chapters 2 to 4 of course textbook
Activity	**Overview**
	Assignment 2.1: Watch the movie of Module 2 Quiz 2: Covers Module 2
Module 3	Coal Systems
Key Concepts	Coal resource, Coal boilers, Flue gases, Heat to motive power, Clean-coal technologies
Overview	This module covers the use of Coal as a primary energy resource. It describes coal mining technologies as well as the different types of boilers and furnaces used in coal combustion. It also covers the undesirable emissions within coal combustion flue gases and introduces techniques to reduce these and their impact on the environment and climate. Finally, this module describes standard technologies used in converting heat produced from coal combustion into motive power.
Aim	The overriding aim of this module is to describe the use of coal as a primary energy source, from mining to power production and post-production cleaning of flue gases.
Learning Outcomes	At the end of this module learners will be able to: • Identify different types of coal found in the ground • Understand the process of coal mining from the ground • Identify different types of furnaces and boilers used in coal combustion • Understand the operating principles of different types of coal boilers • Identify the composition of coal flue gases • Assess the impact of coal combustion emissions on the environment and climate

	• Identify mechanical systems for converting heat into motive power • Understand the operating principles of steam engines and coal power stations • Identify technologies used in “cleaning” coal combustion
Units	Unit 3.1: The Coal Resource Unit 3.2: Furnaces and Boilers Unit 3.3: Coal Combustion Flue Gases Unit 3.4: Heat to Motive Power (Steam Engines and Steam Turbines) Unit 3.5: Power Station Turbine Systems Unit 3.6: The Future of Coal-Fired Systems
Readings	Chapters 5 and 6 of course textbook
Activity	**Overview**
	Assignment 3.1: Watch the movie of Module 3 Quiz 3: Covers Module 3
Module 4	Oil and Gas Systems
Key Concepts	Oil resources, Gas resources, Pollution reduction, Oil availability
Overview	This module covers the use of oil and gas as primary energy sources. It covers ground extraction techniques as well as refinement technologies. It also covers technologies used in converting the heat from oil and gas combustion into mechanical power. It also discusses pollution problems associated with oil and gas combustion. Finally, it discusses the problem of the future availability of oil as a primary energy resource.
Aim	The overriding aim of this module is to describe the use of oil and gas as primary energy sources, from ground extraction to power production and post-production cleaning of undesired emissions.
Learning	At the end of this module learners will be able to:

Outcomes	• Identify types of oil and gas found in the ground and their major locations • Understand the extraction process of oil and gas from the ground • Understand the process of oil and gas refinement • Understand the operating principles of oil and gas engines • Identify means of reducing pollutant emissions from oil and gas engines • Understand the problem of future scarcity of oil and gas resources
Units	Unit 4.1: Oil and Gas Resources Unit 4.2: Oil and Gas Engines (SI, CI and Gas Turbine Engines) Unit 4.3: Pollution Reduction in Oil and Gas Systems Unit 4.4: Future Availability of Oil
Readings	Chapters 7 and 8 of course textbook
Activity	**Overview**
	Assignment 4.1: Watch the movie of Module 4 Quiz 4: Covers Module 4
Module 5	Electricity
Key Concepts	Electricity generation, Electricity transmission, Electricity distribution, Electricity use, Combined Heat and Power (CHP)
Overview	This module introduces electricity as a primary energy source. It covers several aspects pertaining to electricity: its small and large-scale generation from batteries or generators, its transmission, distribution and end-user consumption. It also covers the Combined Heat and Power (CHP) generation cycle and compares its performance to that of standard gas or steam cycles.
Aim	The overriding aim of this module is to cover the use of electricity as a "primary" energy source from generation to transmission, distribution and end-user consumption.

Learning Outcomes	At the end of this module learners will be able to: • Understand the process of electricity generation: Chemical (Batteries), Electromagnetic (Generators) • Appraise the ever expanding use of electricity in our daily life for lighting, traction drives, heating and cooling… • Understand the process of large-scale production of electricity • Understand the operating principle of CHP cycles
Units	Unit 5.1: Electricity Generation: Chemical (Batteries), Electromagnetic (Generators) Unit 5.2: The Expanding Uses of Electricity (Lighting, Traction Drives, Heating and Cooling) Unit 5.3: Large-Scale Electricity Generation Unit 5.4: Combined Heat and Power Unit 5.5: Transmission and Distribution
Readings	Chapter 9 of course textbook
Activity	**Overview**
	Assignment 5.1: Watch the movie of Module 5 Quiz 5: Covers Module 5
Module 6	**Nuclear Power**
Key Concepts	Radioactivity, Nuclear power production, Nuclear safety
Overview	This module covers the concept of radioactivity and its use in nuclear power production. It also covers nuclear safety, electricity generation costs from nuclear energy, the availability of nuclear resources and political issues pertaining to the widespread use of nuclear energy.
Aim	The overriding aim of this module is to understand power production from nuclear resources and its associated cost, political and safety issues.

Learning Outcomes	At the end of this module learners will be able to: • Understand the concept of radioactivity • Identify underlying processes in nuclear power production (fission and fusion) • Understand the difference between open and closed nuclear cycles • Identify technological as well as societal/political issues related to nuclear power production
Units	Unit 6.1: Radioactivity Unit 6.2: Nuclear Power Production (Nuclear Fission and Nuclear Fusion) Unit 6.3: Nuclear Fuel Cycles (Open and Closed Cycles) Unit 6.4: Nuclear Power Today (Safety, Generation Costs, Uranium Availability)
Readings	Chapters 10 and 11 of course textbook
Activity	**Overview**
	Assignment 6.1: Watch the movie of Module 6 Quiz 6: Covers Module 6
Module 7	**Towards a Sustainable Energy Future**
Key Concepts	Clean-energy technologies, Renewable energy, Energy sustainability
Overview	This module covers a wide range of solutions/measures to reach a sustainable energy future from cleaning-up fossil fuels to geo-engineering solutions, the use of Hydrogen as a fuel, reducing energy demand and renewable energy solutions.
Aim	The overriding aim of this module is to introduce a wide variety of solutions/measures to reach a sustainable energy future.
Learning Outcomes	At the end of this module learners will be able to: • Identify various solutions/measures to improve the sustainability of our current global energy system

	• Identify technologies to clean-up fossil fuel emissions • Identify different geo-engineering technologies to improve energy sustainability • Understand the use of Hydrogen as a clean fuel in different applications • Understand the importance of reducing energy demand as a measure to improve energy sustainability • Understand the impact and the use of renewable energy technologies in reaching a sustainable energy future
Units	Unit 7.1: Cleaning-Up Fossil Fuels Unit 7.2: Geo-Engineering Solutions Unit 7.3: Hydrogen Fuel (Fuel Cell Technology, Hydrogen as a Combustion Fuel) Unit 7.4: Reducing Energy Demand Unit 7.5: Renewable Energy Solutions
Readings	Chapter 14 of course textbook
Activity	**Overview**
	Assignment 7.1: Watch the movie of Module 7 Quiz 7: Covers Module 7

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number: MEE599J

Energy Audit

Lebanese American University, Faculty of Engineering, Department of Industrial & Mechanical Engineering

Fall Semester, 2014

Instructor Information

Instructor:	Dr. I. A. Ali
Office Location:	Bassil hall office 105
Telephone:	Office – +961 9 547254
Office Hours:	MWF 1:00pm-2:50pm or by appointment
E-mail:	ihab.ali@lau.edu.lb
Website:	WWW.LAU.EDU.LB

Course Identification

Course Number:	MEE 599J
Course Name:	Energy Audit
Course Location:	University Campus

Class Times:

Prerequisites: MEE 403 Heat Transfer, Fourth Year Standing

Faculty Web Page: WWW.LAU.EDU.LB

Course Description/Overview

This course covers the survey of energy sources, cost analysis, alternatives, environmental issue, audit techniques, and technical reporting.

Course Learning Objectives

N/A

Course Content Learning Outcomes

The course is designed to help the student understand the importance of energy management and conservation in industrial as well as in real life applications. Upon successful completion of this course the student will be able to:

1. Identify the different areas where energy conservation may be achieved: Buildings, industry, transportation...
2. Assess the importance of energy conservation in a political, environmental, ethical and societal context.
3. Apply economics methods on engineering systems in order to reduce their energy consumption.

4. Have knowledge of contemporary energy efficient systems, tools and techniques. Course Resources

Course Website(s)

http://en.wikipedia.org/wiki/Infrastructure_asset_management
http://www.fhwa.dot.gov/infrastructure/asstmgmt/amppinf.cfm
http://www.ibi.ethz.ch/research/im/research/index_EN
http://www.fcm.ca/home/programs/past-programs/infraguide.htm
https://www.fcm.ca/.../Managing_Infrastructure_Assets_EN.pdf

http://www.hdmglobal.com/

Required Course Texts and Materials

"Energy: Management, Supply and Conservation", By Clive Beggs, Butterwoth & Heinemann, 2005

Energy Management and Conservation Handbook", Edited By, Kreith and Goswami, 2008
The instructor; class notes and handouts; the library; the web

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 4 (where 2 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)
The course grade is calculated according to the following:

Exam I	30%
Exam II	30%
Final Exam	40%
Total Points	**100**

Course Policies.

Classroom Protocol

All students must take Exams as scheduled. Failure to take an exam or the final exam during the assigned class period will result in a grade of zero on that test unless the student has personally contacted me and received permission from me to be absent from the test.

- 1- A student can miss no more than 4 sessions of instruction. By the 5th session, the instructor may ask the student to drop the course.

- Plagiarism: students caught cheating on an exam will receive a grade of Zero on the exam in the first cheating attempt and a warning. Students caught cheating for the second time in the same course will receive an F grade in the course and a second warning. A grade of zero on an exam resulting from cheating must be counted in the student's course grade.

- Any student who receives 3 warnings will be suspended

Important Dates to Remember

Topics covered and course schedule

Week	**Topic**
Week 1	
Week 2-3	
Week 3-4	

Week 5	
Week 6-7	
Week 8	
Week 9-10	
Week 10-14	

APENDIX II: The CLIMASP Course Modules Template Example

Course	**Energy Audit**
Module 1	Introduction to energy management and conservation
Key Concepts	Energy management, Energy conservation
Overview	This module introduces learners to the importance of energy and its use on a global scale. It explains the problem of scarcity of fossil fuel energy resources and its economic impact on our society. It also covers the environmental problems associated with the use of fossil fuels as a primary source of energy. It also introduces the different barriers that prevent energy conservation measures from being applied adequately. Finally, several energy management

	tools and techniques are identified and examined.
Aim	The overriding aim of this module is to convey to the learner the importance of energy use and its associated problems on a worldwide scale and most of all the urgency of applying conservation measures as a remedy to these problems.
Learning Outcomes	At the end of this module learners will be able to: • Understand the importance of energy use and its worldwide impact • Identify barriers to energy conservation • Identify energy management tools • Assess the environmental, social and economic implications of energy use
Units	Unit 1.1: Importance of energy use and its worldwide impact Unit 1.2: Barriers to energy conservation Unit 1.3: Energy management tools Unit 1.4: Environmental, social and economic implications of energy use
Readings	Chapter 1 of course textbook
Activity	**Overview** Assignment 1.1: Watch the movie: “An inconvenient truth” by Al Gore
Module 2	Energy consumption and prices
Key Concepts	Energy consumption, Energy Prices, Forecasts of energy resources availability
Overview	This module covers worldwide energy consumption and prices in different sectors of the economy: household, industry, transportation… It also covers the most common types of energy sources and provides an overview of their current availability and prices as well as a forecast of these.
Aim	The overriding aim of this module is to cover the current state of global energy

	use in different sectors of the economy and provide an overview of current and future availability of energy resources and their prices.
Learning Outcomes	At the end of this module learners will be able to: • Evaluate energy consumption by sectors of the economy • Describe global energy consumption in the past and its future projections • Assess future scarcity of fossil fuel resources and its implication on fuel prices • Understand the problem of global warming and its roots
Units	Unit 2.1: Energy consumption by sectors of the economy Unit 2.2: Energy consumption: the past and future projections Unit 2.3: Future scarcity of fossil fuel resources and its implication on fuel prices Unit 2.4: Global warming and its roots
Readings	Chapters 2 and 3 of course textbook
Activity	**Overview**
	Prepare a brief 5 minutes presentation on the availability of a given type of energy resource (Gasoline, Diesel, Coal, Renewables…), its prices, the sectors in which it is used…
Module 3	Economics methods
Key Concepts	Time value of money, Economic methods, Risk assessment, Taxes
Overview	This module covers economic aspects such as the time value of money including the effects of earning and purchasing power. It also introduces various economics methods used in the assessment of project performance (e.g. LCC, NPW, BCR, ROR…) including risk assessment. It also discusses the issue of taxes and tax subsidies related to investment in green energy

	technologies.
Aim	This overriding aim of this module is to introduce economic methods used in the evaluation of the economic performance of energy conservation measures.
Learning Outcomes	At the end of this module learners will be able to: • Understand the concept of time value of money • Apply economic methods to study the economic performance of energy conservation measures • Incorporate risk assessment in economic calculations • Understand tax subsidies related to investments in green technologies
Units	Unit 3.1: Time value of money: discounting, compounding, inflation… Unit 3.2: Overview of economic methods: o Life-Cycle Cost (LCC) o Net Present Worth (NPW) o Benefit-to-Cost Ratio (BCR) o Rate Of Return (ROR) o Discounted Payback Unit 3.3: Risk assessment Unit 3.4: Taxes and subsidies
Readings	Chapter 6 of course textbook
Activity	**Overview**
	• Homework problems • Exam I: Covers Modules 1 to 3
Module 4	Energy audits for buildings and facilities
Key Concepts	Energy conservation measures for buildings, state-of-the-art technologies

Overview	This module covers energy conservation measures for buildings and assesses their economic performance through several applied examples. It also introduces state-of-the-art technologies used in reducing energy consumption in buildings.
Aim	The overriding aim of this module is to introduce energy conservation measures for building and assess their economic performance.
Learning Outcomes	At the end of this module learners will be able to: • Apply an energy audit for a building • Identify energy conservation measures for buildings • Assess the economic performance of energy conservation measures for buildings • Identify state-of-the-art technologies used in energy conservation in buildings
Units	Unit 3.1: Energy audit types and general procedure for a detailed energy audit Unit 3.2: Energy conservation measures Unit 3.3: State-of-the-art technologies
Readings	Chapters 5 and 7 of course textbook
Activity	**Overview**
	Assignment: Apply a basic energy audit to your living place. For this, identify different applicable energy conservation measures and assess their economic potential.
Module 5	Energy efficient heating
Key Concepts	Efficient HVAC systems
Overview	This module introduces the concept of thermal comfort and how it can be utilized to minimize energy used in heating and air-conditioning. It also

	introduces various ventilation systems and corresponding energy conservation measures.
Aim	The overriding aim of this module is to teach the students how heating, ventilation and air-conditioning (HVAC) energy requirements of a building / facility can be minimized.
Learning Outcomes	At the end of this module learners will be able to: • Understand the concept of thermal comfort • Evaluate heat losses in buildings / facilities • Apply energy efficient measures to reduce the HVAC requirements of a building / facility
Units	Unit 5.1: Thermal comfort Unit 5.2: Evaluation of building heat losses Unit 5.3: Energy conservation measures and their economic potential
Readings	Chapters 8 and 11 of course textbook
Activity	**Overview**
	• Homework problems • Exam II: Covers Modules 4 to 5
Module 6	**Waste heat recovery**
Key Concepts	Heat exchangers, waste heat recovery
Overview	This module introduces different types of heat exchangers used in waste heat recovery and assesses their technological and economic impact on the systems in which they are incorporated.
Aim	The overriding aim of this module is to understand how waste heat recovery systems may be used to enhance the technological as well as the economic

	performance of energy systems.
Learning Outcomes	At the end of this module learners will be able to: • Identify waste heat recovery systems • Assess the technological impact of incorporating a waste heat recovery device into an existing energy system • Assess the economic impact of incorporating a waste heat recovery device into an existing energy system
Units	Unit 6.3: Waste heat recovery systems Unit 6.4: Economic assessment of waste heat recovery
Readings	Chapter 9 of course textbook
Activity	**Overview**
	• Homework problems
Module 7	**Combined heat and power (CHP)**
Key Concepts	Standard thermodynamic cycles, CHP cycle
Overview	This module introduces the CHP thermodynamic cycle and compares its performance to standard gas or steam cycles.
Aim	The overriding aim of this module is to understand the basic operation of CHP cycles and assess their technological as well as economic advantage compared to standard gas or steam cycles.
Learning Outcomes	At the end of this module learners will be able to: • Understand the basic operation of a CHP cycle • Assess the technological improvement of standard cycles by using CHP • Assess the economic improvement of standard cycles by using CHP
Units	Unit 7.1: Overview of the CHP thermodynamic cycle Unit 7.2: Economic assessment of CHP cycles as compared to standard steam or gas cycles

Readings	Chapter 10 of course textbook
Activity	**Overview**
	• Homework problems • Final exam (comprehensive)

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

MEE599

Advanced Powertrains

Department of Industrial & Mechanical Engineering, School of Engineering

Lebanese American University

Fall Semester ……

Instructor Information

Instructor: Dr. C. Mansour

Office Location: Bassil 203

Telephone: 2433
Office Hours: MWF 10:00 a.m. - 11:00 a.m. or by appointment
E-mail: charbel.mansour@lau.edu.lb
Website:

Course Identification

Course Number: MEE 599
Course Name: Advanced Powertrains
Course Location: Zakhem Engineering 502 - Byblos Campus
Class Times:
Prerequisites: MEE407 Internal Combustion Engines
MEE341 Kinematics and Dynamics of Linkages
MEE302 Energy Conversion
Faculty Web Page:

Course Description/Overview

Fundamentals, design and modeling of conventional and advanced hybrid electric powertrains for a sustainable mobility.

Course Learning Objectives

Course Content Learning Outcomes

This course treats the fundamentals of the longitudinal behavior of road vehicle power trains. It gives a support for analyzing and optimizing the energy consumption and the performance of these power trains.
The conventional powertrains are studied first in order to identify their low efficiency in the real driving conditions. Then, advanced power trains configurations are proposed for moving the road transportation sector into a sustainable mobility. Hybrid electric, battery electric and fuel-cell power train configurations are analyzed in order to identify the potential of each configuration and its potential in reducing energy consumption.
Realistic mathematical models are developed for the components of these power trains (particularly the conventional and hybrid power trains) and they are compiled to complete the vehicle system that is analyzed and used to develop optimized energy management strategies, in order to optimize the energy consumption.
Several case studies are used to exemplify the methodology and show the principles and challenges associated with analyzing and optimizing complex power trains.

Upon successful completion of this course the student is expected to:

1. Be aware to the problems of sustainable mobility, focusing on passenger vehicles
2. Have knowledge about conventional and advanced power train configurations: hybrid electric, battery electric and fuel-cell power trains
3. Identify and enumerate different hybrid drive system configurations
4. Analyse and compute the energy efficiency of conventional and advanced power trains
5. Design and model conventional and advanced power trains on the perspective of computing and optimizing their energy consumption and performance

6. Discuss the advantages and disadvantages with different hybrid configurations.
7. Have knowledge about control strategies for energy optimization of complex power trains
8. Experience in using tools and techniques for placing vehicle power trains into a dynamic of sustainable development

Course Resources

Course Website(s)

Required Course Texts and Materials

The lecture series follow presentations (prepared by the instructor), based on the reference books mentioned below.

Required tools / software / skills

Matlab/Simulink and ADVISOR will be used in solving assignments

Additional References

Ehsani, Gao, Gay and Emadi, CRC Press 2005
Vehicle Propulsion Systems by Guzzella and Sciarretta, Springer (2nd edition)
Propulsion Systems for Hybrid Vehicles by Miller, IEE Power and Energy Series 45
Electric and Hybrid Vehicles, Design Fundamentals by Husain, CRC Press

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

The final grade will be determined based on the following percentages:

Midterm	25%
Project	40%
Final Exam	35%

Course Policies

Structure

Policy

All students must take Exams as scheduled. Failure to take an exam or the final exam during the assigned class period will result in a grade of zero on that test unless the student has personally contacted me and received permission from me to be absent from the test.

Additional Notes

- A student can miss no more than 4 sessions of instruction. By the 5th session, the instructor may ask the student to drop the course.

- Plagiarism: students caught cheating on an exam will receive a grade of Zero on the exam in the first cheating attempt and a warning. Students caught cheating for the second time in the same course will receive an F grade in the course and a second warning. A grade of zero on an exam resulting from cheating must be counted in the student's course grade.
- Any student who receives 3 warnings will be suspended.

Course Schedule

Topic	
1	Energy consumption and environmental impact of modern transportation: - Importance of energy in the society and the world economy - Challenges of world dependence on fossil fuels - Global energy consumption trends - Transportation energy consumption trends - Main solutions to reduce road transport energy consumption
2	Configuration of conventional vehicle powertrains: - Internal combustion engines - Gearbox systems - Engine Flywheel - Clutch systems - Drivelines

	- Differential - Braking systems
3	Conventional vehicle fundamentals: - Dynamic equation of motion - Tire-ground adhesion and maximum tractive effort - Powertrain tractive effort and vehicle speed - Vehicle power plant and transmission characteristics - Vehicle performance - Operating fuel consumption - Braking performance
4	Operating conditions of the internal combustion engine in the conventional powertrains: - Energy analysis of conventional powertrains - Energy analysis of internal combustion engines
5	Battery electric powertrain technologies: - Configuration of battery electric powertrains - Performance of battery electric powertrains - Energy analysis of battery electric powertrains
6	Fuel-cell powertrain technologies: - Operating principle of fuel-cells - Configuration of fuel-cell powertrains - Performance of fuel-cell powertrains - Energy analysis of fuel-cell powertrains
7	Hybrid electric powertrain technologies: - Engine stop/start during idling - Brake energy recovery - Electric boosting during accelerations - Management of the engine operating points and power-splitting

	- Driving in electric mode - Energy management strategies
8	Stop/start hybrid powertrains: - Configuration of stop-start powertrains - Energy management strategy - Sizing of the power train components - Verification of the vehicle performance - Fuel consumption
9	Series hybrid powertrains: - General concept of hybrid electric power trains - Configuration of series powertrains - Advantages and disadvantages of series powertrains - Energy management strategy - Verification of the vehicle performance - Sizing of the series powertrain components - Design example of series hybrid powertrains - Efficiency of series hybrid powertrains - Fuel consumption of series hybrid powertrains
10	Parallel hybrid power trains: - Configuration of parallel powertrains - Energy management strategy - Sizing of the powertrain components - Verification of the vehicle performance - Fuel consumption
11	Series/parallel hybrid powertrains: - Configuration of series/parallel powertrains - Energy management strategy - Sizing of the power train components - Verification of the vehicle performance

	- Fuel consumption
12	Fundamentals of regenerative braking: - Energy consumption in braking - Braking power and energy on front and rear wheels - Brake strategies for electric and hybrid electric vehicles - Antilock brake system (ABS)

APENDIX II: The CLIMASP Course Modules Template Example

Course	Advanced Powertrains
Module 1	Energy consumption and environmental impact of modern transportation
Key Concepts	Energy consumption, GHG/pollutants emissions, regulations and protocols to reduce transport emissions.
Overview	At a time where most of the world energy consumption derives from the combustion of fossil fuel, there is a growing concern that the peak oil production may be reached in the near future. The peak oil concept predicts that the world has consumed almost half of the oil reserves; consequently, with the forecasts of increasing energy consumption demand, the world will be facing a decrease in oil production, resulting in severe oil price increases. Therefore, the world's energy consumption has to move away from fossil fuels, in order to guarantee the security of energy supply, and the environmental concerns related to global warming and air pollution. The overall picture of energy consumption by sectors shows that the transportation sector accounts for one third of the total world energy consumption, with a predominance in the consumption of oil to over 96%. Therefore, the evolution of energy consumption in transportation is crucial in guaranteeing sustainable mobility, and passenger road transportation, is the key sector to manage the energy consumption trend.
Aim	This module presents an introduction on the world energy consumption and GHG/pollutants emissions of the different modes of transport. It highlights the high dependency of transport on petroleum oil products, and emphasizes the need to reduce fuel consumption in this sector, particularly the passenger

	vehicles.
Learning Outcomes	At the end of this module learners will be able to: • Assess energy consumption and emissions per transport modes • Demonstrate knowledge on protocols and regulations to reduce GHG emissions and pollutants • Identify mitigation options to reduce transport energy consumption
Units	Chapter 1: Energy consumption and environmental impact of modern transportation.
Readings	The instructor's notes and the reference books.
Activity	**Overview**
Module 2	Conventional Vehicles Fundamentals
Key Concepts	gasoline and diesel powertrains
Overview	This module presents the mathematical modeling of conventional vehicle operation fundamentals, in order to emulate the vehicle performance and fuel consumption under different driving conditions. The effort to improve the fuel economy of conventional vehicles has been an ongoing process in the automotive industry. Despite all the efforts, conventional powertrains still remain inefficient. The second part of the module analyzes the energy consumption of these powertrains in their various stages of use, and pinpoints the within sources of energy losses.

Aim	The aim of this module is to learn the modelling of conventional powertrains in order to assess the energy consumption under different driving conditions.
Learning Outcomes	At the end of this module learners will be able to: • Identify the sources of energy losses within conventional powertrains • Elaborate a mathematical model of conventional powertrains
Units	Chapter 2: Configuration of conventional vehicle powertrains Chapter 3: Conventional vehicle fundamentals Chapter 4: Operating conditions of the internal combustion engine in the conventional powertrains
Readings	The instructor's notes and the reference books.
Activity	**Overview**
	Project: Modeling of a conventional powertrain using Matlab/Simulink.
Module 3	Electric and Fuel-Cell Vehicles Fundamentals
Key Concepts	Battery electric vehicles, Hydrogen fuel-cell vehicles.
Overview	Among the potential alternative powertrains to reduce energy consumption are electric and fuel-cell vehicles. Although these powertrains show high tank-to-wheel energy efficiency, their future still faces barriers to overcome in the short and medium terms, depending primarily on technological improvements of the energy storage systems on-board, and the infrastructure for electricity and hydrogen supply. This module presents the configurations and the well-to-wheel energy analysis of battery electric and hydrogen fuel-cell vehicles.

Aim	This module aims at examining the configurations and the well-to-wheel energy analysis of battery electric and hydrogen fuel-cell vehicles.
Learning Outcomes	At the end of this module learners will be able to demonstrate knowledge on the fundamentals of battery electric and hydrogen fuel-cell vehicles.
Units	Chapter 5: Battery electric powertrain technologies. Chapter 6: Fuel-cell powertrain technologies.
Readings	The instructor's notes and the reference books.
Activity	**Overview**
	Midterm exam covering modules 1 to 3.
Module 4	Hybrid Electric Vehicles Fundamentals
Key Concepts	Hybrid electric vehicles.
Overview	As discussed in module 2, conventional vehicles present poor fuel economy and high environmental pollution. According to module 3, electric and fuel-cell vehicles show advantages over conventional vehicles in terms of energy savings and zero environmental pollution; however, the performance, especially the operation range per battery charge, is far less competitive than conventional vehicles, due to the lower energy content of the batteries compared to the energy content of gasoline. Hybrid electric vehicles, which use two power sources: an internal combustion engine and an electric machine, have the advantages of both conventional and electric vehicles, and overcome their disadvantages. This module focuses on the concept, powertrain configuration, control strategy

	and operation principles of hybrid electric vehicles.
Aim	This module aims at understanding the fundamentals and energy analysis of hybrid electric powertrains.
Learning Outcomes	At the end of this module learners will be able to: • understanding the fundamentals of hybrid electric vehicles • modeling hybrid electric powertrains • assess and optimize energy consumption of hybrid vehicles
Units	Chapter 7: Hybrid electric powertrain technologies. Chapter 8: Stop/start hybrid powertrains. Chapter 9: Series hybrid powertrains. Chapter 10: Parallel hybrid power trains. Chapter 11: Series/parallel hybrid powertrains. Chapter 12: Fundamentals of regenerative braking.
Readings	The instructor's notes and the reference books.
Activity	**Overview**
	Project: Modeling of hybrid electric powertrain using Matlab/Simulink. Final exam covering module 4.

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

CIE 526

Environmental Remediation

Department of Civil Engineering, School of Engineering

Lebanese American University

Spring Semester ……

Instructor Information

Instructor: Dr. Mazen M. Haydar
Office Location: Zakhem 502 - Byblos
Telephone:
Office Hours: After class
E-mail: mazen.haydar@lau.edu.lb
Website:

Course Identification

Course Number: CIE 526
Course Name: Environmental Remediation
Course Location:
Course Time: MW 6:00 – 7:15

Prerequisites: None
Faculty Web Page:

Course Description/Overview

This course deals with characterization of pollution in the groundwater, soil and air and developing processes based on physical, chemical and biological transformations to return contaminated environments, such as polluted waters, soils and air, to their natural conditions. The control, optimization and monitoring of environmental remediation is discussed as well as the environmental factors and mechanisms involved. In-situ and ex-situ applications are emphasized in this course.

Course Learning Objectives

The main objective of this module is to identify pollutants of concern in the groundwater, soil and air, how to investigate and characterize the extent of contamination and to identify applicable remediation measures. The course also addresses developing measures for pollution prevention and waste minimization.

Course Content Learning Outcomes

At the conclusion of this course, each student will be able to do the following:

1. Learn about water sampling techniques and how to characterize and delineate sources of groundwater contamination
2. Identify applicable remedial technologies for groundwater contamination
3. Characterize soil contamination and propose remedial solutions to address soil contaminated sites
4. Identify the main sources of air pollution and estimate emissions of pollutants.
5. Know the main standards regulating air pollution and identify applicable air pollution control technologies: particulate controls and gas controls.
6. Identify pollution prevention and waste minimization controls in various stages of a given project or design.

Course Resources

Required Course Texts and Materials

Required Resources:

Selected Readings from:
Handbook of Complex Environmental Remediation Problems, Jay Lehr, Marve Hyman, Tyler Gass, and William Seevers, McGraw-Hill, 2001.

Optional Course Texts and Materials

None.

Assignments and Grading Scheme

Grading System

Grading Policy

Evaluation of the student's final grade in the course will be based on his/her performance throughout the course and will be a combination of the following:

Item Percentage
Term Paper (final report 15%, oral presentation 5%) 20%
Test 1 20%
Test 2 20%
Comprehensive Final Exam 40%

Completion of the online course evaluations is required. Students will not be able to access their course grades until they have completed the course evaluations.

Course Policies

Structure

Lecture:	Two 75-minute lectures per week
Laboratory:	None
Medium:	All material explained in class and on the whiteboard
Tests:	2 Tests-75 minutes - closed book
Final:	120 minutes, comprehensive, closed book
Term Paper:	Final report to be submitted, followed by a Class oral presentation.

Policies

Attendance
You are expected to attend all classes and arrive on time. Obtain prior clearance for planned absences.
Academic Integrity
The instructor will adhere to all LAU policies regarding academic integrity as stated http://www.lau.edu/policies.
Homework Policy
Assignments must be typed and must be turned in at the beginning of class on the day it is due, with no exceptions.
Exam Policy
No make-up for a test or a final will be given under any circumstance. In case of absence, the grade of the exam will be considered to be zero.
Cheating
Students caught cheating on an exam receive a grade of zero on the exam.

Course Schedule

Topic	Description
1	Groundwater Characterization
2	Investigative Methods
3	Water Sampling
4	Remedial Methods for Groundwater Contamination
5	Soil Characterization
6	Methods for Remediating Soil Contamination
7	Overview of Air Quality Regulations
8	Air Pollution Control Technologies: Particulate Controls
9	Air Pollution Control Technologies: Gas Controls
10	Pollution Prevention and Waste Minimization: In Design
11	Pollution Prevention and Waste Minimization: In Operation & Maintenance

APENDIX II: The CLIMASP Course Modules Template Example

Course	Environmental Remediation
Module 1	**Groundwater**
Key Concepts	Groundwater contamination, groundwater characterization, installation of groundwater monitoring wells, investigative methods and remedial methods.

Overview	In this module, we will explore why groundwater contamination is so important? What are the sources of groundwater pollution? What is the hydrology of contamination? What aspects of geochemistry are important in understanding groundwater pollution? What are the effects of these compounds on human health and the environment? What are the chemicals that have the greatest impact on groundwater? We will also explore investigative methods for dense and light non-aqueous phase liquids. Finally, we will present various remedial methods that can be applicable for DNAPLs and LNAPLs and discuss several case studies on this subject.
Aim	The main objective of this module is to understand groundwater characterization of groundwater pollution, identify the important pollutants of concern and explore respective remedial methods.
Learning Outcomes	The student shall be able to: • Determine the main groundwater contaminants of concern • Learn about water sampling techniques • Learn how to characterize and delineate source of contamination • Identify applicable remedial technologies for groundwater contamination
Units	1.1 –Groundwater Characterization 1.2 –Investigative Methods 1.3 –Remedial Methods 1.4 – Case Studies
Readings	Chapter 1 *Handbook of Complex Environmental Remediation Problems, Jay Lehr, Marve Hyman, Tyler Gass, and William Seevers, McGraw-Hill, 2001.*
Activity	Assignment: • Read the below article in order to analyze the transport and fate of contaminants. Project: • Prepare a term paper that addresses the remedial action plan implemented at a groundwater contaminated site. The paper must address the strategy

	for characterizing the pollution, the sampling plan and the remedial technology used at this site.
Module 2	**Soil Contamination**
Key Concepts	Delineation of soil contamination, soil characteristics, and remediating soil contamination.
Overview	In this module, we will introduce the soil characteristics, the soil mineralogy and organic matter. We will explore the characteristics of contaminants, chemical speciation, cation exchange capacity, and analytical challenges. We will discuss the field investigative methods to characterize soil contamination and present soil sampling techniques. Furthermore, we will evaluate the various methods for remediating soil contamination such as phytoremediation, thermal applications, chemical and biological reaction, separation, and mobilization and extraction.
Aim	The main objective of this module is to introduce soil characteristics, investigate soil contamination and propose respective remedial methods.
Learning Outcomes	The student shall be able to: • Characterize soil contamination • Propose remedial solutions to address soil contaminated sites
Units	2.1 – Soil Characteristics 2.2 – Characterization of Soil Contamination 2.3 – Remediation of Soil Contamination
Readings	Chapter 2 *Handbook of Complex Environmental Remediation Problems, Jay Lehr, Marve Hyman, Tyler Gass, and William Seevers, McGraw-Hill, 2001.*
Activity	Project: • Prepare a term paper that addresses characterization and remedial action of soil contaminated sites.
Module 3	**Discharge of Hazardous Waste into the Atmosphere and their impact on Climate Change**
Key Concepts	Air quality standards, air pollution control technologies, and air dispersion modeling.
Overview	This module will introduce sources of pollutants emitted into the atmosphere,

	hazardous air pollutants and estimation of toxic emissions. We will present the provisions for attainment and maintenance of NAAQS and national emission standards. We will explore dispersion modeling, its objectives, procedure and limitations. We will address air pollution control technologies that are divided into particulate controls and gas controls. Particulate controls such as cyclones, particulate scrubbers, filters, etc. will be presented. Gas controls such as absorption, adsorption, incineration, biofiltration, etc. will be presented as well. Finally, we will discuss the impact of climate change on the development of remediation projects and the technological advances in remediation needed to control degradation of air quality. Reciprocally, we will explore the impact of remediation on reducing the impact of climate change.
Aim	The main objective of this module is to explore the main sources of air pollutants and how to estimate their emissions and recommend respective remedial technologies, specifically particulate and gas controls.
Learning Outcomes	The student shall be able to: • Identify the main sources of air pollution and estimate emissions of pollutants. • Know the main standards regulating air pollution • Understand air dispersion modeling • Know about air pollution control technologies: particulate controls and gas controls.
Units	3.1 –Sources of Hazardous Chemicals Emitted into the Atmosphere 3.2 – Overview of Air Quality Regulations 3.3 – Dispersion Modeling 3.4 – Air Pollution Control Technologies: Particulate Controls 3.5 – Air Pollution Control Technologies: Gas Controls
Readings	Chapter 3 *Handbook of Complex Environmental Remediation Problems, Jay Lehr, Marve Hyman, Tyler Gass, and William Seevers, McGraw-Hill, 2001.*

Activity	Project: • Prepare a term paper that addresses control of hazardous air pollutants from industrial facilities. • Prepare a term paper that addresses the relationship between the formulation of climate change policies and regulations on the progress of environmental remediation. • Prepare a term paper that addresses the impact caused by air pollution and discharge of chemical pollutants on climate change.
Module 4	**Pollution Prevention and Waste Minimization**
Key Concepts	Pollution prevention, waste minimization, and environmental restoration.
Overview	In this module, we will introduce the main techniques and benefits of pollution prevention and waste minimization. When does pollution prevention apply? Which methods can be used for identifying pollution prevention opportunities in design? We will also explore methods and possible opportunities for environmental restoration.
Aim	The main objective of this module is to introduce key pollution prevention and waste minimization controls that can be implemented during design, operation and for environmental restoration.
Learning Outcomes	The student shall be able to: • Identify pollution prevention and waste minimization controls in various stages of a given project or design.
Units	4.1 – Pollution Prevention and Waste Minimization in Design 4.2 – Pollution Prevention and Waste Minimization for Maintenance & Operations 4.3 – Pollution Prevention and Waste Minimization in Environmental Restoration
Readings	Chapter 12 *Handbook of Complex Environmental Remediation Problems, Jay Lehr, Marve Hyman, Tyler Gass, and William Seevers, McGraw-Hill, 2001.*
Activity	Project: • Prepare a term paper that addresses the use of design, permits,

	environmental management and other preventive measures to reduce or control pollution.

APENDIX I: The CLIMASP Transportation Planning and Land Use Course Description

CLIMASP Course Syllabus

Course Number:
Transportation Planning and Land Use

Lebanese American University,
School of Engineering, Department of Civil Engineering,
Semester, 20XX

Instructor Information

Instructor: Dr. John Khoury
Office Location: Bassil 303, Byblos Campus
Telephone: Office: 09-547262 ext 2170
Office Hours:

E-mail: john.khoury@lau.edu.lb
Website:

Course Identification

Course Number: CIE563
Course Name: **Transportation Planning and Land Use**
Course Location: Byblos Campus
Class Times:
Prerequisites:

Course Description/Overview

Transportation planning and land use provides transportation engineers and planners with the latest knowledge, skills and tools needed to understand, plan, develop and maintain sustainable transportation practices.

This course addresses today's issues in sustainable transportation and benefits the safety, health and welfare of the public. Students will learn how to implement programs that encourage mixed use and higher density levels, develop environmental solutions to improve land use planning, review what makes a community liveable and evaluate transportation system life cycles. Interaction between transportation and land use variables, including modelling requirements, impacts, and data needs within the context of good community planning and economic development; transportation management, administration, finance, system evaluation, implementation, and integration. In addition, the student will explore the positives and negatives affecting liveability. The student will learn about sprawl and compact cities, energy issues and environmental quality, transit-oriented and traditional neighbourhood development, and mixed-use and mixed income developments. Context sensitive solutions to transportation projects will also be covered.

The course is divided into two focus areas:

- Planning and land use for liveable communities

- Environmental Issues and Impacts with economic burdens

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

121. Define the main elements of planning of transportation constructed facilities
122. Understand the travel demand forecasting model
123. Develop and evaluate alternatives for liveable communities
124. Understand the impacts of alternatives on users, environment and socio-economic balance

Course Resources

Course Website(s)

Required Course Texts and Materials

- Hands-out prepared by the instructor for the class

Optional Course Texts and Materials

- Material present at the FHWA website for planning and land use (Influence of transportation infrastructure on land use), found at: https://www.fhwa.dot.gov/planning/processes/land_use/references/tranlanduse.cfm

- Case studies of land use: https://www.fhwa.dot.gov/planning/processes/land_use/case_studies/

- Tools and practices for land use integration: https://www.fhwa.dot.gov/planning/processes/land_use/land_use_tools/
- FHWA Travel Model Improvement Program at:

https://www.fhwa.dot.gov/planning/tmip/about/strategic_plan/page00.cfm
- Reports by the TMIP force under the DOT:
https://www.fhwa.dot.gov/planning/tmip/resources/sponsored_reports.cfm

Assignments and Grading Scheme

Grading System

All assignments are graded over 100

Grading Policy

Evaluation of the student's final grade in the course will be based on his/her performance throughout the course and will be a combination of the following:

Item	Percentage
Assignments/class attendance	10
Project/Presentation	20
Mid-term Exam	30
Final Exam	40

Project

The project is a major part of your course grade. You will select a topic of interest that relates to the field of study and a current industry problem, including:

- Alternative mode study and application
- Travel demand management applications and evaluations
- Transit oriented land-use designs
- Environmental issues
- Energy issues

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

This is a seminar type of course, which means that students are expected to come to ALL classes. You cannot pass the class under any circumstances if you miss more than five classes. Students are expected to arrive on time and stay until the class period ends. If you know that you have to leave early, you should notify me before class starts. You are expected to treat faculty and other students with respect. During class students are obliged to

not disrupt class by making noise and/or leaving and re-entering during class. Students who violate these minimal expectations will be asked to leave and counted as absent. You are expected to have read and thought about the assigned material before you come to class. I expect active class participation, which counts for 10% of the grade.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

APENDIX II: The CLIMASP Transportation Planning and Land Use Course Modules

Course	**Transportation Planning and Land Use**
Module 1	Urban Transportation Problems Overview
Key Concepts	Transportation problems, Planning philosophies and framework
Overview	This module talks about the different transportation issues faced in an urban setting. The symptoms of such problems are detailed along with the sources. Then the planning approach needed to solve such issues is introduced through the "Continuing Urban Transportation Planning Process" framework.
Aim	The aim of this module is to introduce students to issues they have to think off when discussing urban transportation problems and the corresponding planning requirements to solve them. Then the "travel demand forecasting" framework is briefly discussed and the data requirements are highlighted
Learning Outcomes	At the end of this module learners will be able to: Describe the urban transportation issues, their key identifiers and the urban planning framework needed to assess such issues on a continuing basis
Readings	Course hand-outs and reference material assigned in class
Activity	Overview Assignment 1: once familiar with the urban planning framework, develop a

	survey tool to address a certain transportation problem in your city.
Module 2	Travel Demand Forecasting
Key Concepts	Four step process, generation, distribution, mode choice, route assignment
Overview	This module talks about the four steps used in the overall transportation planning and forecasting problem. After the problems have been identified and the data collected about the region, the trip generation, distribution, mode choice and route choice process starts, which are at the heart of the Urban Transportation Planning framework.
Aim	The aim of this module is to introduce students to the four steps needed to conduct a transportation forecasting exercise for a region
Learning Outcomes	At the end of this module learners will be able to: Describe the urban transportation forecasting and demand projection model
Readings	Course hand-outs and reference material assigned in class
Activity	Overview Assignment 1: Trip generation example Assignment 2: Trip distribution example Assignment 3: Mode choice example Assignment 4: Route distribution example
Module 3	Alternatives Development and Strategic Evaluation
Key Concepts	Alternative development, evaluation framework
Overview	This module talks about the comprehensive transportation alternative development process and the relationship between evaluation and other planning activities. This describes the characteristics of modal alternatives, their local context in terms of goals, the concerns of the decision makers and other stakeholders, and other administrative requirements
Aim	The aim of this module is to introduce students to the full range of

	transportation alternatives in terms of modal choices and their impacts on the region
Learning Outcomes	At the end of this module learners will be able to: Describe the principles for modal alternatives development, their impacts and issues related to sensitivity of the results
Readings	Course hand-outs and reference material assigned in class
Activity	Overview Project: students will be asked to start the course project in order to later develop alternatives
Module 4	Cost of Alternatives
Key Concepts	Capital costs, Operating costs, Maintenance costs
Overview	This module talks about the comprehensive list of costs associated with the major transportation alternatives selected for analysis. Students will be introduced to typical unit costs for various types of urban transportation actions from the Characteristics of Urban Transportation Systems (CUTS), which is periodically updated by the Federal Transit Administration (FTA). These unit costs can be used to provide approximate estimates of the capital, operating, and maintenance costs of sketch-planning alternatives, subject to the caveats noted in the accompanying discussions.
Aim	The aim of this module is to introduce students to the full range of transportation project costs
Learning Outcomes	At the end of this module learners will be able to: Describe the segment unit costs for the selected transportation alternatives
Readings	Course hand-outs and reference material assigned in class
Activity	Overview Project: students will be asked to assess the costs of the various alternatives they developed for their urban transportation issue
Module 5	Impacts on transportation system users

Key Concepts	User benefits, user costs, capital costs
Overview	This module talks about the various components of user costs and benefits described previously usually makes up the major component of the economic efficiency measures in the overall evaluation. The major categories of user effects are: Time spent in travel; "out of pocket costs" including fares, tolls, parking charges; direct user borne vehicle operating costs (excluding transit operating costs); accident costs; comfort and convenience; accessibility; costs and benefits of induced or discouraged travel.
Aim	The aim of this module is to introduce students to the full range of transportation user costs and allow them to understand the difference of this cost category from the project costs.
Learning Outcomes	At the end of this module learners will be able to: Describe the different user costs for the selected transportation alternatives
Readings	Course hand-outs and reference material assigned in class
Activity	Overview Project: students will be asked to assess the user related costs of the various alternatives they developed for their urban transportation issue
Module 6	Energy, environment, and Socio economic impacts
Key Concepts	Energy issues, socio-economic impacts, environmental impacts
Overview	Transportation alternatives can affect energy required for vehicle propulsion, maintenance, and the construction of guide ways, stations, and vehicles. Transportation alternatives also can affect energy consumption through second round effects such as employment shifts to or from the suburbs, changes in auto ownership, and the use of autos left home by car-poolers or transit riders. Socio-Economic Impacts of construction and use of transportation facilities include: employment and other implications from construction and operation of transit services, land use changes and their impacts, economic development implications

Aim	The aim of this module is to introduce students to the full range of transportation alternative impacts of the society, environment, and the energy sector.
Learning Outcomes	At the end of this module learners will be able to: Describe the many impacts a major urban transportation project has and find ways to assess such impacts
Readings	Course hand-outs and reference material assigned in class
Activity	Overview Project: students will be asked to assess the energy issues, socio-economic impacts, environmental impacts of the various alternatives
Module 7	Overall merit and fairness/equity analysis
Key Concepts	Energy issues, socio-economic impacts, environmental impacts
Overview	This module will introduce the comprehensive evaluations will call for impact measures relating to: overall economic worth, environmental implication, equity, financial feasibility, legal and administrative feasibility, and social acceptance. Questions will be raised about the sensitivity of findings to uncertainties and value based assumptions, and the adequacies of alternatives and impacts considered. One key element of transportation decision-making is that many impact measures contain subject judgments: value of time, safety, comfort, quality of life, etc.
Aim	The aim of this module is to allow students to assess whether the costs of improvements are justified by the anticipated benefits, understand key differences among alternatives, and assess the distribution of the costs and benefits among the affected groups to answer the questions about fairness.
Learning Outcomes	At the end of this module learners will be able to: Describe the overall merit of major urban transportation project
Readings	Course hand-outs and reference material assigned in class
Activity	Overview Project: students will be asked to assess the overall merit of the selected

	alternative out of the various alternatives they developed and studied, using the STEAM software (Surface Transportation Efficiency Analysis Model)

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number: CIE582/782

Infrastructures Management

Lebanese American University, Faculty of Engineering, Department of Civil Engineering

Fall Semester, 2014

Instructor Information

Instructor: Dr. Gebran Karam

Office Location: Bassil hall office 305

Telephone: Office – +961 9 547254

Office Hours: MWF 2:00 to 3:00 pm and 5:00 to 6:00 pm

E-mail: gkaram@lau.edu.lb
Website: WWW.LAU.EDU.LB

Course Identification

Course Number: CIE582 / 782
Course Name: Infrastructures Management
Course Location: University Campus
Class Times: MWF 1:00 to 1:50pm
Prerequisites: Construction Management

Faculty Web Page: WWW.LAU.EDU.LB

Course Description/Overview

General methods of engineering systems management and the different types of infrastructure. Application of different methods for the planning and analysis of complex infrastructure projects considering possible financing alternatives, engineering solutions, and overall management issues during the life cycle of the project. Review of selected case studies

Course Learning Objectives

The material in this course is structured and focused on the course learning outcomes. Assigned student work and graded student performances are based on the course learning outcomes. These outcomes are assumed to be attained by the students when 70% or more of the students (not counting withdrawals) pass the course.

Course Content Learning Outcomes

On the successful completion of this course, you will be able to:

1. Describe the issues involved in managing infrastructure facilities and systems as assets

2. Demonstrate an understanding of the methods, tools, and other resources available for infrastructure management
3. Demonstrate an understanding of the evolving institutional contexts for implementing asset management programs
4. Demonstrate an understanding of the basics of financial planning for infrastructure systems and the evolving financial instruments available
5. Conceptually design a management system for a selected facility and system
6. Conduct evaluations to determine the relative effectiveness of various management systems
7. Demonstrate an understanding of the ethical, environmental, legal, societal, and political issues involved in the development of new infrastructure systems and the management and maintenance of mature infrastructure systems.
8. Examine the importance of infrastructure choices and use the principles of engineering communications (written, oral, and visual) to present your findings.

Course Resources

Course Website(s)

http://en.wikipedia.org/wiki/Infrastructure_asset_management
http://www.fhwa.dot.gov/infrastructure/asstmgmt/amppinf.cfm
http://www.ibi.ethz.ch/research/im/research/index_EN
http://www.fcm.ca/home/programs/past-programs/infraguide.htm
https://www.fcm.ca/.../Managing_Infrastructure_Assets_EN.pdf
http://www.hdmglobal.com/

Required Course Texts and Materials

Reading material will be assigned in classand handouts prepared by the instructor for the class.

A preliminary list of suggested references and readings is as follows:
Books:
1-Principlesof Public and Private Infrastructure Delivery – by John B. Miller - - 2000
2-Water, Wastewater, and Stormwater Infrastructure Management by Neil S. Grigg - 2012

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 4 (where 2 is the least pass mark)

Grading Policy

Grades can be based on the following: (Example)
The course grade is calculated according to the following:

Written tests / projects/ presentations	60%
Class discussions participation and assignments	10%
Final	30%
Total Points	**100**

Course Policies.

Classroom Protocol

1-Attendance of all scheduled lectures and additional sessions is mandatory
2-Computer literacy and access to internet are required and non-negotiable.
3-Self learning is a key to continuous self-development and professional improvement; through the assignments and projects, this course will try to create conditions and situations where individuals or teams will be caused to research, collect, study and synthesize information in order to acquire knowledge, know how, and design skills.

4-All students are supposed to be proficient in oral and written English communication skills. Presentation, language, and professionalism will be considered in the grading of assignments, projects, and all other course work.
5-Honesty on Assignments, Projects, Exams, and Course work:
You will be assigned individual and group work. You are also welcome, and encouraged, to work on assigned individual problems and projects with fellow students. A good way to learn the material is in small study groups. Such groups work best if members have attempted the problems individually before meeting as a group. Of course, the assignment solution, project, or work, that you turn in should reflect your own understanding, and not that of your fellow students. In other words, do not copy directly from other students. If it is obvious that such direct copying has occurred, we will disallow that homework. Individual work is required on all examinations taken in class.
Working groups will be formed at the beginning of the semester and will be asked to carry multiple assignments culminating in oral presentation and the submittal of written reports.
By attending lectures, taking exams, and presenting their work for grading all students are implicitly assumed to have read and agreed with all of the above.
As a general rule no make-up exams will be allowed. Class attendance and participation will be evaluated and included in the course grade.

Relationship of course to Program Outcomes

This course is related to the following program outcomes:

1. Delivery and Assessment of Program Outcomes: (g) ability to communicate effectively. Specifically: the ability to write documents with the context, organization, format and style fitting the intended reader and purpose; and the ability to deliver orally a presentation with timeliness, credibility, and engagement that achieve desired outcomes. (j)a knowledge of contemporary issues. Specifically the ability to identify several contemporary issues and the ability to describe the impact of contemporary issues on engineering activities.

   Assessment is accomplished in class for the communications program outcome (g) and through questions for outcome (j), similar in format to the FE examination, on the final exam. Questions are approved by the Program Assessment Committee. Attained by the students when 70% or more of the students score 70% of the points allocated to questions.

Delivery of Program Outcome: (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context. Specifically the knowledge of the impact of engineering solutions ina global, economic, environmental, and societal context, and the comprehension of the impact of engineering solutions in a global, economic, environmental, and societal context

Important Dates to Remember

Topics covered and course schedule

Week	**Topic**
Week 1	Definition and types of infrastructure systems.
Week 2-3	Planning and economic decision models.
Week 3-4	Financing and delivery methods.
Week 5	Decision support systems, GIS, and knowledge mining.
Week 6-7	Examples of infrastructure management systems: transportation networks, telecommunications, water and wastewater, emergency response systems…
Week 8	Role of the civil engineer in the 21st century and Sustainability issues.
Week 9-10	Climate change and global environmental issues.
Week 10-14	Assigned case studies and projects discussion

APENDIX II: The CLIMASP Course Modules Template Example

Course	Curriculum and Hypermedia
Module 1	Curriculum definition and Types of Infrastructure
Key Concepts	Infrastructure Assets, Systems, Public and Private Utility Service Delivery
Overview	Ask the students what is Infrastructure in their opinion, define infrastructure, describe the different types of infrastructure systems in civil engineering, list the different systems, discuss the ownership and history of utilities, public versus private
Aim	Identify and describe elements, assets, and systems of infrastructure and list their types and form as public or private utilities
Learning Outcomes	Describe infrastructure assets and systems and their types
Units	N/A
Readings	As assigned
Activity	Class open discussion, followed by reading and some research to develop interactively the required definitions and descriptions before reviewing the pertinent literature
Module 2	Curriculum Planning and Economic Decision Models
Key Concepts	Life Cycle of System, Planning and conceptualization, Financial and Economic Evaluation
Overview	Define life cycle , identify planning and conceptualization as the first steps, review financial based and economic based evaluation models for infrastructure system feasibility
Aim	Describe and use different types of financial and economic evaluation models
Learning	Evaluate the financial and/or economic feasibility of system or component

Outcomes	
Units	N/A
Readings	As assigned
Activity	**Overview**
	Class open discussion, followed by review of engineering economics concepts followed by financial vs economic criteria, pick one example of infra such as a road system and develop vehicle operating cost concept and compare analyses.
Module 3	Curriculum and Financing and delivery methods
Key Concepts	Financing, taxes, loans, privatization , BOT / BOOT, PPP
Overview	Review of sources of financing for public, private, or public/private infrastructure, and exploration of different delivery methods for the construction and operation such as BOT, BOOT, PPP
Aim	Identify sources of financing for a public utility infrastructure system,
Learning Outcomes	Ability to suggest most appropriate financing scheme and to suggest delivery method for an infra system or component
Units	N/A
Readings	As assigned
Activity	**Overview**
	Class open discussion, review of available funding sources to finance a public infra project such as taxation, loans, or private funding sources and discussion of the connected delivery method to each project (public works governmental contracts, BOT, etc..); open discussion on the applicability of PPP to different types of projects
Module 4	Decision support systems, GIS, and knowledge mining

Key Concepts	Physical and Financial Modeling of Systems, GIS, and statistical analysis and databases mining and management
Overview	Introduction of the types of decision support systems, models, review of GIS concepts and data mining
Aim	Discuss and identify the key components of required decision support systems for the management and operation of any infra system
Learning Outcomes	Ability to conceptually design and specify the decision support systems required and their types for a given infrastructural system
Units	N/A
Readings	As assigned
Activity	**Overview**
	Class open discussion, review the key operations of any generic infra system and identify the types of decision support systems required, the types of IT and software, read and discuss about actual cases that use SCADA, GIS, specific O&M system models (water infra and road infra), financial operations software, inventory management, customer management databases. Group assignment to design and specify requirements for a selected type of utility or infrastructure system; presentation and discussion with class
Module 5	Examples of infrastructure management systems: transportation networks, telecommunications, water and wastewater, emergency response systems…
Key Concepts	Assets, Systems, Services delivered, Valuation of services, O&M, Efficiency
Overview	Detailed description and comparison of existing infra management solutions at the international and local level
Aim	Develop an understanding of current working models of infrastructure systems within their national, economic, and environmental contexts; identify their critical features and impacts on quality and efficiency of

	service and their current sustainability
Learning Outcomes	Understand how infrastructure systems are operated and what are their management and operations/maintenance issues depending on their geographic, social, political and economic contexts; and determine the relative effectiveness of various management systems
Units	N/A
Readings	As assigned
Activity	**Overview**
	Class open discussion, review of assigned readings on transportation, water, power, telecom, and other infrastructure systems; establishment of comparisons between different management and operations models; identification and discussion of generic issues and of contextual parameters and issues; discuss applicability of different models to the local and regional context given their particular environmental, social, economic, and political contexts as compared to models adopted in North America and Europe; Group assignment
Module 6	Role of the civil engineer in the 21st century and Sustainability issues
Key Concepts	Civil engineering challenges in modern times, environmental and economic sustainability
Overview	Presentation of the challenges of civil engineering in the coming century with emphasis on sustainability and the various issues surrounding it as pertaining to infra systems management
Aim	Develop an understanding of the challenges of practicing civil engineering in the 21st century and of the ethical, environmental, legal, societal, and political issues involved in the development of new infrastructure systems and the management and maintenance of mature infrastructure systems with particular emphasis on sustainability
Learning Outcomes	Demonstrate an understanding of the challenges of practicing civil

	engineering in the 21st century and of the ethical, environmental, legal, societal, and political issues involved in the development of new infrastructure systems and the management and maintenance of mature infrastructure systems with particular emphasis on sustainability
Units	N/A
Readings	As assigned
Activity	**Overview**
	Class open discussion, followed by presentation of the multidimensional framework of sustainability within which all infra systems must be inscribed; presentation and discussion of the ethical, environmental, legal, societal, and political issues involved in the development of new infrastructure systems and the management and maintenance of mature infrastructure systems; re-formulation of the mission of civil engineering as a steward to the environment and a guarantor of the well-being of communities and their economic prosperity and sustainability; Group assignment
Module 7	Climate change and global environmental issues
Key Concepts	Climate change, global warming, desertification, environmental challenges and constraints
Overview	Presentation of the global challenge of climate change and its environmental impacts and the interaction between human activities and climate change and their direct impact on the design and management of infra systems
Aim	Develop an understanding of the interaction between human activities and their global impact such as climate change and environmental degradation
Learning Outcomes	Demonstrate an understanding of the impact of human activities on climate change and global warming and integrate their constraints within the development and management of infrastructure systems
Units	N/A

Readings	As assigned
Activity	**Overview**
	Class open discussion, review of the debate on global warming leading to the issue of climate change and its impacts on the different types of infrastructure systems at the level of design, operations and management; discussion of the probable causes of climate change and the cumulative impact of human economic development and the role of the supporting infrastructures in that; Student research and presentation of findings in report or power point format pertaining to one particular type of infrastructure

Module 8	Assigned case studies and projects discussion
Key Concepts	Strategic infrastructure management plan
Overview	Design and development of a strategic infrastructure management plan through a guided group project integrating all concepts learned
Aim	Integrate all concepts learned and researched into one strategic development plan for a select infrastructure system with recommendations as to financing, delivery, management objectives, decision support systems, and life cycle sustainability and global impact
Learning Outcomes	Examine the importance of infrastructure development choices and use the principles of engineering as well as financing, project management and delivery, and systems design to map out a strategic development plan for one infrastructure system integrating all constraints and the multi-dimensional issues related to sustainability and global climate change
Units	N/A

Readings	N/A
Activity	**Overview**
	Guided project development on the basis of groups of no more than 4 students culminating in one power point oral presentation and the submission of a final report. The presentation are made to the whole class and discussed afterwards

Groundwater Hydrology and Pollution (CIE600) Course Syllabus

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

CIE 600

Groundwater Hydrology and Pollution

Department of Civil Engineering, School of Engineering

Lebanese American University

Fall Semester xxx

Instructor Information

Instructor: Dr. Mahmoud Wazne
Office Location: Bassil 301
Telephone: Office
Office Hours: xxx
E-mail: mahmoud.wazne@lau.edu.lb
Website:

Course Identification

Course Number: CIE 600
Course Name: Groundwater Hydrology and Pollution
Course Location: Byblos Campus
Class Times: xxx
Prerequisites: Pre-requisite CIE 322 Hydraulics
Faculty Web Page:

Course Description/Overview

CIE 600 Groundwater Hydrology and Pollution [3-0, 3cr.] The objective of this course is to provide students with a thorough understanding of the subsurface environment as it pertains to the distribution and movement of groundwater and the movement and interactions of contaminants. Pre-requisite: CIE322 Hydraulics.

Course Learning Objectives

1. To provide students with information on groundwater movement and contaminant transport in the subsurface.
2. To equip students with technical tools needed to predict groundwater flow and contaminants transport in the subsurface.

Course Content Learning Outcomes

At the conclusion of this course, each student will be able to do the following:

1. Determine groundwater flow and Darcy's velocity.
2. Differentiate between different types of aquifers.
3. Determine the hydraulic conductivity for isotropic, anisotropic, homogeneous, or heterogeneous aquifer systems.
4. Understand and apply the mathematics of groundwater flow for steady and unsteady flow.
5. Construct flow nets.
6. Calculate well drawdown and aquifer parameters using well hydraulics.
7. Determine groundwater flow in the unsaturated zone
8. Determine pollutant fate and transport in porous media.
9. Understand and apply the principles of groundwater modeling.
10. Groundwater recharge calculations
11. Understand contemporary issues affecting groundwater including climate change

Course Resources

Course Website(s)

Required Course Texts and Materials

Textbook:

Freeze and J. Cherry, GROUNDWATER, Prentice Hall

Reference Textbooks:

1. C.W. Fetter, Applied Hydrogeology, 4th Edition. Prentice Hall.
2. C. W. Fetter, Contaminant Hydrogeology, 2nd Edition, Prentice hall.
3. D. Domenico and F. W. Schwartz, Physical and Chemical Hydrogeology. 2nd Edition, John Wiley and Sons, Inc.
4. M. P. Anderson and W. W. Woessner, Applied groundwater Modeling, Simulation of Flow and Advective Transport. Academic Press.
5. H. F. Wang and M. P. Anderson, Introduction to Groundwater Modeling, Finite Difference and Finite Element Methods. Academic Press.
6. P. B. Bedient, H. S. Rifai, and C. J. Newell. Groundwater Contamination, Transport and remediation, 2nd Edition, Prentice Hall PTR.

Course Learning Outcomes

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

Grading Policy

Evaluation of the student's final grade in the course will be based on his/her performance throughout the course and will be a combination of the following:

Item	*Percentage*
Homework and/or class assignments	***10***
Two Tests (25 % each)	***50***

Comprehensive Final Exam	***40***

Course Policies

Structure

Lecture	Two 75-minute lectures per week
Laboratory	None
Medium	all material explained in class and on the whiteboard
Tests	2 Tests-90 minutes each - closed book
Final	180 minutes, comprehensive, closed book
H.W.	Several H.W., solution posted after submission
Projects	Design of a system

Policy

Class Attendance	You are expected to attend all classes and arrive on time. Obtain prior clearance for planned absences and meet with the instructor after any emergency absences. It is the student's responsibility to obtain any class notes and/or homework questions in case of being absent from a lecture.
Academic Integrity	❖ LAU expects all students to maintain the highest level of integrity. Cheating or plagiarism will not be tolerated. University policies regarding academic integrity are available in

	http://www.lau.edu/policies ❖ The instructor will adhere to all LAU policies regarding academic integrity as stated. ❖ All work must be the result of students' own efforts. ❖ Students who are suspected of plagiarism or other violations of academic integrity codes will face investigation. Those found guilty will face disciplinary action. Repeated offenses will result in permanent expulsion from the University.
Homework Policy	Homework must be neat and legible or it will not be graded, and must be turned in at the beginning of class on the day it is due, with no exceptions.
Exam Policy	Make a consorted effort to be present for each test since there will not be any makeup. A student who misses a test will be given a zero grade unless the student can provide a convincing excuse. With a convincing excuse, either a make-up exam will be given or the other exams will be weighted heavier, at the instructor's discretion.
Exam Dates	**❖ Test 1 is scheduled on xxx.** **❖ Test 2 is scheduled xxx.** **❖ Final Exam is scheduled by the Registrar.**
Course Website	Syllabus, solution of homework, solution of tests, solution of previous tests, handouts, and any relevant material are placed on "courses online" at services.sea.lau.edu.lb
Cheating	A students caught cheating on an exam receives a grade of zero on the exam in the first cheating attempt and a warning. A student caught cheating for the second time in the same course receives an F grade in the course and a second warning.
Studying	❖ You need to study on a regular basis after each lecture. Do not postpone studying till just before the tests.

	❖ Solve the assigned homework as soon as it is announced in class. To benefit the most from the previous tests, solve it on your own as if it were a real test and then look at the solution. ❖ You are responsible for all the material covered in class. Any material that is in the textbook and not covered in class will not be included in the tests. ❖ Take advantage of my office hours. It is your chance to get individual attention and explanation. ❖ Finally, a well prepared student does not need to study on the night before the exam.

Course Schedule

Topic		
1	***Introduction to groundwater***	Hydrologic cycle; classification of subsurface water, types of aquifers, aquifer parameters' groundwater movement, physical properties and principles, hydraulic conductivity: homogeneous – heterogeneous, isotropic – anisotropic systems, compressibility, effective stress
2	***Flownets***	Flow nets and their use in groundwater
3	***Mathematics of groundwater***	Groundwater flow equations in the saturated and unsaturated zones

4	***Well hydraulics and groundwater recharge***	Steady state and unsteady states well hydraulics, piezometers, slug tests, groundwater recharge
5	***Contaminant mass transport***	Principles of mass transport in porous media, advection, diffusion, dispersion, soil-chemical- groundwater interactions, adsorption, biodegradation
6	***Groundwater modelling principles***	Use of numerical methods in groundwater modelling
7	***Contemporary issues and case studies***	Case studies on contemporary issues pertaining to groundwater hydrology and pollution including the effects of climate change

Groundwater Hydrology and Pollution (CIE600) Course Module

Course	**Groundwater Hydrology and Pollution**
Module 1	Introduction to groundwater
Key Concepts	Groundwater occurrence, aquifers, Darcy's law
Overview	This module goes over the hydrologic cycle, classification of subsurface water, types of aquifers, aquifer parameters', groundwater movement, physical properties and principles, hydraulic conductivity, homogeneous/heterogeneous, isotropic/anisotropic systems, and aquifer compressibility
Aim	The aim of this module is introduce the concepts of groundwater occurrence and its movement in the subsurface.
Learning Outcomes	At the end of this module students will be able to: • Acquire knowledge about groundwater occurrence and Darcy's law • Acquire knowledge about aquifers characterization
Units	Unit 1.1 Groundwater occurrence Unit 1.2: Aquifers characterization Unit 1.3: Groundwater movement
Readings	Chapter 1: Introduction (Freeze and J. Cherry, GROUNDWATER, Prentice Hall).
Activity	**Overview** Solve homework problems on aquifer characterization and groundwater movement
Module 2	Flow nets
Key Concepts	Flow nets, seepage

Overview	In this module students will learn about the different types of flow nets and their use in calculation of seepage of groundwater.
Aim	The aim of this module is to equip the student with the tools needed to predicted seepage using flow nets
Learning Outcomes	At the end of this module learners will be able to: • Construct of flow nets • Calculate seepage using flow nets
Units	Unit 2.1: Construction of flow nets Unit 2.2: Calculation of seepage using flow nets
Readings	Chapter 5: Flow Nets (Freeze and J. Cherry, GROUNDWATER, Prentice Hall)
Activity	**Overview**
	Solve homework problems pertaining to construction of flow nets and calculation of seepage using flow nets
Module 3	Mathematics of groundwater
Key Concepts	Equations of groundwater flow
Overview	In this module students will learn to derive the equations of groundwater flow from first principles and the analytical methods to solve them.
Aim	The aim of this module is to provide students with the tools to solve for groundwater flow in complicated systems
Learning Outcomes	At the end of this module learners will be able to: • Derive the groundwater equations • Solve for groundwater flow in complicated systems
Units	Unit 3.1: Derivation of groundwater flow equations Unit 3.2: Solution of groundwater equations

Readings	Chapter 2: Physical properties and principles (Freeze and J. Cherry, GROUNDWATER, Prentice Hall). A compilation of handouts.
Activity	**Overview**
	Homework problems on use of groundwater equations.
Module 4	Well hydraulics and groundwater recharge
Key Concepts	Well hydraulics, groundwater recharge
Overview	In this module students will learn about well hydraulics, pumping tests, pumping data analysis, slug tests, aquifer parameters extraction from pumping data, groundwater recharge
Aim	The aim of this module is to provide students with the knowledge to design for pumping and recharging wells.
Learning Outcomes	At the end of this module students will be able to: • Design pumping and recharge wells • Extract aquifer data from pumping tests
Units	Unit 3.1: Well hydraulics Unit 3.2: Groundwater recharge
Readings	Chapter 8: Groundwater Resource evaluation (Freeze and J. Cherry, GROUNDWATER, Prentice Hall). A compilation of handouts.
Activity	**Overview**

	Solve problems pertaining to well hydraulics and groundwater recharge.
Module 5	Contaminant mass transport
Key Concepts	Contaminant transport, advection, dispersion, biodegradation
Overview	In this module students will learn about contaminant mass transport in porous media including advection, dispersion, and biodegradation. Analysis will be conducted for both the saturated and the unsaturated zones.
Aim	The aim of this module is to equip students with the tools necessary to design solve for contaminant transport in porous media.
Learning Outcomes	At the end of this module learners will be able to do the following: • Solve for contaminant transport in porous media
Units	Unit 5.1: Mass transport in saturated media Unit 5.2: Mass transport in the vadose zone Unit 5.3: Transformation, retardation, and attenuation of contaminants
Readings	Chapter 2: Mass transport in saturated media. Chapter 3: Transformation, Retardation, and attenuation of solutes. Chapter 4: Flow and mass transport in the vadose zone. (C. W. Fetter, Contaminant Hydrogeology, 2nd Edition, Prentice hall).
Activity	**Overview**

	Solve problems on contaminant mass transport in porous media
Module 6	Groundwater modeling principles
Key Concepts	Groundwater flow models, finite difference
Overview	In this module students will learn about groundwater flow modeling incorporating finite difference methods
Aim	The aim of this module is to introduce students to groundwater flow modeling
Learning Outcomes	At the end of this module students will: • Discretise groundwater flow equations • Use finite difference method to model groundwater flow.
Units	Unit 6.1: Discretization of groundwater equations Unit 6.2: Modeling groundwater flow using finite difference methods
Readings	Chapter 1: Introduction. Chapter 2: Finite differences- Steady state flow (Laplace's equation). Chapter 3: Finite differences- Steady state flow (Poisson's equation). Chapter 4. Finite differences- Transient flow. (H. F. Wang and M. P. Anderson, Introduction to Groundwater Modeling, Finite Difference and Finite Element Methods. Academic Press)
Activity	**Overview**
	Solve groundwater flow problems using finite difference schemes
Module 7	**Contemporary issues and case studies**
Key Concepts	Climate change
Overview	This module is a collection of seminar type presentations which will go over the effects of climate change on groundwater hydrology and pollution.
Aim	The aim of this module is to help students understand the impact of climate change on groundwater.

Learning Outcomes	At the end of this module learners will be able to: • anticipate effects of climate change in groundwater design projects
Units	Unit 6.1: Effects of climate change of groundwater hydrology Unit 6.2: Effects of climate change on groundwater pollution
Readings	A compilation of hands-out
Activity	**Overview**
	Individual or group student presentations on effects of climate change on groundwater hydrology and pollution

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

CIE 730

Irrigation and Drainage Engineering

Department of Civil Engineering, School of Engineering & Architecture

Lebanese American University

Fall Semester ……

Instructor Information

Instructor: Dr. Ghassan Mikati
Office Location:
Telephone: Office
Office Hours:
E-mail:
Website:

Course Identification

Course Number: CIE 730
Course Name: Irrigation and Drainage Engineering
Course Location: Byblos Campus
Class Times: T-Th 2:00-3:15
Prerequisites: Senior or Graduate Standing in Civil Engineering
Faculty Web Page:

Course Description/Overview

CIE730/CIE600 Irrigation and Drainage [3-0, 3 cr.] The principles of irrigation and drainage engineering including introduction to irrigation methods, irrigation systems evaluation, soil physical properties, evapotranspiration calculations, water flow measurements, irrigation conveyance and application, pumping, drainage, and soil-water relationships; irrigation and drainage systems design; drainage system design

Course Learning Objectives

Course Content Learning Outcomes

On the successful completion of this course, you will be able to:

1. Learn Importance of Irrigation and how to select the appropriate irrigation method
2. Calculate soil water balances & determine soil physical characteristics
3. Perform closed conduits and open channel flow hydraulic calculations
4. Determine actual and reference evapotranspiration rates and ccalculate crop water requirements
5. Evaluate Soil infiltration rates and Surface Irrigation Systems
6. Design a Sprinkle & Trickle Irrigation System
7. Calculate Spacing across drains for drainage System design

Course Resources

Course Website(s)

Required Course Texts and Materials

- Material will be distributed in class. Readings will be assigned whenever necessary

Additional References

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

Grading Policy

Exam 1:	20%
Exam 2:	20%
Final:	40%
Assignments & Project	10%
Attendance and Participation:	10%

Course Policies

Structure

	Description
Lecture	Two 75-minute lectures per week

Laboratory	None
Medium	all material explained in class and on the whiteboard
Tests	Two 75 minute exams
Final	120 minutes, comprehensive
H.W.	Assignments
Projects	(1) Design project

Policy

Attendance is obligatory.
Homework is to be submitted according to pre-arranged schedule

Additional Notes

- A student can miss no more than 4 sessions of instruction. By the 5th session, the instructor may ask the student to drop the course.
- Plagiarism: students caught cheating on an exam receive a grade of Zero on the exam in the first cheating attempt and a warning. Students caught cheating for the second time in the same course receive an F grade in the course and a second warning. A grade of zero on an exam resulting from cheating must be counted in the student's course grade. The zero cannot be dropped in computing the final grade in case the instructor has a policy of allowing students to drop their worst exam grade.
- Any student who receives 3 warnings will be suspended

Course Schedule

Week 1	❖ Introduction to Irrigation Methods and Systems
Week 2	❖ Hydrologic Balances
Week 3	❖ Soil and water Relationship
Week 4	❖ Basic Soil Water Physics
Week 5	❖ Measuring Soil Water Content
Week 6	❖ Water Infiltration in Soils
Week 7	❖ Crop Production Factors
Week 8	❖ Evapotranspiration Fundamentals
Week 9	❖ Evapotranspiration Equations
Week 10	❖ Pipeline & Open-Channel Hydraulics
Week 11	❖ Hydraulic Protection of Pipelines
Week 12	❖ Water Use Efficiency
Week 13	❖ Surface Irrigation Operation & Evaluation.

Week 14	❖ Sprinkle & Trickle Irrigation Operation & Evaluation
Week 15	❖ Drainage of Agricultural Lands

Course	*Irrigation and Drainage*
Module 1	Soil Physics
Key Concepts	Soil water content, potential and infiltration
Overview	Understanding soil physics: This module introduces the student to the varying water content in soils as a result of the dynamic water movement in and out of soils. Also, emphasis is stressed on soil water potentials and the resulting influx and out flux of water. Finally, the physics of water infiltration in soils is discussed
Aim	The aim of this module is to make students understand the physical properties of soils
Learning Outcomes	At the end of this module learners will be able to: • Calculate soil water content • Calculate soil water potential

	• Determine the temporal changes in infiltration
Units	Unit 1.1 Soil Overview Unit 1.2: Soil water contents Unit 1.3: Soil water potentials Unit 1.4: Water infiltration Unit 1.5: soil Chemistry
Readings	Material Provided in class
Activity	**Overview** Assignment 1.1: Solving soil water content problems Assignment 1.2: Solving soil water potential problems Assignment 1.3: Solving soil water infiltration problems
Module 2	Evapotranspiration (ET)
Key Concepts	Evaporation, Transpiration and Evapotranspiration Concepts
Overview	This module introduces the concept of ET, and the different equations used to predict ET in different regions and climatic conditions
Aim	To be familiar with ET equations and calculation
Learning Outcomes	• At the end of this module learners will be able to: • Understand the different ET equations • Be able to choose the right ET equation based on conditions • Calculate ET
Units	Unit 2.1: Get familiar with ET concepts Unit 2.2: Discuss the Penmann Monteith ET equation Unit 2.3: Discuss the FAO Heargreaves ET equation Unit 2.4: Calculate ET of different crops
Readings	Material Provided in class
Activity	**Overview**

	Assignment 2.1: Solar radiation calculation Assignment 2.2: Reference ET calculations Assignment 2.3: Crop ET calculation
Module 3	Irrigation System Design
Key Concepts	Hydraulics of closed systems
Overview	This module introduces closed/pressurized irrigation systems explaining the hydraulics of it. It will explain how to select and design a closed irrigation system
Aim	This module aims at designing a sprinkle or trickle irrigation system
Learning Outcomes	At the end of this module learners will be able to: • Select the right system • Design the operation of the selected system
Units	Unit 3.1: Sprinkle system design *Unit 3.2: Trickle System design*
Readings	Material Provided in class
Activity	**Overview**
	Assignment 3.1: Irrigation System Design Project
Module 4	Introduction to Surface Irrigation and Drainage
Key Concepts	Introducing: - Surface irrigation systems - Drainage systems
Overview	Define the principles of selection of surface irrigation systems and drainage systems
Aim	To introduce the different types of surface irrigation systems and overview of drainage systems
Learning	At the end of this module learners will be able to:

Outcomes	• Preliminary design a surface irrigation system • Preliminary design a drainage system
Units	Unit 3.1: Surface irrigation systems Unit 3.2: Drainage systems
Readings	Material Provided in class
Activity	**Overview**
	Assignment 4.1: Research and Presentations on different surface irrigation and drainage systems

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

CIE 788

Fundamentals of GIS and Remote Sensing

Department of Civil Engineering, School of Engineering & Architecture

Lebanese American University

Fall Semester ……

Instructor Information

Instructor: Dr. Ghassan Mikati
Office Location:
Telephone: Office
Office Hours:
E-mail:
Website:

Course Identification

Course Number: CIE 788
Course Name: Fundamentals of GIS and Remote Sensing
Course Location: Byblos Campus
Class Times: T-Th 8:00-9:50
Prerequisites: CIE361 Surveying
Faculty Web Page:

Course Description/Overview

CIE788 GIS and Remote Sensing [3-0, 3 cr.] This course covers the fundamentals of sensing earth resources, data acquisition and sis, aircraft and satellite images, digital image processing, pattern recognition, feature extraction, and the geographic information systems in various applications, using GIS software including ARC-INFO and ARC-VIEW.

Course Learning Objectives

Course Content Learning Outcomes

The major objectives of this course are to introduce students to the technology of GIS, GPS and remote sensing. By the end of the course, the student will understand the multiple benefits and usage of such technology, will know how to create and manipulate spatial data, will know how to work with different coordinate systems, will know how to use and operate GPS equipment and will know how to read and extract information from satellite images.

Course Resources

Course Website(s)

Required Course Texts and Materials

7. Material to be handed in class as notes
8. Software: ArcGIS ArcView software; Image processing software, internet access
9. Equipment: GPS units

Additional References

www.esri.com

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

Grading Policy

Exam 1:	20%
Exam 2:	20%
Final:	40%
Assignments & Project	10%
Attendance and Participation:	10%

Course Policies

Structure

Policy

Attendance is obligatory.
Homework is to be submitted according to pre-arranged schedule

Additional Notes

- A student can miss no more than 4 sessions of instruction. By the 5th session, the instructor may ask the student to drop the course.
- Plagiarism: students caught cheating on an exam receive a grade of Zero on the exam in the first cheating attempt and a warning. Students caught cheating for the second time in the same course receive an F grade in the course and a second warning. A grade of zero on an exam resulting from cheating must be counted in the student's course grade. The zero cannot be dropped in computing the final grade in case the instructor has a policy of allowing students to drop their worst exam grade.
- Any student who receives 3 warnings will be suspended

Course Schedule

Topic	
Week 1	Introduction and Geographic Information Systems
Week 2	Fundamentals of GIS
Week 3	Data Manipulation, and display
Week 4	Queries; Tabular and Spatial
Week 5	Queries; Tabular and Spatial (continued)
Week 6	Geoprocessing and Buffers

Week 7	Geoprocessing and Buffers (continued)
Week 8	Map Layout
Week 9	Digitizing Process
Week 10	Digitizing Process (continued)
Week 11	GPS: Fundamentals of Projections
Week 12	GPS: Introduction to GPS
Week 13	Fundamentals of Remote Sensing
Week 14	Introduction to Remote Sensing data manipulation
Week 15	Applications in Remote Sensing

Course	***Fundamentals of GIS and Remote Sensing***
Module 1	Fundamentals of GIS

Key Concepts	GIS definition, concepts and technology
Overview	Understanding GIS: Many times GIS understanding is limited to the concept of car navigation software. This module will detail the concepts of GIS and enumerate many applications in which GIS is becoming a key analytical factor in different disciplines including engineering, environmental sciences, business and climatology.
Aim	The aim of this module is to make students understand the benefits of GIS and its applications in their professional life
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss the different types of GIS applications • Discuss how GIS technology can contribute to better problem analysis
Units	Unit 1.1 Introduce GIS concept Unit 1.2: Overview of GIS applications is different disciplines Unit 1.3: Introduce GIS components (software and data)
Readings	Principles of Geographic Information Systems; An Introductory Textbook Otto Huisman and Rolf A.De By Ch.1
Activity	**Overview** Assignment 1.1: Research on GIS applications in different fields 1. In Engineering 2. In Environmental Sciences 3. In Climatology 4. In Business Assignment 1.2: Hands on online GIS applications 1. Get Familiar with Google Earth, bing maps. Experience map navigation, and search 2. Overview of ArcGIS online system
Module 2	Introducing ArcGIS

Key Concepts	Navigation, Query, Layouts, and Editing data in ArcGIS
Overview	This module introduces ArcGIS software functionalities and how we can handle and manipulate data. Tasks involved in this module include geographic data loading, navigation, query, database analysis, data filters, data layouts and data editing
Aim	To be familiar with ArcGIS software and how to manipulate data in such environment.
Learning Outcomes	• At the end of this module learners will be able to: • Open, search and analyse Geo data sets • Create map layouts • Create new geo data sets
Units	Unit 2.1: Get familiar with loading and navigating through Geographic data Unit 2.2: Query and filter geographic data based on attributes and geography Unit 2.3: Create map templates and maps from geographic data Unit 2.4: Create new geographic data sets
Readings	Principles of Geographic Information Systems; An Introductory Textbook Otto Huisman and Rolf A.De By Ch.2 Help of ArcGIS software
Activity	**Overview**
	Assignment 2.1: Upload geo-data sets to Arc GIS Assignment 2.2: Query information in the attribute tables of the Geo data sets Assignment 2.3: Query information geographically in the Geo data sets Assignment 2.4: Classify and display data based on pre-set criteria Assignment 2.5: Create maps of classified data with legends

	Assignment 2.6: Create new geo-data sets from survey data or scanned maps
Module 3	Introducing Global Positionning Systems
Key Concepts	Understand and Operate GPS units
Overview	This module introduces GPS and explains in details how GPS data acquisition occurs. Such understanding will help users know the capabilities and limitations of GPS for better usage
Aim	This module aims at creating better GPS users and surveyors
Learning Outcomes	At the end of this module learners will be able to: • Understand how GPS functions • How to by-pass limitations to improve accuracy
Units	Unit 3.1: Theory and concepts of GPS *Unit 3.2: Errors in GPS* Unit 3.3: *Correcting Errors in GPS*
Readings	GPS Guide for beginners Garmin
Activity	**Overview**
	Assignment 3.1: Learn how to get readings using GPS units Assignment 3.2: Learn how to collect data using GPS units
Module 4	Introduction to Remote Sensing Principles
Key Concepts	Learn how aerial and satellite images can be an important tool of data collection and surveying
Overview	Define the concepts behind Electromagnetic Radiation (EMR) and how remote sensing instruments capture information using it
Aim	To introduce the newest trend in data capture in a timely manner all across the globe
Learning Outcomes	At the end of this module learners will be able to: • Understand better the EMR principles • Know theoretically how to extract information from EMR imagery

Units	Unit 3.1: Definition of Remote Sensing Unit 3.2: Principles of EMR Unit 3.3: Remote Sensing instrument specifications
Readings	Extracts from Remote Sensing Books and articles
Activity	**Overview**
	Assignment 4.1: Get first-hand experience of reading information from satellite images

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number:ECO311

Development Economics Lebanese American University, Faculty of Economics, Department of Economics

Fall Semester, 2014

Instructor Information

Instructor: Dr. Amjad Toukan

Office Location: Business Building 1516
Telephone: Office +961 1 786456
Office Hours: T-R: 9AM – 12PM
E-mail: amjad.toukan@lau.edu.lb
Website: WWW.LAU.EDU.LB

Course Identification

Course Number: ECO 311
Course Name: Development Economics
Course Location: University Campus
Class Times: N/A
Prerequisites: N/A

Faculty Web Page: WWW.LAU.EDU.LB

Course Description/Overview

The eradication of poverty is the main objective of economic development. After reviewing the concepts of poverty and development from the standpoint of economic growth and institutions, the course will focus on the limitations of this approach, and will highlight what is needed in order to get a better picture of economic development theories for the eradication of poverty.

Course Learning Objectives

Course Content Learning Outcomes

Course Resources

Course Website(s)

Required Course Texts and Materials

Required: Development Economics (1998), by Debraj Ray, Princeton University Press. (DR). A lot of the material covered in the course will be from articles.

Optional Course Texts and Materials

Michael Todaro & Stephen Smith; Economic Development (eleventh edition, 2011).

Assignments and Grading Scheme

Grading System

Grading Scale: *The official grading scale for LAU is as follows:-*

≥ 90	A
87-89	A-
83-86	B+
80-82	B

77-79	B-
73-76	C+
70-72	C
67-69	C-
63-66	D+
60-62	D
< 59	F

Grading Policy

The course grade is calculated according to the following:

Exams I, II (25% on each) **Exam I will take place on October 28th, Exam II on December 2nd.**	50%
Final Exam (The final exam is comprehensive)	30%
Term Paper (Due at the end of the semester and details will be discussed in class)	10%
Attendance & Participation	10%
Total Points	**100**

Course Policies.

Attendance Policy: Attendance is required and checked regularly. Class participation is encouraged and rewarded. Students who miss more than the equivalent of 2 weeks of instructions (6 MWF or 4 TTh sessions or 3 Summer sessions), will lose the 5% attendance and participation grade.

According to LAU regulations, in any semester, students who miss an equivalent of 5 weeks of instructions (15 MWF or 10 TTh sessions or 8 Summer sessions) in any course for whatever reason, **will be advised to withdraw or will receive an F**.

Cheating Policy: Ethical behavior and professional manners are expected in class and during exams, in accordance with the university Student Code of Conduct. Any alleged violation of the Student Code of Conduct will be reported to the Director of Guidance or to the Dean of Students. Cell phones have to be switched off and not visible at all time during classes and exams. The minimum penalty for cases of cheating will be failing the course.

Makeup work: Requests for approval of a make-up exam should be made **in advance** of the specified date of the exam. The requests will be approved for medical situations only if the appropriate medical excuse presented to the guidance office is deemed valid **by the instructor**.

Regular attendance and participation is crucial to your success. Reading the assigned chapters/papers before class will greatly assist your understanding of the lecture. After the lecture, you are advised to study your notes and write down your questions to be clarified during my office hours.

Important Dates to Remember

Topics covered and course schedule

Deadline for withdrawal from the course with a "W" grade Oct. 22, 2014

Last day of classes: Dec. 23, 2014

Deadline for withdrawal from the course with a "WP" or "WF" grade: Nov. 25, 2014

APENDIX II: The CLIMASP Course Modules Template Example

Course	Curriculum and Hypermedia
Module 1	**The Big Picture**
Key Concepts	What is development economics?
Overview	Income and growth Historical experience Measurement issues Income distribution in developing countries The many faces of underdevelopment Human development An index of human development Per capita income and human development Some structural features Demographic characteristics Occupational and production structure Rapid rural--urban migration International trade
Aim	
Learning Outcomes	
Units	N/A
Readings	*DR, Chapters 1 and 2: Introduction, and Economic Development: An Overview.

	*The World Bank, *World Development Report*. Sen, Amartya (1988), "The Concept of Development", in H. Chenery and T. N. Srinivasan (eds.), *Handbook of Development Economics*. Sen, Amartya (1993), "Development: Which Way Now?" *The Economic Journal*, 93, (December).
Activity	
Module 2	**Growth**
Key Concepts	Modern economic growth: Basic features
Overview	Theories of economic growth The Harrod--Domar model Beyond Harrod--Domar: Other considerations The Solow model Technical progress Convergence? Unconditional convergence Level convergence: Evidence or lack thereof Unconditional convergence: A summation Conditional convergence The New Growth Theories

	Human capital and growth Another look at conditional convergence
Aim	
Learning Outcomes	
Units	N/A
Readings	
Activity	**Overview**
	DR, Chapter 3: Economic Growth *DR, Chapter 4: The New Growth Theories *Delong, J Bradford, 2003, "India Since Independence: An Analytic Growth Narrative", in Dani Rodrick eds, *In search of prosperity: analytic narratives on* *economic growth*, Princeton University Press. *Rodrik, Dani, and Arvind Subramanian, 2005, "From "Hindu Growth" To Productivity Surge: The Mystery of the Indian Growth Transition", *IMF Staff Papers*, 52(2), 193-228. *Kotwal. Ashok, Bharat Ramaswami and Wilima Wadhwa, 2009, "Economic Liberalization and Indian Economic Growth: What's the Evidence?", mimeo. Kochar, Kalpana, Utsav Kumar, Raghuram Rajan, Arvind Subramanian and Ioannis

	Tokatlidis, 2006, "India's Pattern of Devolopment: What Happened, What follows?, *Journal of Monetary Economics,* 53 (5), 981–1019. Joshi, Vijay and I.M.D. Little, 1994, *India: Macroeconomics and Poilitical Economy* *1964-1991*, The World Bank: Washington.
Module 3	**Poverty & Inequality**
Key Concepts	What is economic inequality?
Overview	The context Economic inequality: Preliminary observations Measuring economic inequality Introduction Four criteria for inequality measurement The Lorenz curve Complete measures of inequality Poverty: First principles Conceptual issues Poverty measures Poverty: Empirical observations Demographic features Rural and urban poverty Assets Nutrition The functional impact of poverty Poverty, credit, and insurance Poverty, nutrition, and labor markets

	Poverty and the household
Aim	
Learning Outcomes	
Units	N/A
Readings	
Activity	**Overview**
	*DR, Chapter 8: Poverty and Under nutrition *DR, Chapter 6: Economic Inequality Radhakrishna, R., and Shovan Ray, (2005), eds *Oxford Handbook of Poverty in India,* *Perspectives, Policies, and Programmes*, Oxford University Press: New Delhi. Deaton, Angus, and Jean Drèze, "Poverty and Inequality in India: A Reexamination", Working Paper No. 107, Centre for Development Economics, Delhi School of Economics.
Module 4	**Poverty and Growth**
Key Concepts	Inequality, income, and growth
Overview	The Inverted-U hypothesis Testing the inverted-U hypothesis Income and inequality: Uneven and compensatory changes Inequality, savings, income, and growth

	Inequality, political redistribution, and growth Inequality and growth: Evidence Inequality and demand composition Inequality, capital markets, and development Inequality and development: Human capital
Aim	
Learning Outcomes	
Units	N/A
Readings	DR, Chapter 7: Inequality and Development: Interconnections * Eswaran, M. and A. Kotwal (1993), "A Theory of Real Wage Growth in LDCs", *Journal of Development Economics*, 42, pp. 243-270. Eswaran, Mukesh and Ashok Kotwal, 1994, *Why Poverty Persists in India*, Oxford University Press: Delhi. * Eswaran, Mukesh, Ashok Kotwal, Bharat Ramaswami and Wilima Wadhwa, 2007, "How Does Poverty Decline? Evidence from India, 1983-1999, mimeo. *Aghion, Philippe, and Beatriz Armendáriz de Aghion (2006), "A New Growth Approach to Poverty Reduction", in *Understanding Poverty*, edited by A.B. Banerjee, R. Benabou, and D. Mookherjee. Oxford University Press.

Datt, Gaurav, and Martin Ravallion, 1998, "Farm Productivity and Rural Poverty in India", Food Consumption and Nutrition Division Paper No. 42, International Food Policy Research Institute.

Dollar, David and Aart Kraay, 2002, "Growth is Good for the Poor", Journal of Economic Growth, 7(3), 195-225.

Ravallion, M. (2001), "Growth, Inequality, and Poverty: Looking Beyond Averages", *World Development*, 29 (11): 1803-1815.

*Besley, Timothy and Robin Burgess (2003), "Halving Global Poverty", *Journal of Economic Perspectives*, 17(3), pp. 3-22.

Lopez (2004), "Pro-Poor Growth: A Review of What We Know (and of What We Don't)", mimeo, World Bank.

Foster, A. and M. Rosenzweig (2003), "Agricultural Development, Industrialization, and Rural Inequality", mimeo.

Foster, A. and M. Rosenzweig (2004), "Agricultural Productivity Growth, Rural Economic Diversity and Economic Reforms: India 1970-2000", *Economic*

	Development and Cultural Change, pp. 509-542.
Activity	**Overview**
Module 5	**Institutions and Growth**
Key Concepts	Institutions, geography, and the global distribution of income Barriers to growth: corruption
Overview	
Aim	
Learning Outcomes	
Units	
Readings	*Glaeser, Edward, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer, 2004, "Do Institutions Cause Growth", *Journal of Economic Growth*, 9(3), 271-303. *Acemoglu, Daron, Simon Johnson, and James Robinson (2005), "Institutions as the Fundamental Cause of Long-Run Growth", Ch 6, pp 385 – 472, in Philippe Aghion & Steven Durlauf, eds, *Handbook of Economic Growth*, Elsevier. * Subramanian, Arvind, 2006, "The Intriguing Relationship Between Growth and

	Institutions in India", mimeo, forthcoming Oxford Review of Economic Policy, Summer 2007.. Acemoglu, D., S. Johnson, and J. Robinson (2002) "Reversal of fortune: geography and institutions in the making of the modern world income distribution", *Quarterly* *Journal of Economics*, 117, 1231-1294. Acemoglu, D., J. Robinson , and S. Johnson (2001)"The colonial origins of comparative development: an empirical investigation", *American Economic Review*, 91, 1369-1401. Ferraz and Finan (2008) "Exposing Corrupt Politicians: The Effect of Brazils Publicly Released Audits on Electoral Outcomes" Quarterly Journal of Economics Shleifer, Andrei & Vishny, Robert W, 1993. "Corruption," The Quarterly Journal of Economics, MIT Press, MIT Press, vol. 108(3), pages 599-617, August. Mauro Paolo (1995) Corruption and Growth. The Quarterly Journal of Economics. 110(3): 681-712.
Activity	**Overview**

Module 6	**Credit Constraints**
Key Concepts	The limits to credit and insurance Sources of demand for credit and insurance Rural credit markets
Overview	Who provides rural credit? Some characteristics of rural credit markets Theories of informal credit markets Lender's monopoly The lender's risk hypothesis Default and fixed-capital loans Default and collateral Default and credit rationing Informational asymmetries and credit rationing Default and enforcement Interlinked transactions Hidden interest Interlinkages and information Interlinkages and enforcement Interlinkages and creation of efficient surplus Alternative credit policies Vertical formal--informal links Microfinance
Aim	
Learning Outcomes	
Units	N/A

Readings	*DR, Chapter 14: Credit *Armendáriz de Aghion, Beatriz, Ashok Rai, and Thomas Söjström (2006), "Poverty Reducing Credit Policies", in *Understanding Poverty*, edited by A.B. Banerjee, R. Benabou, and D. Mookherjee. Oxford University Press. Burgess, Robin and Rohini Pande (2005) "Do rural banks matter? Evidence from the Indian Social Banking Experiment", American Economic Review, 95. Armendáriz de Aghion, Beatriz, and Jonathan Morduch (2005), *The Economics of* *Microfinance*, MIT Press, Chapters 1, 4 and 5. Besley, Timothy (1995), "Savings, Credit and Insurance", pp. 2175 – 2201, in T.N. Srinivasan eds, *Handbook of Development Economics*, Vol. III..
Activity	**Overview**
Module 7	**Trade and Poverty**
Key Concepts	Gains from trade?
Overview	Overall gains and distributive effects Overall losses from trade? Trade policy: Import substitution

	Basic concepts More detail Export promotion Basic concepts Effect on the exchange rate The instruments of export promotion: More detail The move away from import substitution
Aim	
Learning Outcomes	
Units	N/A
Readings	
Activity	**Overview**
	*DR, Chapter 17: Credit * Eswaran, M. and A. Kotwal (1993), "Export Led Development: Primary vs. Industrial Exports", *Journal of Development Economics*, 41, pp. 163-172. Topalova, P. (2005), "Trade Liberalization, Poverty and Inequality: Evidence from Indian Districts", Department of Economics, Massachusetts Institute of Technology, August.

Module 8	**The Environment and Development**
Key Concepts	Sustainable development and environmental accounting
Overview	Population, resources, and the environment Poverty and the environment Growth versus the environment Rural development and the environment Urban development and the environment The global environment
Aim	
Learning Outcomes	
Units	N/A
Readings	* Todaro & Smith, Chapter 10: The Environment and Development t
Activity	**Overview**

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

ECO 320

ECO 320 Environmental, Resource, and Energy Economics Department of Economics, School of Business

Lebanese American University
Fall Semester ……

Instructor Information

Instructor: Dr. Walid Marrouch
Office Location: Business Building 1517
Telephone: 1517
Office Hours: TBA
E-mail: walid.marrouch@lau.edu.lb
Website:

Course Identification

Course Number: ECO 320
Course Name: Environmental, Resource, and Energy Economics
Course Location: TBA
Class Times: TBA
Prerequisites: ECO 201 and ECO 202

Faculty Web Page:

Course Description/Overview

ECO 320 Environmental, Resource, and Energy Economics [3-0, 3 cr]

This course introduces students to the basics of environmental and natural resource economics and the fundamentals of environmental policymaking. The first part of the course will discuss environmental pollution and policy solutions, the second part will discuss natural resource exploitation, sustainability and keys issues in energy economics. The course also highlights scientific facts that shape environmental policy debates.

Course Learning Objectives

Course Content Learning Outcomes

At the conclusion of this course, each student will be able to do the following:

1. To apply rational and critical economic thinking to environmental and natural resource problems.
2. Apply economic tools to analyze environmental policy questions and mechanisms.
3. Describe the set of policy options and instruments to overcome market failures in environmental contexts and discuss their impact.
4. Understand the concept of sustainability and its applications in this economy and in policymaking.

Course Resources

Course Website(s)

Required Course Texts and Materials

Environmental Economics and Management: Theory, Policy and Applications, 6th Edition, 2013. By Thomas, J.M. and S.J. Callan. (Main text)

AND

Hand-outs from Natural Resource and Environmental Economics, 4th Edition, 2011. By Perman, Ma, Common, Maddison, and McGilvray. (Secondary text)

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

Grading Policy

Evaluation of the student's final grade in the course will be based on his/her performance throughout the course and will be a combination of the following:

Item	Percentage
Attendance and participation	5%
Exam 1	30%
Exam 2	30%
Comprehensive Final Exam	35%

Completion of the online course evaluations is required. Students will not be able to access their course grades until they have completed the course evaluations.

Course Policies

Structure

	Description
Lecture	Three 50-minute or two 75-minute lectures per week
Laboratory	None
Medium	All material explained in class and on the whiteboard
Tests	2 Exams-60 minutes - closed book
Final	120 minutes, comprehensive, closed book

Policy

Class Attendance	Attendance is required and checked regularly. Class participation is encouraged and rewarded. Students who miss more than the equivalent of 2 weeks of instructions (6 MWF or 4 TTh sessions or 3 Summer sessions), will lose the 5% attendance and participation grade. According to LAU regulations, in any semester, students who miss an equivalent of 5 weeks of instructions (15 MWF or 10 TTh sessions or 8 Summer sessions) in any course for whatever reason, will be advised to withdraw or will receive an F. Students are held responsible for all the material presented in the classroom, even during their absence.
Academic Integrity	The instructor will adhere to all LAU policies regarding academic integrity as statedhttp://www.lau.edu/policies.
Exam Policy	No make-up exam will be administrated; a student who misses an exam will have to provide a valid excuse within a week of the specified date of the exam. With a valid excuse, your final exam grade will be re-weighted
Cheating	Students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, forgery, or plagiarism. Plagiarism is defined as the use of someone else's ideas, words, or work, as if it were one's own, without clearly acknowledging the source of that information. Any student found cheating in an exam, fabricating, falsifying, or using any other form of academic dishonesty in the preparation of a paper or a project, shall receive a zero on that exam, project or paper and will be issued a Disciplinary Warning. A student found plagiarizing or cheating for a second time shall receive an F grade for the course, as well as a second Disciplinary Warning. Refer to the policy on academic dishonesty on LAU's website

	http://www.lau.edu.lb/academics/arp/g/rules_procedures.php .

Course Schedule*

Topic	
	Module 1: Modeling Environmental Problems Over the past decades, environmental pollution problems have taken on a more significant and visible role. Businesses, households and governments are changing their behaviour in order to respond to the growing environmental challenges. To understand these changes, it is necessary to figure out how markets work and the relationship between the economy and nature. This module introduces economic analysis models to explain the strategic decision making of all stakeholders and economic conditions that define the marketplace and how it relates to pollution problems.
1	The Role of Economics in Environmental Management (chap 1, main text)
2	The Market Process (chap 2, main text)
3	Market Failure (chap 3, main text)
4	The Command and Control Approach (chap 4, main text)
5	The Market Approach (chap 5, main text)
	Learning outcomes: 1. To apply rational and critical economic thinking to environmental problems. 2. Describe the set of policy options and instruments to overcome market failures in environmental contexts and discuss their impact.

	Assessment: Exam 1
	Module 2: Environmental Management and sustainability From a technical perspective, there has always been some form of airborne and solid waste pollution. Yet such problems did not begin to be pervasive problem until the Industrial Revolution. Moreover, concerns over sustainability and the potential trade-offs between growth and the environment are rather recent. This module provides a multistep approach to learning about global air quality problems, namely climate change. The module also discusses the main challenges in international environmental governance. In addition, the module looks into practical applications of the sustainability concept at the municipal and industrial levels.
6	Global Air Quality: The cases of Climate Change and Ozone Depletion (chap 13, main text)
7	Managing Municipal Solid Waste (Chap 18, main text)
8	International Environmental Agreements and International Trade (chap 20, main text)
9	Industrial Ecology and Pollution Prevention (chap 21, main text)
	Learning outcomes: 1. Apply economic tools to analyze environmental policy questions and mechanisms. 2. Understand the concept of sustainability and its applications in this economy and in policymaking. Assessment: Exam 2
	Module 3: Natural resource exploitation The optimal use of natural resources is an important aspect of sustainable growth and ultimately development in any economy. This module explores questions relating to the efficient and optimal use of environmental resources over time. The module

	will present a treatment of stock dynamics of both renewable and non-renewable resources and will explore various policy instruments aimed at conservation or preservation.
10	The efficient and optimal use of natural resources (chap 14, secondary text)
11	The theory of optimal resource extraction: non-renewable resources (chap 15, secondary text)
12	Renewable resources (chap 17, secondary text)
	Learning outcomes: 1. Apply economic tools to analyse natural resource problems. 2. Understand the applications of the optimum principle in renewable and non-renewable resource management and the linkages with sustainability. Assessment: Final Exam
	Module 4: Energy and sustainability The linkages between energy uses and sustainability provide an important window into the economy-ecology system. This module briefly explores the main challenges in energy policy faced by governments today. The module then draws conclusions on the relationship between energy use patterns and sustainability.
13	Energy poverty, energy subsidies, energy intensities, and electricity sources and uses (hand-outs)
	Learning outcomes: 1. Apply economic tools to analyse energy problems. 2. Identify the linkages between energy use patterns and sustainability. Assessment: Final Exam

*subject to minor modifications

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Challenges of Sustainable Development
Department of Economics, School of Business
Lebanese American University
Fall Semester ……

Instructor Information

Instructor: Dr. Saifedean Ammous
Office Location: FREM 509
Telephone: Office
Office Hours: After Class
E-mail: Saifedean.ammous@lau.edu.lb
Website:

Course Identification

Course Number: ECOXXX

Course Name: Challenges of Sustainable Development
Course Location: ####
Class Times: ####
Prerequisites: None
Faculty Web Page:

Course Description/Overview

This course provides an introduction to the interdisciplinary field of sustainable development, drawing on the most recent developments in social and physical sciences. The course describes the interactions between physical ecology and economic development, and it stresses the ways in which they impact each other. Ecological constraints (climate, disease ecology, physical resources such as soils and energy sources, topography and transport conditions) significantly shape the patterns of economic development, demography, and wealth and poverty. At the same time, anthropogenic activities (farming, resource depletion, demographic stresses, and energy use) change the physical environment. The course offers a rigorous treatment of the field and aims to provide students with an understanding of economic development and its relation to nature's processes.

Course Resources

Course Website(s)

Required Course Texts and Materials

Diamond, Jared. Guns, Germs, and Steel: The Fates of Human Societies. W.W. Norton, 1999.

McNeill, J.R. Something New Under the Sun. W.W.Norton, 2000.

Sachs, Jeffrey D. Common Wealth. Penguin, 2008.

Supplementary Reading

Angus Maddison, The World Economy
Introduction, Summary, and Chapters 1-3 (pp. 17-167)

Easterlin, "The Worldwide Standard of Living Since 1800," *The Journal of Economic Perspectives*, Vol. 14, No. 1, Winter 2000.

Pritchett, "Divergence Big Time," *The Journal of Economic Perspectives*, Vol. 11, No. 3, Summer 1997.

Easterlin, Richard, "Why Isn't the Whole World Developed?" *The Journal of Economic History*, Vol. 41, No. 1, March 1981.

Grading Policy

Evaluation of the student's final grade in the course will be based on his/her performance throughout the course and will be a combination of the following:

Item	Percentage
Term Paper (final report 15%, oral presentation 5%)	20%
Test 1	20%
Test 2	20%
Comprehensive Final Exam	40%

Completion of the online course evaluations is required. Students will not be able to access their course grades until they have completed the course evaluations.

Course Policies

Structure

	Description
Lecture	Two 75-minute lectures per week
Laboratory	None
Medium	All material explained in class and on the whiteboard
Tests	2 Tests-75 minutes - closed book
Final	120 minutes, comprehensive, closed book
Term Paper	Final report to be submitted, followed by a Class oral presentation.

Policy

Class	You are expected to attend all classes and arrive on time. Obtain prior

Attendance	clearance for planned absences.
Academic Integrity	The instructor will adhere to all LAU policies regarding academic integrity as statedhttp://www.lau.edu/policies.
Assignment Policy	Assignments must be typed and must be turned in at the beginning of class on the day it is due, with no exceptions.
Exam Policy	No make-up for a test or a final will be given under any circumstance. In case of absence, the grade of the exam will be considered to be zero.
Cheating	Students caught cheating on an exam receive a grade of zero on the exam.

Course Schedule

Week	Topic
1, 2	**Sustainable Development:** We will look at what "sustainable" and "development" mean in the context of sustainable development. We will also look at the historic trends of the two factors which together explain humankind's pressure on Earth's ecosystem: human economic activity, and the human population.
3, 4	**Economic Growth:** We will study the AK model of economic growth, and its implications for convergence across countries. We also look at structural changes along the development path: the relative importance of agriculture, and how urbanization patterns change. In addition, we will look at relaxing some assumptions of economic growth models and look at the possibility of poverty traps.
5	**Public versus Private Goods** When do markets work, and when don't they work? What are externalities and

	how do they relate to price signals?
6	**Sustainability of Resources** Renewable resources (fisheries, forests, etc.) can be driven to depletion if not managed properly. What are the problems with open access? Is privatization the answer, or perhaps community management? Can corrective taxation be useful? What about nonrenewable resources? We will look at an important non-renewable resource: fossil fuels.
7, 8	**Climate Change** Readings to be discussed: Wally Broecker, "A Business Executive's Guide to Global Warming." James Hansen. "Can we defuse the global warming time bomb?" *Scientific American*, March 2004. Stern Review: The Economics of Climate Change (Executive Summary) Lackner, Klaus and Jeffrey D. Sachs, "A Robust Strategy for Sustainable Energy," *Brookings Papers on* *Economic Activity*, Issue 2, 2005.
9	**The Role of Scientific Research in Sustainable Development** Nelson, Richard R. "Basic Scientific Research" in The Limits of Market Organization. Richard Nelson, ed. Russell Sage Foundation: New York, 2005.
10, 11	**The Challenge of Health for All** Readings to be discussed: WHO Commission on Macroeconomics and Health, Macroeconomics and Health: Investing in Health for Economic Development, 2001. Barry Bloom, "Public Health in Transition," *Scientific American*, Vol. 293, No. 3, September 2005. Laurie Garrett, "The Next Pandemic?" *Foreign Affairs*, Vol. 84, Issue 4, July-August 2005.

12	**The Challenge of Biodiversity** Millennium Ecosystem Assessment. Ecosystems and Human Well Being: Synthesis. 2005. Stuart Pimm and Clinton Jenkins, "Sustaining the Variety of Life," *Scientific American*, Vol. 293, No. 3, September 2005. Geoffrey Heal, Nature and the Marketplace, 2000. Chapter 4 Convention on Biological Diversity. Global Biodiversity Outlook. CBD: Montreal, 2001.
13	**The Challenge of Global Cooperation** Sachs, "Chapter 13: Achieving Global Goals," in Common Wealth

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number:EDUXXX

Curriculum Design Lebanese American University, Faculty of Arts and Sciences, Department of Education

Fall Semester, 2014

Instructor Information

Instructor: Dr. Rima Bahous
Office Location:
Telephone: Office +961 1 786456
Office Hours:
E-mail: rbahous@lau.edu.lb
Website: WWW.LAU.EDU.LB

Course Identification

Course Number:
Course Name: Curriculum Design
Course Location: University Campus
Class Times: N/A
Prerequisites: N/A

Faculty Web Page: WWW.LAU.EDU.LB

Course Description/Overview

The aim of the course is to review the history of curriculum development, analyse current curricular issues and develop a comprehensive curriculum based on climate change. The course introduces students to elements of curriculum theory and practice, in classical and contemporary approaches. It emphasizes the main issues related to curriculum design and models as reflected by research and the analysis of current curricular issues. Students are expected to reflect on ways various curriculum orientations may resolve modern issues or problems. They will evaluate curricula in terms of structural elements, tools, and assumptions regarding subject matter and learning. They are expected to design a comprehensive curriculum that incorporates the changes in the climate and the importance of educating youth accordingly.

Course Learning Objectives

Course Content Learning Outcomes

By the end of the course, students are expected to:

1. Discuss events related to the historical evolution of curriculum
2. Define terms associated with curriculum such as needs assessment, design, development, scope, sequence, articulation, integration, inclusion, etc.
3. Compare curriculum designs in terms of their characteristic features, strengths, and weaknesses
4. Distinguish among examples and characteristics of curriculum aims, goals, and objectives
5. Describe means of selecting and organizing content for curriculum
6. Discuss how societal/cultural influences play a role on curriculum development
7. Cite characteristics associated with comprehensive curriculum evaluation
8. Cooperate with colleagues in designing a concept-based curriculum which incorporates climate change and sustainability

Course Resources

Course Website(s)

Required Course Texts and Materials

Ainsworth, L. (2011). *Rigorous curriculum design: How to create curricular units of study that align standards, instruction, and assessment.* Colorado: Lead and Learn Press.

Ainsworth, L. & Anderson, K. (2013). *Getting started with rigorous curriculum design: How school districts are successfully redesigning their curricula.* Colorado: Lead and Learn Press.

Brown, J. L. (2004). *Making the most of understanding by design.* VA: Association for Supervision and Curriculum Development.

Carr, J. F. & Harris, D. E. (2001). *Succeeding with standards: Linking curriculum, assessment, and action planning*. Alexandria, Virginia: Association for Supervision and Curriculum Development.

Easton, L. B. (2002). *The other side of curriculum: lessons from learners*. Portsmouth, NH: Heinemann

Foshay, A.W. (2000). *The curriculum: Purpose, substance, practice*. New York: Teachers College Columbia University.
Frey, N., Fisher, D. & Moore, K. (2005). *Designing responsive curriculum: Planning lessons that work.* Lanham, MD: Rowman and Little fields publishers.
Glatthorn, A. A., Boschee, F., & Whitehead, B. (2006). *Curriculum leadership: development and implementation*. Thousand Oaks, CA: Sage Publications.
Gordon, E., Bridglall, B. L., & Meroe, A. (2005). *Supplementary education: the hidden curriculum.* Lanham: Rowman and Littlefield Publishers.
Harris, M., Hill, R., &Weimer, M. (2012). *The learner centered curriculum: design and implementation*. San Francisco: Jossey-Bass.
Mayes, C. (2003). *Seven curricular landscapes: an approach to the holistic curriculum*. Dallas: University Press of America, Inc.
Middlewood, D. & Burton, N. (Ed.) (2001). *Managing the curriculum*. London: Paul Chapman Publishing.
Oliva, P. (2001). *Developing the curriculum* (5th ed.). New York: Addison Wesley Longman.
Pinar, W. (2003). *What is curriculum theory?* New Jersey: Lawrence Erlbaum Associates, Publishers.
Posner, G & Rudnistsky, A.N. (2001). *Course design: A guide to curriculum development for teachers*. New York: Longman.
Richards, J. (2001). *Curriculum development in language teaching.* Cambridge: Cambridge University Press.
Schramm, S.L. (2002). *Transforming the curriculum: Thinking outside the box*. Lanham, Md: Scarecrow Press.
Sowell, E. J. (2005). *Curriculum: An integrative introduction*. (3rd ed.) Upper Saddle River, New Jersey: Merrill Prentice Hall.
Wang, H. Y. (2004). *The call from the stranger on a journey home*. New York: Peter Lang.
Wiggins, G. & McTighe, J. (2005). *Understanding by design* (expanded 2nd ed.) Alexandria, VA: Association for Supervision and Curriculum.

Various websites on curriculum design, climate change and curricula will be provided to students at a later stage.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

Grading Scale: *The official grading scale for LAU is as follows:-*

≥ 90	A
87-89	A-
83-86	B+
80-82	B
77-79	B-
73-76	C+
70-72	C
67-69	C-
63-66	D+
60-62	D
≤ 59	F

Grading Policy

The course grade is calculated according to the following:

Project 1	15
Project 2	15
Project 3	15
Project 4	20
Project 5	15

Course Policies.

N/A

APENDIX II: The CLIMASP Course Modules Template Example

Course	Curriculum Design
Module 1	Curriculum Instruction
Key Concepts	Definitions of curriculum and curriculum instruction
Overview	The various curriculum approaches will be discussed at length. Some of the approaches are the following: Behavioural, Managerial, Systems, Academic, Humanistic, and Reconceptualists. A thorough discussion of the various approaches will be conducted with the focus on the incorporation of climate change and sustainability in each approach.
Aim	Introduce curriculum and instruction and the various approaches.
Learning Outcomes	At the end of this module learners will be able to: • Recognize the various approaches to curriculum design • Distinguish among examples and characteristics of curriculum aims, goals, and objectives

	• Distinguish the various levels of curriculum
Units	Levels of curriculum, relationship between curriculum and instruction, curriculum products and processes and curriculum approaches.
Readings	Reading assignments will be made available on blackboard.
Activity	**Project 1** Report on Curriculum Giants (group presentations; individual written reports)
	Acquaint yourself with the philosophers who shaped what you do/will do for a living and to understand why it is important to study curriculum development and design. Select one of the leaders in the curriculum field to research and produce a two-page hand-out presenting information about this person and his/her major contribution to research and practice in school curriculum. Prepare a five minute presentation stating which curricular approach s/he favours. This should be written up and uploaded on blackboard. (APA Style) with complete references o Ralph Tyler o William H. Kilpatrick o Herbert Spencer o Hollis Caswell o Jerome Bruner o Franklin Bobbitt o Carl Glickman o Lawrence Stenhouse o Linda Darling-Hammond o David Pratt o John Goodlad o John Dewey
Module 2	Society and Culture

Key Concepts	Bases of curriculum
Overview	This module will cover the various aspects of curriculum organization which is based on the purposes of education, i.e., the subject matter, the needs of society and culture, and the needs and interests of learners. Most examples will be on the incorporation of climate change and sustainability as one of the main topics in the curriculum.
Aim	Recognize the various aspects of curriculum organization by giving examples on climate change.
Learning Outcomes	At the end of this module learners will be able to: • Define terms associated with curriculum such as needs assessment, design, development, scope, sequence, articulation, integration, inclusion, etc. • Compare curriculum designs in terms of their characteristic features, strengths, and weaknesses. • Distinguish among examples of characteristics of curriculum aims, goals, and objectives.
Units	Culture and the curriculum, curriculum organization, society and culture
Readings	Reading assignments will be made available on blackboard.
Activity	**Project**
	Choose one of the following topics. Research it well and present it in class. Your presentation should not exceed 5 minutes. Submit a 2000-word written report (APA Style) Green School Curriculum Student-Centred Curriculum Environment and the Curriculum Climate Change and Curriculum

	Curriculum and Community involvement Extracurricular Activities in Schools Curriculum and Global Warming
Module 3	Knowledge and Subject-Matter
Key Concepts	Knowledge related to school curricula
Overview	This module will review the conceptions of knowledge keeping in mind that knowledge requires active participation by the knower and thus the importance of including the most urgent issues such as climate change in the curriculum to inform the learners.
Aim	Communicate the importance of knowledge to inform learners.
Learning Outcomes	At the end of this module learners will be able to: • Distinguish among examples of characteristics of curriculum aims, goals, and objectives. • Describe means of selecting and organizing content for curriculum.
Units	Conceptions of knowledge, cognitive learning, affective attitude, psychomotor learning, application of knowledge and subject-matter studies
Readings	Reading assignments will be made available on blackboard.
Activity	**Project** Curriculum Issues Synthesis
	This assignment aims at a first initiation in writing academic reports and reflecting on research. It also aims at enhancing your habits of library search, acquainting you with the main present curriculum issues, and developing your ability to report on readings. Select debatable curriculum issues such as the hidden curriculum, curriculum

	and the environment issues, and freer curriculum. Search for readings about the selected issues (five articles in refereed journals or chapters in books that are recognized in the field). The paper will consist of the following: o An introduction (in your words) (10 lines) o Setting the stage for the issue (one page maximum) o A summary (10 lines) and a critique (1 page) (each article) o A synthesis including reflection on the issue and its impact on curriculum development (3 to 4 pages) o Reference page (APA style) o Copies of all articles
Module 4	Society and Learners
Key Concepts	Society, learners and culture
Overview	This module gives a general overview of the various cultural issues that should be incorporated in the curriculum within the fast economic and technological changes that are happening in the world; issues like family, society, relationships, the effect of climate change, and global warming will be discussed at length.
Aim	Recognize the importance of the society and the learners and their influence on curriculum design.
Learning Outcomes	At the end of this module learners will be able to: • Discuss how societal/cultural influences play a role on curriculum development.
Units	Curriculum and community, Family, society and relationships, purposes of education and content selection, nurture, nature and interaction
Readings	Reading assignments will be made available on blackboard.

Activity	**Project** Position Paper
	Present your own argument on the following topic: Climate Change and Sustainability should be incorporated in the K to 12 Curriculum Your position paper should be around 3000 words, APA Style, with a minimum of twenty references.
Module 5	Creativity and Curriculum Development
Key Concepts	Creativity, curriculum development
Overview	The preparation of learning experiences and assessment is the culmination of a curriculum project. In this module, learners will be required to develop their own creative curriculum whereby the issues of green curriculum, climate change and sustainability, the environment and global warming are incorporated.
Aim	Create own curriculum
Learning Outcomes	At the end of this module learners will be able to: • Cite characteristics associated with comprehensive curriculum evaluation • Cooperate with colleagues in designing a concept-based curriculum which incorporates climate change and sustainability
Readings	Reading assignments will be made available on blackboard.
Activity	**Project** Curriculum Development (group presentations; individual written reports)
	Assume you are the leader of a project team developing a new K to 12 curriculum which emphasizes climate change and sustainability. Develop a master learning schedule that would show a timeline and the key steps that

	you and your team would take. Present your project to the class (7 minute presentation). Write an individual reflective critical report (1500 words; APA style) on the project.

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

CIE 522

Environmental Impact Assessment

Department of Civil Engineering, School of Engineering

Lebanese American University

Fall Semester ……

Instructor Information

Instructor: Dr. Mazen M. Haydar

Office Location: Engineering 702
Telephone: Office
Office Hours: After class
E-mail: mazen.haydar@lau.edu.lb
Website:

Course Identification

Course Number: CIE 522
Course Name: Environmental Impact Assessment
Course Location: Zakhem 402 - Byblos Campus
Class Times: TR 4:00 – 5:15 PM
Prerequisites: None
Faculty Web Page:

Course Description/Overview

This course explores the study and evaluation of the impacts of large scale projects on the environment taking into account environmental laws and regulations and EIA guidelines, the identification of impacts, mitigation measures, and monitoring plans. Case study involving the preparation of an EIA Report is included.

Course Learning Objectives

The aim of this course is to introduce the environmental impact assessment (EIA) process, its elements, requirements and processes. The course will explore how to assess environmental potential impacts, identify respective mitigation measures, and develop an environmental management plan.

Course Content Learning Outcomes

At the conclusion of this course, each student will be able to do the following:

1- Evaluate the impacts of projects on the environment
2- Identify environmental laws related to EIA
3- Propose mitigation measures and environmental management

4- Take part of preparing an EIA report.

Course Resources

Course Website(s)

Required Course Texts and Materials

Selected readings from:
Eccleston, C. Environmental Impact Assessment: A Guide to Best Professional Practices. Boca Raton: CRC Press, 2011.
Pain, S.W. Safety, Health, And Environmental Auditing :A Practical Guide. Boca Raton: Taylor & Francis, 2010.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

Grading Policy

Evaluation of the student's final grade in the course will be based on his/her performance throughout the course and will be a combination of the following:

Item	Percentage
Term Paper (final report 25%, oral presentation 5%)	30%
Test 1	15%
Test 2	15%
Comprehensive Final Exam	40%

Completion of the online course evaluations is required. Students will not be able to access their course grades until they have completed the course evaluations.

Course Policies

Structure

Lecture	Two 75-minute lectures per week
Laboratory	None
Medium	All material explained in class and on the whiteboard
Tests	2 Tests-75 minutes - closed book
Final	120 minutes, comprehensive, closed book
Term Paper	Final report to be submitted, followed by a Class oral presentation.

Policy

Attendance

You are expected to attend all classes and arrive on time. Obtain prior clearance for planned absences.

Academic Integrity

The instructor will adhere to all LAU policies regarding academic integrity as stated http://www.lau.edu/policies.

Homework Policy

Assignments must be typed and must be turned in at the beginning of class on the day it is due, with no exceptions.

Exam Policy

No make-up for a test or a final will be given under any circumstance. In case of absence, the grade of the exam will be considered to be zero.

Cheating

Students caught cheating on an exam receive a grade of zero on the exam.

Course Schedule

Topic	Description
1	Background on environmental impact assessment
2	Law, policy, and institutional agreements
3	Public involvement
4	Screening
5	Scoping
6	Impact analysis
7	Mitigation and impact measurement
8	EIA reporting
9	Monitoring plan
10	Implementation and follow up
11	Case studies
12	Sustainability Impact Assessment
13	Strategic Environmental Assessment

APENDIX II: The CLIMASP Course Modules Template Example

Course	Environmental Impact Assessment
Module 1	**Legal and Administrative Laws**
Key Concepts	Initial environmental examination, environmental scoping, environmental impact assessment study, public hearing, analysis of alternatives, and environmental management plan.
Overview	In this module, we will explore the local laws and decrees governing the preparation of an EIA study, specifically the Lebanese Ministry of Environment Decree No. 8633. Which projects, actions or plans must undergo an EIA study? Which projects, actions or plans must undergo an initial environmental examination IIEE)? What are the main differences between an EIA study and an IEE study? What is the definition of an environmentally sensitive area? What is the definition of an environmentally sensitive receptor? What are the main requirements of an EIA study or an IEE study? We will define stakeholders and discuss the role of public hearing in the EIA process. We will address the objective of an environmental management plan (EMP) and the roles and responsibilities of various stakeholders. Also, will discuss the criteria for assessment of alternatives to a given project, action or plan. Furthermore, we will explore the main laws, decrees and conventions that might be applicable when conducting an EIA study.
Aim	The main objective of this module is to introduce the concept of environmental impact assessment, the main elements of an EIA study, the objective of such study and the laws governing EIA study preparation.
Learning Outcomes	The student shall be able to: • Identify the main requirements of Decree No. 8633

	• Determine whether an IEE or an EIA is needed for a given action.
Units	1.1 – EIA Decree 8633 1.2 – EIA Decree 8633 Annexes
Readings	*http://www.moe.gov.lb/The-Ministry/Laws-Regulations/Decrees.aspx*
Activity	Assignments: • Determine whether an IEE or an EIA is needed for a given action. • Identify environmentally sensitive areas receptors.
Module 2	**EIA Study**
Key Concepts	Environmental scoping document, public hearing, environmental baseline conditions, environmental impacts and mitigation measures, assessment of alternatives and environmental management plan.
Overview	This module will focus on how to conduct a comprehensive EIA study. We will investigate the various legal and administrative laws that may be applicable to a given project. Then, we will initiate the preparation of the environmental scoping document, which precedes the preparation of the EIA. Throughout the preparation of the environmental scoping document, we shall explore the main parameters involved in delineating the potential area of impact. In order to do so, we have to describe or quantify the baseline environmental conditions. This exercise will include biological elements (flora, fauna), climate, noise, air quality, water resources, topography, geology, waste management, cultural and historical value, visual amenity, and socio-economic conditions, etc. To each element described in the baseline environmental and socio-economic conditions, we will assess the magnitude of impacts and the methodology used for this assessment. Furthermore, we will address how to conduct a public hearing and to incorporate its results in the scoping document. The EIA study will complete the scoping document in addressing the significant environmental and socio-economic impacts. In the EIA study, mitigation measures will be provided to address these impacts. It is often that a resettlement action plan has to be prepared to mitigate socio-economic impacts. An assessment of alternatives has to be prepared in order to evaluate the impact these alternatives on the environment and costs. Finally, we will discuss the importance of preparing an

	environmental management and monitoring plan.
Aim	The main objective of this module is to breakdown the concept of environmental impact assessment study.
Learning Outcomes	The student shall be able to: • Identify applicable environmental laws and regulations. • Describe environmental and socio-economic baseline conditions • Evaluate the environmental and socio-economic impacts and prepare respective mitigation measures. • Understand the role of public hearing. • Conduct an assessment of alternatives. • Prepare an environmental management and monitoring plan.
Units	2.1 – Environmental Screening 2.2 – Environmental Scoping 2.3 – Categorization of Impacts 2.4 – Mitigation and Impact Measurement
Readings	http://elibrary.worldbank.org/doi/book/10.1596/0-8213-1844-6 Selected readings from: *Eccleston, C. Environmental Impact Assessment: A Guide to Best Professional Practices. Boca Raton: CRC Press, 2011.* *Pain, S.W. Safety, Health, And Environmental Auditing: A Practical Guide. Boca Raton: Taylor & Francis, 2010.* *Morris, P. and Therivel, R. Methods of Environmental Impact Assessment. Spon Press: London, 2001.*
Activity	Assignment: • Provide a critique for one or two case studies on environmental and social impact assessment. Potential projects include large-scale water dam, international golf course, photovoltaic power plants, etc. Project: • A group of three students will prepare a complete EIA report for a given project, program or action. The students have to select a project or program in Lebanon, contact the relevant municipalities or ministries,

	prepare a comprehensive environmental baseline assessment, study the impacts, propose mitigations, assess alternatives and prepare a comprehensive environmental management and monitoring plan. Each group will conduct an oral presentation of their work in class.
Module 3	**Sustainability Impact Assessment and Climate Change**
Key Concepts	Sustainability impact assessment (SIA), environmental management, strategic environmental assessment (SEA), environmental impact assessment, and air pollution control.
Overview	In this module, we will introduce sustainability impact assessment (SIA) and discuss the relationship the environmental management of large-scale projects, programs and action plans and climate change. We look at SIA, EIA and SEA as tools that address the control of impacts with respect to governing local, national and international laws, regulations and guidelines, including the latest regulations governing the degradation of air quality leading to climate change. Furthermore, we will explore the Lebanese Ministry of Environment Decree No. 8213 that dictates the purpose and guidelines for conducting a strategic environmental assessment. We will study the impact of conducting these assessments on national goals, which are associated with international treaties and protocols to limit degradation of air quality, climate change, and their impact on water resources.
Aim	The main objective of this module is to explore the relationship between environmental management of local, national and international projects and programs with the development of international environmental policies and regulations related to climate change.
Learning Outcomes	The student shall be able to: • Understand the objective of strategic environmental assessment • Understand the concept of sustainability impact assessment • Correlated the concept of environmental management with the formulation of international policies and treaties related to climate change.
Units	3.1 – Strategic Environmental Assessment

	3.2 – Sustainability Impact Assessment
Readings	http://www.moe.gov.lb/The-Ministry/Laws-Regulations/Decrees.aspx http://www.epa.ie/monitoringassessment/assessment/sea/ http://www.epa.gov/sustainability/analytics/sustainability-impact.htm Selected readings from: *Saunders, A. and Arts, J. (eds.) Assessing Impact: Handbook of EIA and SEA Follow-up. Earthscan: London, 2004.*
Activity	Project: • Prepare a term paper that addresses the relationship between strategic environmental assessment with developing international environmental policies and regulations. • Alternatively, prepare a term paper that addresses the relationship between sustainability impact assessment with the formulation of local environmental policies and regulations.

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

CIE 525

Environmental Policy & Management
Department of Civil Engineering, School of Engineering
Lebanese American University
Spring Semester ……

Instructor Information

Instructor: Dr. Mazen M. Haydar
Office Location: Zakhem 502 - Byblos
Telephone:
Office Hours: After class
E-mail: mazen.haydar@lau.edu.lb
Website:

Course Identification

Course Number: CIE 525
Course Name: Environmental Policy & Management
Course Location:
Course Time: MW 4:30 –5:45
Prerequisites: None
Faculty Web Page:

Course Description/Overview

This course explores human made problems in the environment parallel with concepts in environmental ethics, management and policies so as solutions are provided concerning preservation of the environment. Topics covered are toxic andsolid wastes, pollution of air, water and soil, international and national environmental ethics, management and policies.

Course Learning Objectives

The aim of this course is to introduce the main policies, regulations and standards related to water resources, soil, air and solid wastes. Also, this course will explore the role of environmental management in reducing and controlling environmental impacts.

Course Content Learning Outcomes

At the conclusion of this course, each student will be able to do the following:

1- Know about key environmental policies related to water.
2- Learn about indoor and outdoor air quality standards.
3- Learn about soil pollution and remedial actions.
4- Know about local environmental laws related to environmental protection.
5- Learn about solid waste landfills regulations.
6- Understand the concept of environmental management system.

Course Resources

Required Course Texts and Materials

Required Resources:

Selected readings from www.epa.gov

Optional Course Texts and Materials

None.

Assignments and Grading Scheme

Grading System

Grading Policy

Evaluation of the student's final grade in the course will be based on his/her performance throughout the course and will be a combination of the following:

Item Percentage
Term Paper (final report 15%, oral presentation 5%) 20%
Test 1 20%
Test 2 20%
Comprehensive Final Exam 40%

Completion of the online course evaluations is required. Students will not be able to access their course grades until they have completed the course evaluations.

Course Policies

Structure

Lecture:	Two 75-minute lectures per week
Laboratory:	None
Medium:	All material explained in class and on the whiteboard
Tests:	2 Tests-75 minutes - closed book
Final:	120 minutes, comprehensive, closed book
Term Paper:	Final report to be submitted, followed by a Class oral presentation.

Policies

Attendance

You are expected to attend all classes and arrive on time. Obtain prior clearance for planned absences.

Academic Integrity

The instructor will adhere to all LAU policies regarding academic integrity as stated http://www.lau.edu/policies.

Homework Policy

Assignments must be typed and must be turned in at the beginning of class on the day it is due, with no exceptions.

Exam Policy

No make-up for a test or a final will be given under any circumstance. In case of absence, the grade of the exam will be considered to be zero.

Cheating

Students caught cheating on an exam receive a grade of zero on the exam.

Course Schedule

Topic	Description
1	Source water assessment and protection
2	Human impact on water cycle
3	Water quality criteria and regulations
4	Soil contamination
5	Air pollution
6	Indoor Air Pollution

7	Lebanese laws related to environmental impact assessment
8	Lebanese laws related to medical waste regulations
9	Lebanese laws related to deforestation
10	Solid waste landfills regulations
11	Environmental Management System

APENDIX II: The CLIMASP Course Modules Template Example

Course	Environmental Policy and Management
Module 1	**Waste Resources**
Key Concepts	Source water assessment, point source and non-point source contaminants, water criteria, and source water protection policies.
Overview	In this module, we will highlight the importance of fresh water sources

	(groundwater, springs, etc.) and the impact of their quality on water treatment costs. We will conduct a source water assessment to protect the water sources, delineated the source assessment area, identify potential contamination sources (point source and non-point sources), and determine the susceptibility of source water to contamination. We will then study the impact of human activities on the water cycle, and most specifically on watershed. Following source water assessment, we shall explore different protection measures such as land use prohibition, land acquisition, permitting and others. We will discuss the steps that can be taken on the individual level and community level to help protect water sources.We will also introduce the key water protection programs such as clean water act (CWA) and safe drinking water act (SDWA) and present water criteria for drinking, domestic usage, irrigation and recreation. We will also discuss main indicators such as maximum contaminant level (MCL) and the total daily maximum load (TDML) for surface water bodies. We will conclude with a case study addressing transport of contamination from surface water bodies to sediments and vegetative crops.
Aim	The main objective of this module is to delineate source water assessment areas and propose protection policies.
Learning Outcomes	The student shall be able to: • Know how to delineate a source water assessment area • Identify potential contaminant sources • Determine suitable source water protection policies • Know about the different water criteria
Units	1.1 - Source Water Assessment 1.2 –Impact of Human Activities on Water Cycle 1.3 –Water Criteria
Readings	http://water.epa.gov/infrastructure/drinkingwater/sourcewater/protection/sourcewaterassessments.cfm http://cis.uchicago.edu/outreach/summerinstitute/2010/documents/sti2010-lessons-how_human_activities_impact_the_water_cycle.pdf *http://water.epa.gov/scitech/swguidance/standards/criteria/*

Activity	Assignments: • Identify potential contaminants and susceptibility of contamination in a given urban or rural setting.
Module 2	**Soil Contamination**
Key Concepts	Delineation of soil contamination, soil vapor intrusion and soil remediation.
Overview	We will start with a brief introduction on potential sources of soil contamination and commonly occurring soil contaminants. We will explore the various standards related to soil criteria based on various landuses. Furthermore, we will address the different programs related to cleanup and remediation of soil contamination. These programs include a site investigation plan, a remediation action plan, and an extensive monitoring plan to ensure that any contaminated site is meeting the minimum applicable standards for remediated sites. Finally, we will evaluate potential environmental management procedures to remediate contaminated sites.
Aim	The main objective of this module is to introduce soil contamination, its transport and fate and potential remedial solutions.
Learning Outcomes	The student shall be able to: • Understand the extent of soil contamination • Know the criteria used for selecting soil remediation techniques
Units	2.1 – Soil Contamination 2.2 – Soil Clenaup Criteria
Readings	http://www.epa.gov/superfund/students/wastsite/soilspil.htm http://www.epa.gov/superfund/health/conmedia/soil/cleanup.htm

Activity	Assignment: • Evaluate soil treatment alternatives for a given urban or rural setting.
Module 3	**Air Pollution**
Key Concepts	Indoor and outdoor air pollution, air quality index, policies related to controlling air emissions.
Overview	In this module, we shall address both outdoor and indoor air pollution. We will discuss the main sources of air pollution such as power plants, cement factories, landfills, etc. and the transport and fate mechanisms of air pollution. After studying the impact of air pollution on the environment and specifically human health, we will address the need for regulating air pollution parameters. We will explore the main criteria pollutants that are regulated and their health impacts. We shall introduce the concept of air quality index that correlates between the levels of air pollution and health impacts. The Lebanese quality of index will also be addressed as well as the main efforts done locally to create a comprehensive database of air pollution measurements. Following the study of air pollution sources, their impacts and regulations, we will present policies and management measures to control and reduce air pollution. Such measures include individual initiatives and governmental policies. Indoor air pollution is of major concern due to their common occurrence in households, institutions and work places. Although indoor air pollution is not regulated, however, extensive guidelines are available to control and minimize occurrence of this pollution. ASHRAE standards are presented in order to be familiar with mechanical requirements related to air ventilation. We will address the health impacts of various indoor pollutants (microbial organisms, dust, fungi, asbestos, radon gas, etc.), their testing methods, and propose solutions to reduce the indoor air pollution to acceptable levels.
Aim	The main objective of this module is to explore the main sources of air pollutants (indoor and outdoor) and study the environmental policies (local and international) and guidelines related to the control of these pollutants.
Learning Outcomes	The student shall be able to: • Know the main criteria pollutants

	• Evaluate the advantages and disadvantages of waste transformation using composting and combustion
Units	3.1 –Outdoor Air Pollution: Sources, Concerns, and Standards 3.2 – Environmental Policies & Technologies for Reducing Outdoor Air Pollution 3.3 – Indoor Air Pollution
Readings	*http://www.epa.gov/air/criteria.html* *http://airnow.gov/index.cfm?action=aqibasics.aqi* *http://www.epa.gov/air/caa/peg/cleanup.html* *http://www.epa.gov/iaq/ia-intro.html*
Activity	Project: • Prepare a term paper that addresses indoor or outdoor air pollution policies and technologies and their impact on the environment and the economy.
Module 4	**Landfill Regulations**
Key Concepts	Landfill gas emissions, leachate discharge requirements and landfill liner regulations.
Overview	The focus of this module will be on the environmental regulations related to landfill permitting, design and operation. The social and environmental risks associated with the landfill process make it a challenge to site new landfills. To permit new landfills, one must evaluate climatic, physical, hydrogeological, social and environmental conditions of a candidate landfill site. Furthermore, all waste operations must be controlled and monitored, starting with monitoring of incoming wastes and keeping records of accepted waste quantities to monitoring the application of daily cover and maintaining leachate seeps. Landfill gas air emissions must be controlled and are regulated to ensure minimal environmental risks. Similarly, leachate discharges must be treated to meet minimal standards for discharge into sewage network or additional treatment. Additional environmental regulations are related to leachate evaporation, leachate recirculation, and maintaining safe leachate head on the liner. Periodic sampling of groundwater monitoring wells and gas monitoring wells

	should be conducted to ensure environmental groundwater and air quality standards are met during the lifetime of the landfill and in the post-closure care period. Finally, regulation related to the liner system and the leachate collection system will be explored in this module.
Aim	The main objective of this module is to introduce the main environmental regulations related to landfill liner systems, landfill operation and environmental monitoring.
Learning Outcomes	The student shall be able to: • Know the criteria for landfill siting and the design requirements • Know about environmental policies and regulations governing environmental monitoring of landfill during lifetime and in post-closure care
Units	4.1 – Regulations related to landfill liner systems 4.2 – Environmental Monitoring for Landfills
Readings	Chapters 11 and 16 *Integrated Solid Waste Management: Engineering Principles and Management issues, 1993, by George Tchobanoglous, Hilary Theisen, and Samuel A. Vigil, McGraw-Hill Eds.* *http://www.epa.gov/epawaste/nonhaz/municipal/landfill.htm*
Activity	Project: • Prepare a term paper that evaluates environmental regulations related to landfill permitting, operation, and environmental monitoring between USA, Europe and Lebanon.
Module 5	**Environmental Management**
Key Concepts	ISO certification, environmental management system, environmental policy, environmental objectives and targets, and environmental compliance.
Overview	In this module, we will present the objective of ISO certification and specifically ISO14001 that addresses environmental management systems (EMS). After presenting the main advantages of the ISO certification, we shall discuss its major requirements and operational challenges. We will introduce the concepts

	of environmental policy, environmental aspects, and environmental objectives and targets. We will explore human and financial resources and training and quality controls needed to successfully implement an EMS. Furthermore, we will address the commitment to environmental communication to satisfy environmental standards and client requirements. Finally, we will present case study on the application of EMS for a civil engineering project during design, construction and operation phases.
Aim	The main objective of this module is to explore the environmental management system requirements for complying with the ISO 14001 EMS certification.
Learning Outcomes	The student shall be able to: • Identify the main requirements of the EMS • Prepare an environmental policy • Identify environmental objectives and targets.
Units	5.1 – Environmental Management System
Readings	*Hand notes prepared by the Instructor.*
Activity	Assignment • Prepare an environmental policy and determine environmental objectives and targets for a University project.
Module 6	**Legislative Environmental Laws and Regulations**
Key Concepts	Climate change relation to solid waste management, waste to energy, and landfill greenhouse gas emissions.
Overview	The local environmental Law No. 444 is explored throughout this module. This law defines the main environmental responsibilities of the government, the private sector and individuals. It dictates the main environmental measures related to protecting surface water bodies, the groundwater, and soil and air quality. It also introduces the structure and requirements of the environmental impact assessment (EIA) studies and the process of environmental auditing. Furthermore, we will explore throughout this module various environmental laws related to the preservation of forests and compensation plans related to replantation of cleared trees. We will also explore the law of medical wastes by studying the main acceptable treatment technologies, main requirements for

	waste separation, and safe handling and storage of medical wastes.
Aim	The main objective of this module is to explore the impact of solid waste strategies on the release of air emissions and greenhouse gases and to develop sustainable measures to reduce the impact of solid wastes on climate change.
Learning Outcomes	The student shall be able to: • Identify relevant and applicable laws related to environmental management and environmental protection. • Understand the governmental and individual roles and responsibilities related to environmental protection.
Units	6.1 – Lebanese Environmental Law 6.2 – Compilations of laws and decrees related to environmental protection
Readings	http://www.moe.gov.lb/The-Ministry/Laws-Regulations.aspx
Activity	Project: • Prepare a term paper that explores the impact of local regulations and lack of environmental enforcement on environmental degradation and propose any new amendments that may contribute in enforcing environmental protection.
Module 7	**Environmental Policies on Climate Change**
Key Concepts	Climate impact on the water cycle and air quality and the environmental policies related to control of air quality and climate change.
Overview	Climate change has been the topic of the last decade. A universal target was established to control and reduce climate change due to massive impact on our lives. The Environmental policies related to the protection of air and water quality have paved the road to understand the reasons for the development of climate change and in turn to understand the impacts induced by climate change on air and water quality. In this module, we shall explore the impact of climate change of the water cycle. Also, we will explore the impact of increasing temperature on the formation of ozone and the frequency and severity of summer smogs. We will study the contribution of ozone formation and particle pollution to the

	occurrence of climate change. The types of particle pollution may dictate the type of impacts on air quality and can cause direct and indirect impact on climate change. In addition, we will present the latest international agreements related to controlling climate change and the role and responsibility of the main industrial countries in fulfilling their respective targets in reducing air pollution. Lebanon's role in controlling climate change will also be addressed in this module.
Aim	The main objective of this module is to explore the environmental policies related to controlling climate change and to study the impact of climate change on air and water quality.
Learning Outcomes	The student shall be able to: • Identify environmental policies related to climate change and air quality. • Understand the interchange between climate change and control of air emissions.
Units	7.1 – Introduction to Climate Change 7.2 – Environmental Policies Related to Climate Change
Readings	*http://www.epa.gov/climatechange/* *http://www.epa.gov/climatechange/ghgemissions/* *http://www.epa.gov/climatechange/reducing-emissions.html* *http://www.epa.gov/climatechange/science/indicators/* *http://www.epa.gov/climatechange/impacts-adaptation/* *http://www.epa.gov/climatechange/impacts-adaptation/water.html*
Activity	Project: • Prepare a term paper that addresses the impact of degrading air quality and changes in climate change on the urban and rural environment.

Course Syllabus

BIO 222

Environmental Pollution Risk & Health

Lebanese American University (LAU),

Semester, Fall 2014

Instructor Information

Instructor:	A/Prof. Christian Khalil
Office Location:	Bloc A, room 805, Jbeil Campus
Telephone:	Office – +961 9 547 262 Ext 2466
Office Hours:	Tuesday 8:00 – 14:00, Thursday 8000 – 14.00
E-mail:	Christian.khalil@lau.edu.lb
Website:	

Course Identification

Course Number:	**Bio 203**
Course Name:	**Environmental Pollution Risks and Health**
Course Location:	FREM 403 – Jbeil Campus
Class Times:	Tuesday 11:00– 12:15, Thursday 11:00 – 12:15
Prerequisites:	N/A
Faculty Web Page:	http://www.lau.edu.lb

Course Description/Overview

This course introduces the current and fundamental knowledge in the area of environmental pollution and health risks. Covered are the current global legal frameworks that affect environmental pollution and health risks. The role of the environmental hygiene professional will be explored in guest lectures and tutorials.

The aims of the course are to introduce students to the basic knowledge in environmental health risks and gradually enhance their knowledge and understanding of the key concepts in the field.

The modules will provide students with an overview of issues faced by environmental professionals including health impacts.. The modules are articulated in such a way so as to cater for students with different backgrounds as the modules gradually move from general environmental issues to more specific topics in the field

Course Learning Objectives

The learning outcomes in this course include for you to demonstrate a good understanding of environmental issues, their health and legal requirements, global warming, climate change, health risks and methods for assessing, mitigating and cleaning up environmental contamination.

At the completion of the course students are expected to have gained the essential knowledge to:

1. Managing healthy environment- policy perspective,
2. Environmental health- Legal Perspective,
3. Health and environment links,
4. Environmental Toxicology,
5. Health Risk Assessment,
6. Environmental Risk Assessment,
7. Physical Principles, Ocean and Atmosphere,
8. Food and health,

9. Climate Change, food availability and health,
10. Pollution and health,
11. Health and management systems
12. Role professional Practice issues.

Course Content Learning Outcomes

When completing this course, students will be able to

1. Use a number of databases in addition to reading a number of scientific articles introduced in the modules as additional readings. It is hoped that this exercise will help students in understanding the scientific literature and referring to it in writing their assignments and mini reports.
2. Develop an in-depth engagement with the relevant disciplinary knowledge in its interdisciplinary context. This will be facilitated by a number of guest lecture presenting topics ranging from weather to contaminated site assessments on top of the range of topics presented by the course coordinator.
3. Use analytical and critical thinking and creative problem-solving through the application of the knowledge gained in the course to some case studies scenarios. Furthermore the analytical ability of students will be assessed through the introduction of some simple mathematical formulas relevant to some aspects of environmental health.
4. Student will be challenged to engage in independent and reflective learning. The course is structured to allow students to study at their own pace especially in the distant version. The reflective learning is mainly achieved by presenting to the student the opportunity to constructively criticize one of the modules in the course and come up with innovative ideas and concepts to make the contents more interesting and motivating to future students.
5. Students will refine their skills in appropriately locating, evaluating and using the relevant information in writing their reports and weekly assignments. Students are encouraged to critically analyse the literature presented in their assignment and discouraged from copying and pasting from the web.
6. Student will develop initiative and creativity and this will be rewarded and taken into account in the marking scheme for the various assessments in this subject.

7. Some students working in the industry might find the first 2 modules not so challenging as they discuss some general aspects. This aspect of the course was needed to help cater for the diversity of students taking this course and the fact that some students lack some of the essential requirements for understanding the key concepts.
8. Students will also benefit from exposure to international concepts associated with the environmental health. The subject tries to correlate state local and international laws and regulations in order to provide the students with an overview of the global impacts resulting from the actions of individual countries..
9. Science is ever-changing and we strive in this subject to keep track of the changes and appreciate this change. All new scientific discoveries and events are considered and inserted into the subject curricula within 1 semester. Students are kept up to date with the scientific changes through news articles and additional readings and streaming videos mainly through the Blackboard portal.
10. Ethical practices and social responsibilities are important components of any curricula and this is also important in environmental health. Whole modules in the subject addresses these important aspects and familiarize students with the importance of ethical practices and the challenges faced every day by scientific professionals and how to rise to those challenge.
11. Lastly the subject aims to develop some of the skills needed for effective communication. Class students are given the opportunity to present a PowerPoint talk on a hot environmental topic they are passionate about.

Course Resources

The chapters of the textbooks (Greipsson 2011 (G); Miller and Spoolman 2012(MS)) pertaining to each lecture are provided in the following tentative schedule. You are encouraged to complete reading the chapter pertaining to a lecture before you come to that lecture

Optional Course Texts and Materials

N/AAssignments and Grading Scheme

Grading System

Grading:

Grading will be as follows:

1. 12 Weekly Module Problems 60%
2. 3 mini reports ** 40%

*Students must pass both forms of assessment to pass course.
** See list of topics for reports.

Topic Report 1:
Write a research paper on Environmental industrial pollution and health risks using a literature review. This should be supported by case studies, preferably local and international cases.

We expect students to have read at least 6 current papers in the area. Use case studies and examples where relevant to support your views.

Topic Report 2:

A case study on Environmental Pollution, Risk and Health, focusing on m and policy
Use case studies and examples where relevant to support your views.

Topic Report 3:
The students will need to select one of the course modules and critically review it, improve it and update it if needed. Students are also encouraged to expand on some of the issues mentioned in the modules. The assessment of the updated module will be based on the graduate student input, scientific accuracy and presentation. The module review should attempt to update the materials presented in the modules using books and articles and reliable information from the scientific literature. Adding figures, pictures and other

material to make the modules more interesting is also recommended. The module submitted by the students can potentially be used in updating the course notes.

There will be no make-ups for any missed exam, assignment or assessment!!

Course Policies

Student Conduct:
In this course, you will develop an appreciation of the importance of honesty and integrity in scientific conduct. You will be expected to adhere to the Lebanese American University's honor code and student code of conduct at all times. I will not tolerate any plagiarism, cheating on exams, failing to participate in group work, and engaging in disruptive behavior in the lecture. Kindly report any violations of the honor code to me as soon as possible.

Policy on Cheating and Plagiarism:
Students caught cheating on an exam/quiz/assessment will receive a grade of zero on that exam/quiz/assessment in their first cheating attempt and receive a warning. Students caught cheating for the second time will receive a grade of "F" in the course and another warning.

Plagiarism on assignments and project work is a serious offense. If plagiarism is detected, a student will be subject to penalty, similar to the cheating case, which ranges from receiving a zero on the assignment concerned to an "F" in the course in addition to a warning.

All written work submitted to me (in any form) should include the following statement *in verbatim*: "In completing this work, I have abided by the Honor Code of the Lebanese American University." The statement should be signed.

Attendance Policy:
You are expected to attend all lectures. You will be responsible for all announcements made and material covered in any class you miss. Lectures start at 8:00 AM sharp; you may be denied access to class that day if you arrive more than 10 minutes late. Once you are in class, you cannot leave for any reason. If you choose to leave, you cannot come back and you will be considered absent for that day.

Please note that missing one third the lectures implies that you will have to drop the course. This is a university policy and will be strictly enforced.

Scheduled field trips constitute part of the course. You are expected to arrive on time on the day of the field trip. We will not wait for you if you are late. **Missing a fieldtrip is equivalent to missing three lectures.** Due to the nature of fieldtrips, students are expected to obey classroom rules during these trips. Smoking in the bus will **not** be tolerated but may be allowed during rest stops. Students leaving the group at any point during the fieldtrip do so at their own risk and may be issued a warning. Students may be allowed off the bus on the way back at the instructor's discretion. **Please bear in mind that a field trip is not a picnic or a hike!!**

Withdrawal Policy:
According to the university catalog, "Students wishing to withdraw from one or more courses must follow the withdrawal procedure provided by the Registrar's Office. Students withdrawing from courses after the late registration period and before the withdrawal deadline will receive Ws for all the courses in progress." **Please note that the last day to withdraw from classes this semester (please check with registrar.) Students wishing to withdraw the course must do so by themselves.**

Other Policies:
Exams: Exams will cover all the material discussed in class (including videos, guest lectures and assigned readings). There will be no make-ups for missed exams. A missed exam will receive a grade of zero. All exam grades count and none will be dropped. You are required to bring your IDs to exams. Cell phones and pagers must be turned off and put away during exams.

Class Conduct and Participation: You are expected to be physically and mentally present in all lectures. Eating, drinking and smoking are prohibited during class time. Cell phones and pagers must be turned off or set to silent mode during the lectures. They must also be out of sight. **If I see cell phones or pagers, they leave with their owners.** Disruptive behaviour will not be tolerated in class and will be handled according to the university rules and regulations.

In-class activities may be given any time during the lecture. These may include out-door or in-door activities. They may also include short-answer questions, short essay questions or interpretation of graphs and/or tabular data.

You will not be allowed to make-up missed activities or assignments.

Difficulties and Special Needs:
If you are experiencing difficulties with course content or with anything that I can help you with, please let me know. Also inform me as soon as possible of any special needs you might have, particularly medical conditions that may require special accommodation.

Conflict Resolution:
If you are having problems with another student in the class, please bring it to my attention. If you have problems with me, please let me know as soon as you can. Any issues that we cannot resolve can be taken to the chairperson of the Department of Natural Science, Prof. Ahmad Kabbani.

Changes:
I reserve the right to make reasonable changes to this syllabus provided that I give all students registered in the class a timely notification of the changes to be made.

Disability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week of Assignment	Topic	Reading
Week 1	• Managing healthy environment-policy perspective,	Course Notes
Week 2	• Environmental health Legal Perspective	Course Notes
Week 3	• Health and environment links	Course Notes
Week 4	• Environmental Toxicology	Course Notes
Week 5	• Health Risk Assessment	Course Notes
Week 6	• Environmental Risk Assessment	Course Notes
Week 7	• Physical Principles, Ocean and Atmosphere	Course Notes

Week 8	• Food and Health	Course Notes
Week 9	• Climate Change, food availability and health,	Course Notes
Week 10	• Pollution and Health,	Course Notes
Week 11	• Health and Management Systems Issues	Course Notes
Week 12	• Role Professional Practice	Course Notes

Course	Environmental Pollution Risk & Health
Module 1	Managing healthy Environment – Policy Perspective
Key Concepts	The chapter will address the following concepts: 1. Environmental health Policies 2. Defining environment and environmental health 3. Environmental health case studies 4. Human interaction with the environment 5. The Scientific method approach
Overview	The chapter will introduce key concepts in environmental health. It will also provide an overview of the key terms relevant to the subject matter. A number of case studies will be included.
Aim	The aims of the chapters are: 1. Introduce students to key concepts in environmental health 2. Get student to understand environmental policy and the key riole they play in managing health 3. Understand key interaction of humans with their environment from a health perspective
Learning Outcomes	The learning outcomes are : 1. Student to be able to explain environmental health policies 2. Understanding environment and its connection to health 3. Student ability to understand and analyse literature in the form of case studies 4. Understanding the linkages between human interaction and the environment
Units	Chapter 1 in Provided Notes
Readings	1. Allaby M. (2000). Basics of environmental science. Second edition, Routledge, London, UK 2. Beder, S. (1996). *The Nature of Sustainable Development. Scribe, Newh*

Victoria.
3. Cromar, N., Cameron., S., Fallowfield, Environmental Health in Austral and New Zealand, Oxford Press, 2004.
4. Frumkin H, Environmental Health, From Global to Local Second editic John Wiley and Sons, Second edition, 2010.
5. http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPOVERTY/0,,contentMDK:22569747~pagePK:148956~piPK:216618~theSitePK:336992,00.html
6. http://www.un.org/esa/socdev/unyin/documents/ydiDavidGordon_poverty.pdf
7. http://www.livingandleisure.com.au/green-initiatives;
8. http://www.health.gov.au/internet/main/publishing.nsf/content/79 6839F2B2FA6CA2572D40008D566/$File/enHealth%20NEHS%20fi %20for%20web%20Nov%2007.pdf
9. IGAE (1992). *Intergovernmental Agreement for the Environment*.
10. Lal, R., Uphoff, N., Stewart, B.A., Hansen, D.O. (2005) Climate Change and global food security, CRC press ISBN 0-8247-2536-0.
11. Manahan SE. (1997). Environmental Science and Technology, Lewis Publishers.
12. McAllister, DM. *Evaluation in Environmental Planning: Assessing Environmental, Social, Economic, and Political Trade-offs.*, MIT Press, 1980.
13. Murck ., B. (2005) Environmental Science – A self teaching guide. John Wiley & Sons. ISBN 0-471-26988-3.
14. Thompson, C., Wadhia, K., Loibner, A.P (2005) Environmental Toxicity testing, CRC Press ISBN 0-8493-2399-1
15. Van Dieren, W. (1995). *Taking Nature into Account: A Report to the Club of Rome*. Springer-Verlag.

	16. WHO: http://www.who.int/topics/environmental_health/en/ 17. Yassi, A., Kjellstrom T., Kok, T., Guidotti, T . Basic Environmental Health, Oxford University press, 2001.
Activity	
	Online activities on Blackboard such as: 1. Ecological foot print exercise 2. Population growth exercise **3.** Health implications from environmental pollution of a river system in China
Module 2	Environmental Health – Legal Perspective
Key Concepts	The following key concepts will be addressed: 1. Basics of Law;' 2. Law operation (case study Australian law) 3. Public health law- an International perspective
Overview	The lecture today will be divided into three distinct parts. The first part will introduce the reader to the basics of law; the second part will discuss the Law Operation, the third part will address environmental legislation while the fourth section will focus on public health laws. This approach is mainly aimed to showcase the sophisticated environmental legislation and the severe penalties for breaches which should be mirrored in public health legislation.
Aim	Introduce students to Environmental legislative requirements and their connection to Environmental Health Laws
Learning Outcomes	The learning outcomes from this chapter are : 1. Students understand the basics of law as applied to environmental and health. 2. Understanding the consequences of breaching environmental and public health legislation;

Units	Chapter 2 in the provided Notes
Additional Materials	1. Evironmental Law in Australia, 5th Edition, Butterworth Sydney. 2. Beder, S. 1996. The Nature of Sustainable Development. Second edition. Scribe Publications, Newham, Australia. 3. Birnie P., Boyle A., 2002 International law and the Environment, Oxford University Press. 4. Boer B.W.,Rothwell DR, 1995 From Franklin to Berlin: The internationalization of Australian environmental law and policy. Sydney Law review v17:242-277. 5. Cameron , J., Abouchar, J, 1991, 'The Precautionary Principle: A Fundamental Principle of Law and Policy in the Protection of the Global Environment', Boston College International and Comparative Law Review vol 14 pp:1-27. 6. Carvan, J, 2002, 'Understanding the Australian Legal System', LBC Information Services, Australia.. 7. Cromar, N., Cameron., S., Fallowfield, Environmental Health in Australia and New Zealand, Oxford Press, 2004. 8. Environmental Health in Australia and New Zealand, 2004, Chapter 11, Edited by Dr. Nancy Cromar, Scott Cameron, Dr Howard Fallowfield, OXFORD University press, ISBN: 9780195510041 9. Farrier, D, 2002, 'Fragmented law in fragmented landscapes: the slow evolution of integration natural resource management legislation in NSW, 19EPLJ89. 10. Farrier D., Lyster, R, & Pearson, L, 1999, 'The Environmental Handbook: Planning and Land Use in New South Wales', Butterworths, Sydney. 11. Fisher, D, 200, 'Australian Environmental Law', LBC Information Services, Australia. 12. Freestone, D, 1994, 'The Road from Rio: International Environmental

Law after the earth summit', Journal of environmental Law vol 6 pp:193-218.
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14. Gardner, A, 1994, 'Federal intergovernmental co-operation on environmental management: a comparison of developments in Australia and Canada', Environmental and Planning Law Journal vol 11 pp: 1-4-136
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19. Khalil C. (2007). Environmental Sustainability, in Australian Master OHS and Environment Guide - 2nd editions (2007) ISBN 978-921223655
20. Kirby, Justice Michael: **Human Rights and the HIV Paradox.** *Lancet* 1996, **348:**1217-8
21. Lawson, C, 2002, 'Risk Assessment in the Regulation of Gene Technology', 19EPLJ.
22. Ludlow, K, 2004, 'Genetically modified organisms and pollution in Victoria', Environmental and Planning Law Journal vol 21 p351.
23. McDonald, L., Bradshaw, S & Gardner, A, 2003, 'Legal Protection of Fauna Habitat in Western Australia', Environmental and Planning Law Journal, vol 20 p:95.

24. McIntosh, A, 2004, 'Why the Environment Protection and Biodiversity Conservation Act's referral, assessment and approval process is failing to achieve its environmental objectives', 21 EPLJ 288.
25. McMillan , John : **'The Constitutional Power of the Commonwealth in Public Health' in The Australian Institute of Health Law and Ethics (ed):.** *Public Health Law in Australia – New Perspectives* 1998.
26. **Model State Emergency Health Powers Act (USA)** [http://www.publichealthlaw.net/MSEHPA/MSEHPA2.pdf]
27. Morris, G., Cook., Creyke, R., Geddes, R., & Holloway, I, 2001, 'Laying Down the Law', Butterworths, Sydney.
28. Nagorka, F, 2003, 'Saying what you mean etc: precaution, science and the importance of language', Environmental and Planning Law Journal, vol 20 P: 211.
29. NSW Legislation search:
30. [http://www.legislation.nsw.gov.au/maintop/search/inforce]
31. Preston B., Adam P, 2004, 'Describing and listing threatened ecological communities under the Threatened Species Conservation Act 1995 (NSW)', Environmental and Planning Law Journal vol 21 pp250 and 372.
32. Raff, M, 1997, 'Ten Principles of Quality in Environmental Impact Assessment', Environmental and Planning Law Journal vol 14 pp:207-221.
33. Reynolds , Chris : **'Forms of Public Health Law – A General Outline' in The Australian Institute of Health Law and Ethics (ed).**
34. Sands, P, 2003, 'Principles of International Environmental Law', Cambridge University Press.
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	Operation of the Gene Technology Act 2000', Environmental Planning and Law Journal vol 20 pp 245. 38. United Nations Environment Program, 1997, 'Introduction to Environmental Law Relating to the Environment' in Environmental Law Training Manual, UNEP. 39. Yassi, A., Kjellstrom T., Kok, T., Guidotti, T . Basic Environmental Health, Oxford University press, 2001.
Activity	
	Online activities on Blackboard such as: 1. Identifying Legal requirements for opening a new Refinery in the USA 2. International Law as applied to companies operating Internationally **3.** Using databases to resercah Information on Environmental and Haelath Laws
Module 3	Health & Environmental Links
Key Concepts	Linking Health and Environment
Overview	With the onset of the twenty-first century, populations gained better awareness of their surroundings, especially their natural environment. We have a better appreciation of our natural environment, its importance, and the distinct cross-links between a healthy environment and population health. I would like to start this module by expanding on the definitions presented in Module 1 on Health and elucidate the underlying links with environment.
Aim	Basic understanding by students of the close linkages between Environment and health

Learning Outcomes	The students are expected to: 1. Have learned about Environment and health and the connections between the two disciplines. 2. Understand Environmental Stressors 3. Understand agricultural development health risks 4. Understand links between malnutrition and health
Units	Chapter 3 in the books
Readings& additional resources	1. Barton, B. (2002) Stress in Fishes: A Diversity of Responses with Particular Reference to Changes in Circulating Corticosteroids A Integr. Comp. Biol. 42: 517-525. 2. Danennberg A.L (2008) Use of health Impact assessment in the US: 27 case studies: 1999-2007. American Journal of Preventive medicine 34(3):241-256. 3. Duarte-Davidson R, Courage C, Rushton L, Levy L 2001, 'Benzene in the environment: an assessment of the potential risks to the health of the population', Occupational Environmental Medicine, (58) 1: 2-13. 4. Energy Information Administration (EIA) Natural Gas (1998): Issues and Trends. Washington D.C: Energy Information Administration 1999. 5. Finkelstein, E.A., Fiebelkorn, I.C., Wang, G. (2003) National medical spending attributable to overweight and obesity: How much and Who is paying? Health Affairs ; http://nepc.colorado.edu/files/CERU-0305-71-OWI.pdf 6. Fisher GW, Rolfe KA, Kjellstrom T, Woodward A, Hales S, Sturman AP, Kingham S, Petersen J, Shrestha R, King D. (2002) Health effects due to motor vehicle air pollution in New Zealand, a report submitted to the Ministry of Transport, Wellington, New Zealand. 7. Frumkin, H., Hess, J, S. (2007) Peak petroleum and public health. JAMA, 298(14):1688-1690. 8. Hendrickson R.G., Chang A., Hamilton R.J. (2004) Coworker fatalities

from hydrogen sulfide. American Journal of Industrial Medicine. 45(4):346-350.
9. Hirsch R. L., Bezdek, R., Wendling, R. (2005) Peaking of World oil production, mitigations and risk management Science. Application International Cooperation Report for the US Department of Energy.
10. Kirkeleit, J., Riise T.,Braveit, M., Moen, B.E. (2008). Increased risks of acute myelogenous leukemia and multiple myeloma in a historical cohort of upstream petroleum workers exposed to crude oil. Cancer Causes and Control 19 (1):13-23.
11. Manins P, Allan R, Beer T, Fraser P, Holper P, Suppiah R and Walsh K 2001, Atmosphere, Australia state of the environment report 2001 (theme report), CSIRO Publishing on behalf of the Australian Government Department of the Environment and Heritage, Canberra.
12. Mills, S.P.K., Newell, G.R. and Johnson, D.E. (1981) Testicular cancer associated with employment in agriculture and oil and natural gas extraction. Lancet, 207-110.
13. Morgan G, Jalaludin B 2001, Health costs of vehicle emissions in Sydney, New South Wales Environmental Protection Agency Consultancy Study, Sydney.
14. Pelletier, D.L (1994) The Potentiating effects of malnutrition on child mortality: epidemiological evidence and policy implications, Nutrition Review 52: 409-415.
15. Rericha, V., et al. (2006). Incidence of Leukemia, Lymphoma and Multiple Myeloma in Czech Uranium Miners, a case study. Environmental Health Perspective. 114(6): 818-822.
16. Swanson K.J., Madden, M.C., Ghio, A.J. Biodiesel Exhaust: the need for Health effects research, Environmental Health Perspective. 115(4): 496-499.

17. United Kingdom. Department of the Environment (1994) Expert Panel on Air Quality Standards: Benzene, London: HMSO.
18. Websites:
    - http://www.medicinenet.com/script/main/art.asp?articlekey=10074
    - http://airnow.gov/index.cfm?action=aqibasics.aqi.
    - http://www.environment.nsw.gov.au/aqms/aqi.htm
    - http://www.eoearth.org/
    - http://www.oxfamblogs.org/fp2p/?cat=60&paged=2
    - http://ih887.pbworks.com/w/page/5284037/Malnutrition
    - http://documents.wfp.org/stellent/groups/public/documents/liaison_offices/wfp185786.jpg
19. WHO. Health and Environment in Sustainable Development: Five years after the earth summit. Geneva: World Health Organisation1997.
20. WHO (2000), Air Quality Guidelines for Europe, second edition, World Health Organization Regional Publications, European Series, No. 91, Geneva.
21. WHO. The World Health Report 2002: Reducing Risks, Promoting Healthy Life. Geneva: World Health Organization 2002.
22. WHO The SuRF Report 2: Surveillance of chronic disease Risk Factors WHO, 2005.
23. WHO.int, Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19–22 June 1946; signed on 22 July 1947 by the representatives of
24. States (Official Records of the World Health Organization, no. 2, p. 100); and entered into force on 7 April 1948.
25.

Activity Online activities on Blackboard such as:

1. Psychological and wellbeing class Exercise
2. Transport and health exercise

Water Distribution and Treatment (CIE424) Course Syllabus

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

CIE 424

Water Distribution and Treatment

Department of Civil Engineering, School of Engineering

Lebanese American University

Fall Semester xxx

Instructor Information

Instructor:	Dr. Mahmoud Wazne
Office Location:	Bassil 301
Telephone:	Office
Office Hours:	xxxx

E-mail: mahmoud.wazne@lau.edu.lb
Website:

Course Identification

Course Number: CIE 424
Course Name: Water Distribution and Treatment
Course Location: Byblos Campus
Class Times: xxxx
Prerequisites: Co-requisite: CIE425 Environmental Engineering - Lab, Pre-requisite CIE 322 Hydraulics, CIE424 is a pre-requisite for CIE 426 Wastewater Collection and Treatment.
Faculty Web Page:

Course Description/Overview

CIE424 Water Distribution and Treatment [3-0, 3cr.] Providing drinking water is integral to the survival and the proper development of all communities. The processes undertaken to ensure the safe and adequate drinking water supplies are covered in this course. The course is comprised mostly of seven sections. In the first section, the parameters used to identify the physical, chemical, and biological qualities of water are discussed along with local and international drinking water standards. Section two covers the methods used to estimate population growth and their use to predict water consumption. In the third section, all water storage and distribution methods are discussed in context of providing safe and adequate potable water to various communities. In section four, information on pipe material and stresses in pipes are provided. Section five covers the physical and chemical treatment of water including screening, coagulation/flocculation, sedimentation, basin design, filtration, and disinfection. In section six, the effects of climate changes on water supply is discussed along with the anticipation of those effects in the water network design. In the final section, environmental and professional ethics issues pertaining to water supply works are discussed with aim to help students make the right decisions.
Pre-requisite: CIE322 Hydraulics.

Course Learning Objectives

3. To provide students with information on water distribution and treatment.
4. To equip students with technical tools needed to design water distribution systems and treatment plants.

Course Content Learning Outcomes

At the conclusion of this course, each student will be able to do the following:

12. Understand the theory and applications for the design of water distribution systems and related appurtenances.
13. Understand methods of distribution and design criteria,
14. Understand the physical, chemical and biological water quality properties and standards;
15. Determine the quantity of water, population estimation; water use factors; fire demand; design periods,
16. Analyse and size the water treatment components: sedimentation; hindered settling; coagulation/flocculation processes; basin design; filtration; disinfection;
17. Learn basic design criteria for each water treatment process as well as to understand how to design each component.
18. Understand the effects of climate change on water supply
19. Understand professional and ethical responsibility.

Course Resources

Course Website(s)

Required Course Texts and Materials

10. **Environmental Engineering, by Peavy, Rowe, Tchobanoglos, McGraw-Hill International Editions (Required)**
11. Water Supply and Sewerage, by Terence J. McGhee sixth edition, McGraw-Hill International Editions.
12. Theory and Practice of Water and Wastewater Treatment, by R.L. Droste, John Wiley and sons.

13. Fundamentals of Hydraulic Engineering, by Alan. A. Prasuhn, Holt, Rinehart and Winston, the Dryden Press, Saunders College Publishing.

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

Grading Policy

Evaluation of the student's final grade in the course will be based on his/her performance throughout the course and will be a combination of the following:

Item	***Percentage***
Homework and/or class assignments	***4***
Two Tests (28 % each)	***56***
Comprehensive Final Exam	***40***

Course Policies

Structure

Lecture	Two 75-minute lectures per week
Laboratory	None

Medium	all material explained in class and on the whiteboard
Tests	2 Tests-90 minutes each - closed book
Final	180 minutes, comprehensive, closed book
H.W.	Several H.W., solution posted after submission
Projects	Design of a system,

Policy

Class Attendance	You are expected to attend all classes and arrive on time. Obtain prior clearance for planned absences and meet with the instructor after any emergency absences. It is the student's responsibility to obtain any class notes and/or homework questions in case of being absent from a lecture.
Academic Integrity	❖ LAU expects all students to maintain the highest level of integrity. Cheating or plagiarism will not be tolerated. University policies regarding academic integrity are available in http://www.lau.edu/policies ❖ The instructor will adhere to all LAU policies regarding academic integrity as stated. ❖ All work must be the result of students' own efforts. ❖ Students who are suspected of plagiarism or other violations of academic integrity codes will face investigation. Those found guilty will face disciplinary action. Repeated offenses will result in permanent expulsion from the University.
Homework Policy	Homework must be neat and legible or it will not be graded, and must be turned in at the beginning of class on the day it is due, with no exceptions.

Exam Policy	Make a consorted effort to be present for each test since there will not be any makeup. A student who misses a test will be given a zero grade unless the student can provide a convincing excuse. With a convincing excuse, either a make-up exam will be given or the other exams will be weighted heavier, at the instructor's discretion.
Exam Dates	❖ **Test 1 is scheduled on xxx.** ❖ **Test 2 is scheduled xxx.** ❖ **Final Exam is scheduled by the Registrar.**
Course Website	Syllabus, solution of homework, solution of tests, solution of previous tests, handouts, and any relevant material are placed on "courses online" at services.sea.lau.edu.lb
Cheating	A students caught cheating on an exam receives a grade of zero on the exam in the first cheating attempt and a warning. A student caught cheating for the second time in the same course receives an F grade in the course and a second warning.
Studying	❖ You need to study on a regular basis after each lecture. Do not postpone studying till just before the tests. ❖ Solve the assigned homework as soon as it is announced in class. To benefit the most from the previous tests, solve it on your own as if it were a real test and then look at the solution. ❖ You are responsible for all the material covered in class. Any material that is in the textbook and not covered in class will not be included in the tests. ❖ Take advantage of my office hours. It is your chance to get individual attention and explanation. ❖ Finally, a well prepared student does not need to study on the night before the exam.

Course Schedule

Topic		
1	***Water quality***	water and impurities; contaminants and pollutants; standards; and physical, chemical, and biological water quality parameters.
2	***Quantity of Water***	relation between quantity and population; population estimation; water use factors; fire demand; and design periods and flows
3	***Water supply and distribution systems***	intakes, methods of distribution, storage, flow estimation, pressures, design of networks, system maintenance, and protection of water quality in systems
4	***Pipes and conveyance systems***	conveyance and distribution, stresses in pipes, pipe material, valves, and other appurtenances
5	***Water Treatment Techniques***	purpose; sedimentation; hindered settling; scour; coagulation/flocculation processes; settling basin design; filtration; disinfection
6	***Effects of climate change on drinking water***	Climate change, effects of climate change on water supplies, anticipate effects of climate change in water supply network design
7	***Ethical / Professional Issues***	professional codes, standards and regulations applicable to environmental Engineering, ethical issues in a project or problem.

Water Distribution and Treatment (CIE424) Course Module

Course	**Water Distribution and Treatment**
Module 1	Water Quality
Key Concepts	Drinking water standards, water pollution, contaminants, water quality parameters
Overview	Topics to be covered in this module include local and international drinking water standards, description of the physical, chemical, and biological parameters used to characterize water quality, contaminates of concern in drinking water, and identification of various pathogens
Aim	The aim of this module is introduce the concepts of drinking water standards and the potential hazards resulting from various contaminants.
Learning Outcomes	At the end of this module students will be able to: • Identify and discuss the different drinking water standards • Identify and discuss the various water parameters used to characterize water quality • Identify and discuss various contaminants and pathogens found in water
Units	Unit 1.1 Drinking water standards Unit 1.2: Water quality parameters Unit 1.3: Water contaminants and pathogens
Readings	Chapter 2: Water quality: Definitions, characteristics, and perspectives (Environmental Engineering, by Peavy, Rowe, Tchobanoglos, McGraw-Hill International Editions). Various Local, EPA and WHO documents on drinking water standards.
Activity	**Overview**

	Compare and contrast various local and international drinking water standards. Solve homework problems pertaining to physical, chemical, and biological qualities of drinking water.
Module 2	Quantity of Water
Key Concepts	Water use factors, population estimation
Overview	In this module student will learn about the various factors controlling the amount of water needed by domestic, commercial, and public sectors. The module will go over the various methods used to estimate population growth and hence the amount of water needed by various communities.
Aim	The aim of this module is to equip the student with the tools needed to predicted the amount of water needed by various communities
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss factors controlling water use by various communities • Predict the amount of water needed by various communities
Units	Unit 2.1: Factors controlling water use Unit 2.2: Population growth estimation methods Unit 2.3: Estimation of water use for various communities
Readings	Chapter 2: Quantity of Water and Sewage (Water Supply and Sewerage, by Terence J. McGhee sixth edition, McGraw-Hill International Editions)
Activity	**Overview**
	Solve homework problems pertaining to population growth and estimation of water needed for various communities

Module 3	Water Supply and Distribution Systems
Key Concepts	Water supply, mass curve, water distribution
Overview	In this module the student will learn about the types of water supply and distribution methods, and the use of mass curves in the design of reservoir storage capacity using water supply and demand data.
Aim	This module aims to provide students with information on the various water distribution methods. Students will also gain the knowledge needed to design reservoirs for various communities using the mass curve and water supply and demand data.
Learning Outcomes	At the end of this module learners will be able to: • Demonstrate knowledge on the principles water distribution and storage • Design reservoirs capacity using the mass curve
Units	Unit 3.1: Methods of water distribution Unit 3.2: Mass curve Unit 3.3: Designing water reservoirs capacities
Readings	Chapter 3: Hydrology (Fundamentals of Hydraulic Engineering, by Alan. A. Prasuhn, Holt, Rinehart and Winston, the Dryden Press, Saunders College Publishing)
Activity	**Overview** Homework problems on water distribution methods and reservoir storage capacity design
Module 4	Pipes and Conveyance Systems
Key Concepts	Conveyance, stresses in pipes, pipe material, valves, appurtenances

Overview	In this module students will learn about the various types of water conveyance systems, pipes and pipe material, pipe fittings, valves, stresses in pipes
Aim	The aim of this module is to provide students with information on the various components of water conveyance systems and stresses in pipes.
Learning Outcomes	At the end of this module learners will be able to: • Demonstrate knowledge on water conveyance systems • Identify and Solve for stress in pipes
Units	Unit 3.1Water conveyance systems Unit 3.2: Stresses in pipes
Readings	Chapter 2: Aqueducts and Water Pipes (Water Supply and Sewerage, by Terence J. McGhee sixth edition, McGraw-Hill International Editions).
Activity	**Overview**
	Solve problems on identifying various water conveyance systems and stresses in pipes.
Module 5	**Water Treatment Techniques**
Key Concepts	Screening, sedimentation, flocculation, filtration, disinfection
Overview	This module will cover important concepts in water treatment techniques such as settling velocity, settling types, flocculation, sedimentation, filtration, screens, flocculator design, disinfection, and head losses in filters
Aim	The aim of this module is to equip students with the tools necessary to design water purification systems.
Learning	At the end of this module learners will be able to do the following:

Outcomes	• Screen design • Design sedimentation basins • Calculate head losses in filters • Design water disinfection systems
Units	Unit 5.1: Screens Unit 5.2: Sedimentation basins Unit 5.2: Filtration Unit 5.2: Disinfection
Readings	Chapter 11: Screening and Sedimentation. Chapter 13: Coagulation and Flocculation. Chapter 14: Filtration. Chapter 16: Disinfection (Theory and Practice of Water and Wastewater Treatment, by R.L. Droste, John Wiley and Sons).
Activity	**Overview**
	Solve design problems on screening, flocculation, sedimentation, filtration, and disinfection.
Module 6	**Effects of Climate Change on Drinking Water**
Key Concepts	Climate change, drought, soil erosion, eutrophication
Overview	Students in this module will learn about climate change and the effects of climate change on drinking water supply. Climate change is expected to lead to extreme weather patterns such as extended droughts or floods. Both of these patterns are expected to have detrimental effects on water supply. Floods may lead to soil erosion and surface runoff leading to increased discharge of fertilizers in lakes and rivers, which could lead to

	eutrophication whereas extended droughts could lead to increased stress on infrastructure. Extreme weather patterns could also make historical water data unreliable. In addition, extreme weather patterns may lead to population shift and increase or decrease in customer base.
Aim	The aim of this module is to introduce students to climate change and the effects of climate change on drinking water supply.
Learning Outcomes	At the end of this module students will: • Be able to show the effects of climate change on drinking water supply • Anticipate climate change effects in the design of water supply networks.
Units	Unit 6.1: Climate change Unit 6.2: Effects of climate change on water supply Unit 6.3: Anticipating the effects of climate change in the design of water supply networks.
Readings	A compilation of hands-out
Activity	**Overview**
	Individual or group student presentations on climate change and the effects of climate change on drinking water supplies.
Module 7	**Ethical and Professional Issues**
Key Concepts	Environmental justice, professional ethics
Overview	This module is a collection of seminar type presentations which will go over series of case studies addressing professional codes, standards and regulations applicable to environmental engineering, and ethical issues in work projects.
Aim	The aim of this module is to help students understand the ethical issues encountered in the work place and how to formulate the right decision.
Learning Outcomes	At the end of this module learners will be able to: • Apply knowledge of environmental and ethical issues in work related

	decisions
Units	Unit 6.1: Environmental justice Unit 6.2: Professional ethics
Readings	A compilation of hands-out
Activity	**Overview**
	Individual or group student presentations on environmental justice and professional ethics.

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

CIE 426

Wastewater Collection and Treatment
Department of Civil Engineering, School of Engineering
Lebanese American University
Fall Semester 2014

Instructor Information

Instructor:	Dr. Jean Chatila
Office Location:	Bassil 309
Telephone:	Office
Office Hours:	M 11:00– 12:00 T 14:00 – 15:30
E-mail:	jchatila@lau.edu.lb
Website:	

Course Identification

Course Number:	CIE 426
Course Name:	Wastewater Collection and Treatment
Course Location:	Byblos Campus
Class Times:	T Th 09:30 – 11:00 T Th 11:00 – 12:30
Prerequisites:	Co-requisite: CIE427 Environmental Engineering – SOFT, Pre-requisite CIE 424 Water Distribution and Treatment.
Faculty Web Page:	

Course Description/Overview

CIE426 Wastewater Collection and Treatment [3-0, 3 cr.] Design of sanitary and storm sewers and related appurtenances, mass balances and hydraulic flow regimes; reaction order and rates, analysis of experimental data, attached and suspended growth biological wastewater treatment systems including: activated sludge and its variations, aerated lagoons, SBR, trickling filters, RBC; basic nitrification-denitrification processes; oxygen requirements; introduction to sludge treatment and disposal. Pre-requisite: CIE 424 Water Distribution and Treatment

Course Learning Objectives

- To enable students recognize the importance of wastewater treatment in relation to health and environmental protection and to realize the impact that such an activity will have on the socio-economic status of the community.
- To provide the students with sufficient scientific and technological knowledge and familiarity of the commonly used physical, chemical, and biological wastewater treatment unit processes; and to substantiate this knowledge with engineering problem solving.
- To train students to synthesize the information learnt on unit processes into a global process that would lead to achieving the required end product as a real life application

Course Content Learning Outcomes

At the conclusion of this course, each student will be able to do the following:

20. Describe the general considerations of sewerage
21. Perform preliminary design of a wastewater collection system and storm water system.
22. Determine classes and types of reactions, rates and order and analyze experimental data
23. Apply mass balance principles to tanks and reactors with plug and completely mix flow regimes
24. Perform treatment of carbonaceous and nitrogenous organic matter
25. Size and analyse an activated sludge treatment unit

26. Size and analyse a trickling filter
27. Size and analyse a RBC treatment unit
28. Analyse the oxygen sag curve and determine pollutant concentration in an open channel.
29. Define climate change and describe its impact on wastewater treatment.

Course Resources

Course Website(s)

Required Course Texts and Materials

14. Theory and Practice of Water and Wastewater Treatment, by R.L. Droste, John Wiley and sons (Required).
15. Wastewater Engineering, by Metcalfe and Eddy, third edition, McGraw Hill.
16. Environmental Engineering, by Peavy, Rowe, Tchobanoglos, McGraw-Hill International Editions.
17. Water Supply and Sewerage, by Terence J. McGhee sixth edition, McGraw-Hill International Editions.
18. Fundamentals of Hydraulic Engineering, by Alan. A. Prasuhn, Holt, Rinehart and Winston, the Dryden Press, Saunders College Publishing

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

Grading Policy

Evaluation of the student's final grade in the course will be based on his/her performance throughout the course and will be a combination of the following:

Item	*Percentage*
Homework and/or class assignments	***2***
Term paper or project	***4***
Two Tests (27 % each)	***54***
Comprehensive Final Exam	***40***

Course Policies

Structure

	Description
Lecture	Three 50-minute lectures per week
Laboratory	None
Medium	all material explained in class and on the whiteboard

Tests	2 Tests-90 minutes each - closed book
Final	180 minutes, comprehensive, closed book
H.W.	Several H.W., solution posted after submission
Projects	(1) Design of a system,

Policy

Class Attendance	You are expected to attend all classes and arrive on time. Obtain prior clearance for planned absences and meet with the instructor after any emergency absences. It is the student's responsibility to obtain any class notes and/or homework questions in case of being absent from a lecture.
Academic Integrity	❖ LAU expects all students to maintain the highest level of integrity. Cheating or plagiarism will not be tolerated. University policies regarding academic integrity are available in http://www.lau.edu/policies ❖ The instructor will adhere to all LAU policies regarding academic integrity as stated. ❖ All work must be the result of students' own efforts. ❖ Students who are suspected of plagiarism or other violations of academic integrity codes will face investigation. Those found guilty will face disciplinary action. Repeated offenses will result in permanent expulsion from the University.
Homework Policy	Homework must be neat and legible or it will not be graded, and must be turned in at the beginning of class on the day it is due, with no exceptions.
Exam Policy	Make a consorted effort to be present for each test since there will not

	be any makeup. A student who misses a test will be given a zero grade unless the student can provide a convincing excuse. With a convincing excuse, either a make-up exam will be given or the other exams will be weighted heavier, at the instructor's discretion.
Exam Dates	❖ **Test 1 is scheduled on …., 2014.** ❖ **Test 2 is scheduled on …….., 2014.** ❖ **Project is due on Wednesday ……, 2014.** ❖ **Soft and hard copies should be submitted.** ❖ **Exam dates may be rescheduled upon the instructor's discretion**
Course Website	Syllabus, solution of homework, solution of tests, solution of previous tests, hand-outs, and any relevant material are placed on "courses online" at **services.sea.lau.edu.lb**
Cheating	A students caught cheating on an exam receives a grade of zero on the exam in the first cheating attempt and a warning. A student caught cheating for the second time in the same course receives an F grade in the course and a second warning.
Studying	❖ You need to study on a regular basis after each lecture. Do not postpone studying till just before the tests. ❖ Solve the assigned homework as soon as it is announced in class. To benefit the most from the previous tests, solve it on your own as if it were a real test and then look at the solution. ❖ You are responsible for all the material covered in class. Any material that is in the textbook and not covered in class will not be included in the tests. ❖ Take advantage of my office hours. It is your chance to get individual attention and explanation. ❖ Finally, a well prepared student does not need to study on the night before the exam.

Course Schedule

Topic	
1	General Considerations of Sewerage: sources of sewage; flow fluctuation; design periods; guidelines and standards; characteristics of sewage.
2	Hydraulic Design of Sewer Systems: Preliminary investigations, design requirements and principles, sanitary sewer design, storm sewer design.
3	Reaction Kinetics: Chemical concepts of stoichiometry, chemical equilibria, bacterial growth and decay, classes and types of reactions, rates and order, analysis of experimental data, and applications.
4	Mass Balances and Hydraulic Flow Regimes: Setup of mass balances, flow analysis of CM and PF reactors, and system material balances.
5	Wastewater Treatment Systems: preliminary; primary; secondary and tertiary treatment processes; design of biological treatment units with special emphasis on aerobic biological treatment: • Suspended growth: activated sludge processes and its variations; process analysis, completely mixed vs. plug flow activated sludge treatment. • Attached growth: analysis and design of fixed film processes such as trickling filters and rotating biological contactors
6	Sludge production and treatment: brief introduction to sludge treatment methods and dewatering,
7	Nitrogen and Phosphorous Treatment design process for nitrogen and phosphorus removal, oxygen uptake.

8	Effluent Disposal in Natural Waters: dissolved oxygen variation in a stream (oxygen sag curve)
9	Contemporary Issue in Environmental Engineering and impact of engineering solutions in a global, economic, environmental, and societal context.

Course Modules

Course	Environmental Sciences
Module 1	General Considerations of Sewage and its Collection
Key Concepts	Sewage and the Collection Systems
Overview	In this module, the student will be introduced to general considerations of sewerage: sources of sewage; flow fluctuation; design periods; guidelines and standards; characteristics of sewage including the Biochemical oxygen Demand, Chemical Oxygen Demand and other parameters. Discussions will include methods of measuring these parameters and their impact on the environment and the treatment processes. Analysis of experimental data to obtain the ultimate BOD and the rate constant will be presented using different methods. Furthermore, the students will be presented with the hydraulic design of sewer systems: preliminary investigations, design requirements and principles, sanitary sewer design, storm sewer design. It is well noted that with climate

	change the precipitation intensity will be more and as a result combined sewers will be flooded more frequently. Designs shall account for climate change.
Aim	The overriding aim of this module is to make the students able to discuss the general considerations of sewage and the collection systems along with the impact of climate change on designs.
Learning Outcomes	At the end of this module learners will be able to: • Describe the general considerations of sewerage • Perform preliminary design of a wastewater collection system and storm water system.
Units	Unit …. Bio-Chemical parameters Unit …..: Collection systems
Readings	• Water Quality, by George Tchobanoglous and Edward Schroeder, Alison Wesley, • Theory and Practice of Water and Wastewater Treatment, by R.L. Droste, John Wiley and sons (Required). • Wastewater Engineering, by Metcalfe and Eddy, third edition, McGraw Hill. • Environmental Engineering, by Peavy, Rowe, Tchobanoglos, McGraw-Hill International Editions. • Water Supply and Sewerage, by Terence J. McGhee sixth edition, McGraw-Hill International Editions. • Fundamentals of Hydraulic Engineering, by Alan. A. Prasuhn, Holt, Rinehart and Winston, the Dryden Press, Saunders College Publishing
Activity	**Overview**
	Assignment: • Analysis of experimental data using Thomas, Least Squares, and Fujimoto Methods. • Design of a sample sewer network taking into consideration many

	constraints and parameters. Graded questions in test 1 and possibly in the final Exam.
Module 2	**Reaction Kinetics and Materials Balances**
Key Concepts	Reaction Kinetics and Mass Balances
Overview	Development of water quality models involves the coupling of concepts from biological and chemical reaction kinetics and stoichiometry with material balances and known physical constraints to provide useful predictive model. In this module, the students will be introduced to reaction kinetics: chemical concepts of stoichiometry, chemical equilibria, bacterial growth and decay, classes and types of reactions, rates and order, analysis of experimental data, and applications. Furthermore, the students will be introduced to the importance and application of mass Balances and hydraulic flow regimes: setup of mass balances, flow analysis of CM and PF reactors, and system material balances. Applications include hydrologic systems, fluid mechanics systems, as well as wastewater biological related applications. It is well known that climate change has an impact on temperature. In this module, the effect of temperature on reaction rate constants will be addressed. The rate of reaction will increase with an increase in temperature, which affects the treatment process.
Aim	The overriding aim of this module is to understand the reaction kinetics and apply material balances with stressing the impact of climate change and rise in temperature on the reaction rates.
Learning	Students will be able to:

Outcomes	• Determine classes and types of reactions, rates and order and analyse experimental data • Apply mass balance principles to tanks and reactors with plug and completely mix flow regimes
Units	Unit …. Reaction kinetics Unit …. Mass balances Unit …. Climate change impact
Readings	• Water Quality, by George Tchobanoglous and Edward Schroeder, Alison Wesley. Chapter 5 • Theory and Practice of Water and Wastewater Treatment, by R.L. Droste, John Wiley and sons. Chapter 10.
Activity	**Overview**
	Assignment: • Determine reaction kinetics for different types of reactions. Examples in Chapter 5 5.3 to 5.12 in Water Quality. • Write mass balances and apply then for different situation. Examples in Chapter 5 5.18 to 5.22 Water Quality. • Assessing flow regimes and their differences, Examples in Chapter 6 Water Quality, 6.8, 6.9, 6.10, and 6.13. Graded questions in test 1 and possibly in the final Exam.
Module 3	**Wastewater Treatment Systems**
Key Concepts	Biological treatment
Overview	Microbial cultures are the active agents for removing impurities from wastewater in biological treatment processes. Using micro-organisms to modify water quality under controlled circumstances requires a somewhat different emphasis. The engineer has a number of decisions to make with respect to process configuration. The most important selection relates to the

	volume and reaction rates and kinetics. Furthermore, the effluents produced by biological treatment are not suitable for potable use, and thus economic utilization of biological treatment is limited to wastewater. In this module, the student is exposed to wastewater treatment systems: preliminary; primary; secondary and tertiary treatment processes; design of biological treatment units with special emphasis on aerobic biological treatment: • Suspended growth: activated sludge processes and its variations; process analysis, completely mixed vs. plug flow activated sludge treatment. • Attached growth: analysis and design of fixed film processes such as trickling filters and rotating biological contactors • Sludge production and treatment will be introduced briefly along with sludge dewatering. Furthermore, Nitrogen and Phosphorous Treatment design process for nitrogen and phosphorus removal will be emphasized along with the oxygen uptake and the production of gases. This will be addressed from a climate change point of view and their impact on the environment. .
Aim	This module aims at examining the different biological wastewater treatment systems along with presenting the impact of varying parameters and specifically that result from climate change.
Learning Outcomes	At the end of this module learners will be able to: • Perform treatment of carbonaceous and nitrogenous organic matter • Size and analyse an activated sludge treatment unit • Size and analyse a trickling filter • Size and analyse a RBC treatment unit • Discuss briefly sludge treatment

Units	Unit ….: Attached growth *Unit ….: Suspended growth* Unit ….: Impact of parameters on treatment
Readings	• Water Quality, by George Tchobanoglous and Edward Schroeder, Alison Wesley. Chapter 14 • Theory and Practice of Water and Wastewater Treatment, by R.L. Droste, John Wiley and sons. Chapter 17.
Activity	**Overview**
	Assignment: • Analyse treatment systems and effect of parameter variation on performance. Examples in Chapter 14 in Water Quality and Examples from Theory and Practice of Water and Wastewater Treatment Chapter 17 3 thru 7, 22, 23, 24, 36. Graded questions in test 2 and possibly in the final Exam.
Key Concepts	Oxygen sag curve and pollutant concentration in an open channel.
Overview	A major aspect of water quality management involves modelling water quality changes in streams and rivers subject to inputs. The development of water quality models involves the application of mass balances and kinetic expressions to describe the response of the systems. It is important to assess the assimilative capacity of these systems, and thus predict the impact of the proposed developments and natural occurrences. In summary, this module introduces the student to these concepts in line with climate change impacts and consequences. The student will learn how to analyse the oxygen sag curve and determine pollutant concentration in an open channel.
Aim	The overriding aim of this module is the ability to analyse the oxygen sag curve

	and determine pollutant concentration in an open channel.
Learning Outcomes	At the end of this module learners will be able to: • Analyse the oxygen sag curve and determine pollutant concentration in an open channel. • Explore the effect of climate change in the sense of rising temperature on these applications.
Units	Unit …….: Water quality and Climate Change Unit …..: Natural resources deterioration
Readings	• Water Quality, by George Tchobanoglous and Edward Schroeder, Alison Wesley. Chapter 8
Activity	**Overview**
	Assignment: Analyse the oxygen sag curve, Examples in Chapter 8 Water Quality, 8.2, 8.3, 8.4 Graded questions in test 2 and possibly in the final Exam.
Key Concepts	Contemporary Issue in Environmental Engineering and impact of engineering solutions in a global, economic, environmental, and societal context.
Overview	Climate change is expected to result in increasing the temperature as well as changes in frequency and timing of precipitation events. As a result, more raw sewage will be dumped into receiving bodies of water. Minor temperature changes can have significant effects on biological reactions. Also, activated sludge aeration systems operating at high temperatures support nitrification. Many gases evolve from wastewater treatment that contribute to the green house affect. As climate change is a major concern, alternatives should reduce both greenhouse gas emissions and power consumption, making anaerobic treatment a more attractive component of novel approaches to treatment processes.

	LCA has emerged as the standard for quantifying the environmental impacts of a particular product or process. The goal of LCA is to account for the full range of environmental impacts attributable to processes. The term "life cycle" requires cradle-to-grave assessment, including raw material, production, manufacture, distribution, use and disposal. LCA is a useful decision making tool to develop holistic environmental impacts.
Aim	The overriding aim of this module is to equip students with the ability to discuss capacity to debate on water management and recycling processes, techniques and feasibility.
Learning Outcomes	At the end of this module learners will be able to: • Quantify the environmental impact of a wastewater treatment plan • Assess environmental impacts of various supplemental carbon alternatives • Assess the impacts to human health, ecosystem quality, and resources
Units	Unit ….. Wastewater treatment and climate change Unit …. Impact of engineering solutions on the environment
Readings	• *EPA documents www.epa.gov*
Activity	**Overview** • Students will be asked to prepare a report on the impact of climate change on wastewater treatment as well as the impact of wastewater treatment on climate change. • Furthermore, questions will be asked in the final exam related to this course module. • Term project: Impact of climate change on wastewater treatment.

APENDIX I: Environmental Engineering SOFT Course Syllabus

Environmental Engineering SOFT

Course Syllabus

Course Number:

Instructor Information

Instructor: Mr. Karim Khoury
Office Location:
Telephone:
Office Hours:
E-mail: karim.elkhoury@lau.edu.lb
Website:

Course Identification

Course Number: CIE427
Course Name: Environmental Engineering SOFT
Course Location: Byblos

Class Times:

Prerequisites: CIE426 Co

Faculty Web Page:

Course Description/Overview

Analysis and design using commercially available software: wastewater treatment plant; sizing of tanks; effluent concentration. Results visualizations and assessment: cost analysis, operation and maintenance. The following topics will be covered (not necessarily in sequential order) and contingent upon the student progress:

1- Introduction to wastewater treatment
2- Pricing and cost estimation of wastewater treatment schemes
3- Treatment of carbonaceous organic matter
4- Treatment of nutrients like nitrogen and phosphorous
5- Budding models
6- Simulation techniques
7- Editing layouts and using scenarios
8- Influent data and influent advisor
9- The define function
10- Sensitivity analysis
11- Examples of actual plans (case studies: A2O model, Bardenpho model, …)

Course Learning Objectives

The overarching goals of this course are: a) Design a civil engineering component/ system by applying standards appropriate for design including codes and regulations and incorporating multiple constraints into the design in the civil engineering areas of environmental engineering. b) Identify problem setting and related assumptions, limitations and solution requirements in the environmental engineering field. c) Formulate methods and strategies considering all relevant perspectives, solution models, and alternative solution paths. d) Use selected models, methods, and data to produce the appropriate solution. e) Use industry standard software to analyse and design engineering components.

Course Content Learning Outcomes

At the end of this course, each student will be able to do the following:

1- Build a layout and create a model for a wastewater treatment plan and assign appropriate process models and parameter values.
2- Perform cost analysis for different plant layouts and understand the impact of design criteria on costs.
3- Compile the objects into a plant model, apply simulation techniques, edit layouts, evaluate scenarios and use influent data and advisor.
4- Perform treatment of carbonaceous organic matter.
5- Perform treatment of nutrients like nitrogen and phosphorous.
6- Perform sensitivity analysis.
7- Apply the software for case studies.
8- Perform a preliminary design of the most widely used wastewater treatment unit operations and organize them into a functioning treatment system.
9- Evaluate different approaches to wastewater treatment and select the best option for local conditions.

Course Resources

Course Website(s)

Required Course Texts and Materials

- Theory and practice of water and wastewater treatment, by R.L. Droste, John Wiley and sons.
- Wastewater engineering, by Metcalfe and Eddy, third edition, McGraw Hill.
- All notes, lectures and textbooks assigned or provided by Dr. Jean Chatila for the Environmental Engineering II course.

- Hand-outs prepared for students and distributed with each session

Optional Course Texts and Materials

1. GPS-X User's Guide, GPS-X version 6.1.
2. GPS-X Tutorial Guide: A STEP-BY-STEP GUIDE FOR LEARNING AND GETTING FAMILIAR WITH GPS-X, GPS-X version 6.2

Assignments and Grading Scheme

Grading System

0 to 100 (where 70 is the least pass mark)

Grading Policy

Grades can be based on the following:

Homework / Class assignment / Participation	20
Design project	10
Two tests (20% each)	40
Comprehensive final exam	30
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

Class	You are expected to attend all classes and arrive on time. Obtain

attendance	prior excuse for planned absences and meet with the instructor after any emergency absences. It is the students responsibility to obtain any class notes and / or homework questions in case of being absent from a lecture
Academic integrity	• LAU expects all students to maintain the highest level of integrity. Cheating or plagiarism will not be tolerated. University politics regarding academic integrity are available in http://www.lau.edu.lb/governance-policies/policies/ . • The instructor will adhere to all LAU policies regarding academic integrity as stated • All work must be the result of students own efforts • Students who are suspected of plagiarism or other violations of academic integrity code will face investigation. Those found guilty will face disciplinary action repeated offenses will result in permanent expulsion from the university.
Homework policy	Homework must be neat and legible or it will not be graded and must be turned in at the beginning of class on the day it is due with no exceptions
Exam policy	Make an effort to be present for each test since there will not be any makeup tests. A student who misses a test will be given a zero grade unless the student can provide a convincing excuse.
Exam dates	• Test 1 date is TBA • Test 2 date is TBA • Project will be announced with a two weeks deadline • Soft and hard copies should be submitted

	• Exam dates may be rescheduled upon the instructor's direction
Course website	Syllabus, solution of homework, solution of tests, solution of previous tests, hand-outs, and any relevant material are placed on "courses online" at services, services.sea.lau.edu.lb
Cheating	Students caught cheating on an exam will receive a grade of zero on the exam in the first cheating attempt and a warning. Students caught cheating for the second time in the same course will receive an F grade in the course and a second warning.
Studying	• You need to study on a regular basis (after each lecture) do not postpone studying till just before the tests • Solve the assigned homework as soon as it is announced in class. To benefit the most from the previous tests, solve it on your own as if it were a real test and then look at the solution. • You are responsible for all the material covered in class. Any material that is in the textbook and not covered in class will not be included in the tests. • Take advantage of my office hours. It is your chance to get individual attention and explanation. • Finally, a well prepared student does not need to study on the night before the exam.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines (Details on assignments and more bibliography are available in the course modules)
1		CapdetWorks basic waste water treatment plant layout. Editing parameters. Cost parameters
2		CapdetWorks advanced database modification. Cost override. Design override. Comparing several layouts. Sensitivity analysis. Generating a report
3		GPSX - Basic modelling. Introduction to simulation interface. Outputs and results.
4		GPSX - Creating scenarios
5		GPSX - Data input and output
6		GPSX - Automatic controllers and tuning
7		Test 1
8		GPSX - Define function
9		GPSX - Sensitivity analysis
10		GPSX - Monte Carlo analysis and probability analysis
11		GPSX – Case study : Nutrients removal : Phosphorus removal

12		GPSX – Case study : Nutrients removal : Nitrogen removal
13		Test 2
14		Review of GPSX and comparison of treatment alternatives (A2O model, Bardenpho model, CMAS with post-anoxic treatment.
15		Final exam

APENDIX II: The CLIMASP Course Modules Template Example

Course	Curriculum and Hypermedia
Module 1	Wastewater treatment plant: General overview
Key Concepts	Wastewater treatment, sludge treatment, preliminary, primary, secondary and tertiary treatments.
Overview	The students are introduced to wastewater treatment plants. A basic introduction to treatment stages: First of all an overview of preliminary treatment such screens, grit removal, equalization tank. Then primary treatment is introduced, clarification is explained. Furthermore, secondary treatments are

	explained: biological treatments (suspended growth and attached growth) along with main concepts of wasted activated sludge (WAS) and recycled activated sludge (RAS) when required. Concept of bacterial activity is introduced. Also, tertiary treatments are introduced: chlorination, filtration, UV treatment. Then sludge treatment is also introduced (anaerobic and aerobic digestion, sludge thickening, sludge drying, filter-press belts …) along with water return cycles into the treatment chain. Sludge re-use is also discussed, and students appreciate benefits of the treatment: sludge cakes, gas extraction, energy production, ecological landfill.
Aim	The aim of this module is to allow students to have a complete perspective of treatment plans and their benefits. How to create sustainable system that will provide adequate cleansing of wastewater while converting it to two needed assets: water and reusable sludge.
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss the different types and functions of treatment units • Discuss how wastewater treatment is a sustainable practice
Units	Unit 1.1: Wastewater treatment units Unit 1.2: Wastewater treatment chain Unit 1.3: Sludge Treatment chain Unit 1.4: Benefits of wastewater treatment
Readings	• Theory and practice of water and wastewater treatment, by R.L. Droste, John Wiley and sons. • Handouts provided for topic 1

Activity	**Overview** Assignment 1: Creating a complete wastewater treatment plant 1. Students are required to draw a fully functional treatment plant. 2. Students' knowledge and understanding of all treatment stages is evaluated through a comprehensive questionnaire. Tests 1 and 2 1. In both tests the students are required to draw and analysis treatment plants within specific case studies. Project 1. The students will work with a team to design of fully functional treatment plants within design guides and effluent targets meeting international standards.
Module 2	Costing of WWTP using CapdetWorks
Key Concepts	Running cost, fixed costs, optimization, economical criterion, sensitivity analysis, CapdetWorks
Overview	This module introduces the students to a basic pillar of sustainable development: The economical factor. For any process to be sustainable an economic analysis should take place and the project cost must always be optimized. The students will be exposed to project costs including but not limited to: building, concrete works, land, electricity, labor, chemical, managerial, equipment and technical costs. This concept is introduced through CapdetWorks software. The module also exposes the students to running costs: Operation, maintenance, material, chemical, energy, and amortization costs. Discussions of breakeven points in decision making policies. Energy-intensive systems, chemically dependent treatments, sustainability, etc… are concepts that will be integrated within this module which will allow the student to understand concepts beyond the treatment plant itself giving them a broader

	insight on the topic. The student will learn how to change parameters, both design and cost. Also the students will learn how to override a design or even a cost. Sensitivity analysis is performed in order to evaluate the effect of a design factor, or cost factor on the entire plant cost. Local and global variables are assessed that will yield changes of costs for the entire process and/or the particular unit.
Aim	The overriding aim of this module is to broaden the scope of environmental studies and integrate sustainability decision making tools such a costing
Learning Outcomes	At the end of this module learners will be able to: • Perform a costing analysis for various WWTP layouts • Understand the difference between fixed and running costs • Be able to compare several treatment schemes and evaluate the costs • Perform sensitivity analysis
Units	Unit 2.1: Drawing a WWTP and changing parameters Unit 2.2: Fixed and running costs Unit 2.3: Sensitivity analysis
Readings	• Handouts provided for topic 2

Activity	**Overview** Assignment 2.1: application using CAPDETWORKS version 2.5 of Hydromantis Inc. 1. Draw a WWTP having the following units: An influent wastewater, a preliminary treatment, a rectangular primary clarification, a plug flow activated sludge, and a UV disinfection unit. 2. Add an anaerobic digestion unit for the sludge followed by a belt-filter press unit which is connected to a hauling and land filling disposal unit. Make all necessary connections. 3. Edit the parameters as given. Assignment 2.2: advanced application using CAPDETWORKS version 2.5 of Hydromantis Inc. 1. Overriding design, safety factors and cost parameters. 2. Run sensitivity analysis and compare several layouts. 3. Run a cost analysis and note the project initial cost and the running cost by summing all 6 running costs (given in $/year). Test 1 1. In test 1 the students are required to draw and analysis a treatment plant using CapdetWorks software.
Module 3	Suspended and attached growth processes
Key Concepts	Secondary treatment, attached growth, suspended growth, biological treatment.
Overview	The students will be exposed to various secondary treatment solutions and differentiation between attached and suspended growth will be thoroughly explained. In attached growth systems, the students will look at rotating biological contactors and trickling filters. The concept of bacterial growth over a fixed medium will be discussed and modelled.

	In suspended growth systems, students will evaluate completely mix activated sludge, anoxic tank, plug flow tank, and lagoons. Student will appreciate the need to a return activate sludge flow into the system (RAS). Automatic controllers are introduced, such as controls for Dissolved Oxygen (DO) and controlling MLSS levels by regulating the wasted activated sludge flows (WAS). Students will learn how to tune a controlled to obtain realistic responses. Wastewater effluent quality will be assessed and mass flow equilibrium thoroughly discussed. The effect of flow fluctuation over the overall performance is carefully studied and the students will be able to create several data input scenarios which will simulate real-life fluctuations. Varying concentrations of BOD, COD, TKN, phosphorus are implemented into the system within the influent advisor interface. Flow fluctuation is also assessed to evaluate the response of the system. Students will learn how to obtain relevant data to compute SRT and compare it with software results. This module will introduce students to GPS-X: Creating models, controlling inputs and outputs, defining variables, creating controllers and tuning them.
Aim	This module aims at examining the relationship between influent parameters and secondary system responses.
Learning Outcomes	At the end of this module learners will be able to: • Differentiate between several secondary treatment systems • Model a realistic WWTP using GPS-X and use all of its analytical features • Understand the difference between attached and suspended growth
Units	Unit 3.1: GPS-X modelling a WWTP and running a simulation Unit 3.2: Scenarios and influent advisor interface

	Unit 3.3: Automatic controllers and tuning Unit 3.4: Define function, mass flows and SRT
Readings	• Theory and practice of water and wastewater treatment, by R.L. Droste, John Wiley and sons. • Wastewater engineering, by Metcalfe and Eddy, third edition, McGraw Hill. • All notes, lectures and textbooks assigned or provided by Dr. Jean Chatila for the Environmental Engineering II course. • Hand-outs prepared for students and distributed with each session • GPS-X User's Guide, GPS-X version 6.1. • GPS-X Tutorial Guide: A STEP-BY-STEP GUIDE FOR LEARNING AND GETTING FAMILIAR WITH GPS-X, GPS-X version 6.
Activity	**Overview** Assignment 3.1: Basic application using GPS-X version 6.2 of Hydromantis Inc 1. Design a wastewater treatment plant for 8,500 people to treat wastewater for carbonaceous BOD removal. Assume daily sewage flows (L per capita). The treated effluent shall meet the Lebanese standards for suspended solids and BOD limits. 2. The treatment process should confirm to biological extended aeration activated sludge plug flow system. 3. Calculate SRT by hand using output from the software Assignment 3.2: Basic application using GPS-X version 6.2 of Hydromantis Inc 1. Analyse / Design a wastewater treatment plant to treat

	wastewater with a flow rate of 19700 m3/d. 2. The treatment process should confirm to biological extended aeration activated sludge plug flow system. 3. Create scenarios for fluctuations Assignment 3.3: Basic application using GPS-X version 6.2 of Hydromantis Inc 1. Create a wastewater treatment plant with a primary clarifier, followed by a secondary treatment (completely mixed activated sludge) and finally a tertiary treatment for disinfection. Make all proper connections and labelling. 2. In this scenario, you will test the effect of a changing flow with varying concentrations on the outflow concentrations. Assignment 3.4: Advanced application using GPS-X version 6.2 of Hydromantis Inc 1. Create a wastewater treatment plant consisting of a secondary treatment (Plug flow activated sludge). Make all proper connections and labelling. 2. After applying all required steps, add to the report the basic steps required to obtain adequate PID parameters for tuning WAS. Report the obtained PID factors 3. Flow, WAS and MLSS fluctuations for a 50 day steady state analysis with a simulation of dynamic flow (by manually changing the flow from the controls while simulation is ongoing). Comment of the adequacy of the tuned controller 4. The fluctuations of DO in each reactor Assignment 3.5: Advanced application using GPS-X version 6.2 of Hydromantis Inc 1. Create a fictitious wastewater treatment plant consisting of a sinusoidal influent of 10000 m3/day divided into three equal

	flows: The first flow undergoes a secondary treatment with a CMAS with corresponding secondary clarifier. The second is exactly the same with a PFAS instead. And the third is similar with a trickling filter system. The effluents are combined from all three secondary tanks into one effluent. The WAS are also combined into one final WAS. 2. Define "Carbonaceous BOD5" mass flows for the main influent, all three secondary effluents (separately) and the final effluent. Draw a graph showing a 10 day simulation 3. Define "Carbonaceous BOD5" mass flows for the main influent, all three secondary effluents (separately) and the final effluent. Draw a graph showing a 10 day simulation 4. For the first train (CMAS) define a function that will calculate the required WAS for a SRT of 8 days Test 2 1. In test 2 the students are required to draw and analysis a treatment plant using GPS-X software. 2. Capacity to use all software features and analysis results is tested Final Exam 1. In the final exam the students are required to model a complete treatment plant using GPS-X software. 2. Capacity to use all software features and analysis results is tested Project The students will work with a team to design of fully functional treatment plants using GPS-X within design guides and effluent targets meeting international standards.
Module 4	Analysis tools: Sensitivity analysis and Monte Carlo analysis

Key Concepts	Sensitivity analysis, Monte Carlo analysis, probability, steady analysis, dynamic analysis
Overview	This module will allow student to explore further design tools provided by GPS-X. Sensitivity analysis will be explained: Steady state, phase dynamic and time dynamic analysis will be performed. Student will evaluate the effect of one changing parameter on another. This will provide real life decision making tools, such as sizing a clarifier in the most optimal manner to obtain a targeted removal of TSS or BOD. The student will appreciate the difference between many analysis methods. Monte-Carlo analysis will help the student asses the performance of the plant within uncertainty in design parameters. Bacterial growth in suspended growth system has a normal distribution, which will affect the effluent quality. Also beta factor for air diffusion in CMAS reactors will affect oxygenation and thus treatment, the distribution of this factor is uniform. The student will be able to integrate such parameters within the analysis and test the optimality and resilience of their plant. The student will appreciate graphically such distributions and their effects on related outputs.
Aim	The aim of this module is to allow the students to explore further features of GPS-X and use them for design or decision-making purposes.
Learning Outcomes	At the end of this module learners will be able to: • Perform a sensitivity analysis using GPS-X • Perform a Monte-Carlo analysis using GPS-X
Units	Unit 4.1: Sensitivity analysis Unit 4.2: Monte Carlo analysis
Readings	• Hand-outs prepared for students and distributed with each session • GPS-X User's Guide, GPS-X version 6.1.

	• GPS-X Tutorial Guide: A STEP-BY-STEP GUIDE FOR LEARNING AND GETTING FAMILIAR WITH GPS-X, GPS-X version 6.
Activity	**Overview** Assignment 4.1: Advanced application using GPS-X version 6.2 of Hydromantis Inc 1. Run a steady state analysis that would asses an increasing influent flow from 2000m3/day to 10000m3/day with an increment of Δ=200 2. Show results in 4 graphs a. "Primary clarifier" : TSS before and after the primary clarifier b. "Secondary clarifier" : BOD5 before and after the secondary clarifier c. "CM tank " : DO in tank d. "TSS mass flows + ID number": TSS mass flows before and after combiner before entering dewatering unit 3. Run a similar analysis with a time dynamic analysis for 1 day with only 2 runs displayed Assignment 4.2: Advanced application using GPS-X version 6.2 of Hydromantis Inc 1. Create a wastewater treatment plant that has a dysfunctional splitter. While you aim to continuously split the flow into two equal flows, your site engineer reported that the split fraction is ranging between 0.2 and 0.7 with a standard deviation of 0.05 and a mean value of 0.45 (normal distribution). Adding to this, because of maintenance in your equalization tank, the flow is also varying between 4500m3/day and 6000m3/day uniformly. 2. In a new tab, create graphs showing the BOD and free and ionized ammonia final effluent. If the acceptable limit is 20 mg/L for both,

	what's the percentage of the plant failing the BOD requirement? How about the ammonia requirement? Test 2 1. In test 2 the students are required to perform sensitivity and Monte-Carlo analysis Final Exam 1. In the final exam the students are required to perform sensitivity and Monte-Carlo analysis 2. Capacity to use all software features and analysis results is tested Project The students will work with a team to design of fully functional treatment plants using GPS-X within design guides and effluent targets meeting international standards. Design will require the use of advanced design tools.
Module 5	**Nutrient removal processes**
Key Concepts	A2O, Bardenpho process, phosphorus removal, nitrogen removal, chemical removal, biological removal
Overview	This module will discuss nutrients in wastewater (phosphorus and nitrogenous compounds). Eutrophication, blue baby syndrome, DO depletion are all consequence of nutrients disposal in water bodies. Nutrients can be removed using known systems such as A2/O process and modified Bardenpho process. Phosphorus can also be removed chemically using ferrous and ferric ions or even aluminum. Nitrogen must be removed biologically by integrating anoxic conditions. The students will be exposed to simulations using GPS-X to appreciate and explore those systems. Considerations of internal recycling, clarification,

	anoxic and oxic treatments that allow optimal growth of nutrient consuming bacteria will be explained and modelled.
Aim	The aim of this module is to expose student to real-life case studies and to help them understand the importance of nutrient removal system and how they function
Learning Outcomes	At the end of this module learners will be able to: • Appreciate nutrient removal systems • Model an A2/O process • Model a Bardenpho process • Model a chemical diffuser system and link it to a WWTP
Units	Unit 5.1: Chemical removal and anoxic tanks Unit 5.2: A2/O Process Unit 5.3: Bardenpho process
Readings	• Theory and practice of water and wastewater treatment, by R.L. Droste, John Wiley and sons. • Wastewater engineering, by Metcalfe and Eddy, third edition, McGraw Hill. • All notes, lectures and textbooks assigned or provided by Dr. Jean Chatila for the Environmental Engineering II course. • Hand-outs prepared for students and distributed with each session • GPS-X User's Guide, GPS-X version 6.1. GPS-X Tutorial Guide: A STEP-BY-STEP GUIDE FOR LEARNING AND GETTING FAMILIAR WITH GPS-X, GPS-X version 6.

Activity	**Overview** Assignment 5.1: Advanced application using GPS-X version 6.2 of Hydromantis Inc 1. Create a wastewater treatment plant consisting of an influent of 3000 m^3/day with given concentrations. The system will consist of an in-line chemical dosage followed by a completely mixed activate sludge system. Set the phosphorus effluent to a target of 2mg/L. 2. Perform a sensitivity analysis evaluating the effect of the surface area of the secondary clarifier over the effluent. Choose a range between 0 and 600 m2 with a step increment of 20. 3. Show graphs showing the results. What is the optimal surface of the clarifier to obtain desired effluent? Test 2 1. In test 2 the students are required to model a nutrient removal system Final Exam 1. In the final exam the students are required to model a nutrient removal system Project The students will work with a team to design of fully functional treatment plants using GPS-X. This system will aim to remove nutrients in the most efficient manner and students will need to provide an optimal design.

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

Course Number:CIE434

The Civil Engineering Profession

Lebanese American University, Faculty of Engineering, Department of Civil Engineering

Fall Semester, 2014

Instructor Information

Instructor:	Dr. Gebran Karam
Office Location:	Bassil hall office 305
Telephone:	Office – +961 9 547254
Office Hours:	MWF 2:00 to 3:00 pm and 5:00 to 6:00 pm
E-mail:	gkaram@lau.edu.lb
Website:	WWW.LAU.EDU.LB

Course Identification

Course Number:	CIE 434
Course Name:	The Civil Engineering Profession
Course Location:	University Campus
Class Times:	MF: 3:00 to 3:50 pm & MW: 4:00 to 4:50 pm
Prerequisites:	Fourth year standing

Faculty Web Page: WWW.LAU.EDU.LB

Course Description/Overview

Introduction to the history and heritage of civil engineering; specialized sub disciplines; professionalism and professional registration and societies; continuing education; impact of historical and contemporary issues on the identification, formulation, and solution of engineering problems , impact of engineering solutions on the economy, environment, political landscape, and society. The course involves teamwork researching topics related to the impact of contemporary engineering solutions.

Course Learning Objectives

The material in this course is structured and focused on the course learning outcomes. Assigned student work and graded student performances are based on the course learning outcomes. These outcomes are assumed to be attained by the students when 70% or more of the students (not counting withdrawals) pass the course

Course Content Learning Outcomes

On the successful completion of this course, you will be able to:

9. Describe the role of the Civil Engineer in society
10. Describe the history and heritage of the profession and recall the achievements of famous engineers
11. Discuss relevant and applicable rules of conduct and ethics of the profession
12. Identify and Describe the different sub-disciplines of practice
13. Discuss the future role of civil engineers and the challenges they face

14. Understand and apply the ethics and basic rules of conduct of the profession
15. Identify, research and discuss contemporary issues and challenges facing civil engineers
16. Understand an apply general recommendations for the professional practice of civil engineering

Course Resources

Course Website(s)

Required Course Texts and Materials

Civil Engineer's Handbook of Professional Practice, K.L. Hansen and K.E. Zenobia, ASCE Press-John Wiley and Sons, 2011
The Vision for Civil Engineering for 2025, ASCE 2006
Ethics, Guidelines for Professional Conduct for Civil Engineers, ASCE January 2008
The ASCE Code of Ethics, Principles, Study and Applications, ASCE 2012
Additional reading material and handouts will be given in class

Optional Course Texts and Materials

Assignments and Grading Scheme

Grading System

0 to 4 (where 2 is the least pass mark)

Grading Policy

The course grade is calculated according to the following:

Two Tests or Projects	60%
Assignments and Class Participation	10%
Final	30%
Total Points	**100**

Course Policies.

Classroom Protocol

1-Attendance of all scheduled lectures and additional sessions is mandatory
2-Computer literacy and access to internet are required and non-negotiable.
3-Self learning is a key to continuous self-development and professional improvement; through the assignments and projects, this course will try to create conditions and situations where individuals or teams will be caused to research, collect, study and synthesize information in order to acquire knowledge, know how, and design skills.
4-All students are supposed to be proficient in oral and written English communication skills. Presentation, language, and professionalism will be considered in the grading of assignments, projects, and all other course work.
5-Honesty on Assignments, Projects, Exams, and Course work:
You will be assigned individual and group work. You are also welcome, and encouraged, to work on assigned individual problems and projects with fellow students. A good way to learn the material is in small study groups. Such groups work best if members have attempted the problems individually before meeting as a group. Of course, the assignment solution, project, or work that you turn in should reflect your own understanding, and not that of your fellow students. In other words, do not copy directly from other students. If it is obvious that such direct copying has occurred, we will disallow that homework. Individual work is required on all examinations taken in class.
Working groups will be formed at the beginning of the semester and will be asked to carry multiple assignments culminating in oral presentation and the submittal of written reports.
By attending lectures, taking exams, and presenting their work for grading all students are implicitly assumed to have read and agreed with all of the above.
As a general rule no make-up exams will be allowed. Class attendance and participation will be evaluated and included in the course grade.

This course is related to the following program outcomes:

2. Delivery and Assessment of Program Outcomes: (f) an understanding of professional and ethical responsibility; specifically with respect to the importance of professional licensure. (g) an ability to communicate effectively; specifically to write a document with the context, organization, format and style fitting the intended reader and purpose. (h) the broad education necessary to understand (know and

comprehend) the impact of engineering solutions in a global, environmental, economic, and societal context. (i) a recognition of the need for, and an ability to engage in lifelong learning; specifically recognize the need, identify the resources and opportunities, and conduct inquiry an research through independent projects and open ended problems.(j) knowledge of contemporary issues; specifically to identify and describe several contemporary issues and their impact on engineering activities and practice.
Assessment is accomplished through questions, similar in format to the FE examination, on the final exam. Questions are approved by the Program Assessment Committee. Attained by the students when 70% or more of the students score 70% of the points allocated to questions.

Delivery of Program Outcome: (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context. Specifically the knowledge of the impact of engineering solutions ina global, economic, environmental, and societal context, and the comprehension of the impact of engineering solutions in a global, economic, environmental, and societal context

Important Dates to Remember

Topics covered and course schedule

Week	**Topic**
Week 1	Definition and role of the Civil Engineering Profession.
Week 2-3	History and Heritage
Week 3-4	Professional and Legal organization of the profession and professional orders and societies
Week 5	Sub-disciplines of study and practice
Week 6-7	Ethics and Conduct
Week 8	Future Role of the Civil Engineer (ASCE Vision 2025)
Week 9-10	Challenges of Professional Practice and Contemporary Issues and Challenges
Week 10-14	Assigned case studies on climate change and global environmental issues and group projects discussion

APENDIX II: The CLIMASP Course Modules Template Example

Course	Curriculum and Hypermedia
Module 1	Definition and role of the Civil Engineering Profession
Key Concepts	Civil Engineering, Profession, Societal Role
Overview	Ask the students what a civil engineer does, go over the definition of the profession of engineering, and the etymology of "civil engineer"
Aim	Identify and describe the role of the Civil Engineer in society
Learning Outcomes	Describe the role of the Civil Engineer in society
Units	N/A
Readings	As assigned
Activity	Class open discussion, followed by anecdotal evidence provided by the students, and a presentation of what a "profession" is, what "civil" means when with "engineering", and what a "civil engineer" contributes to society in very general terms
Module 2	History and Heritage
Key Concepts	History, Heritage, Architecture, Builder, Civil Engineer, Historical role and common heritage, civilization
Overview	Review the recorded history of engineers and the different roles played through history and the heritage of the profession and its historical role in society
Aim	Be able to identify the particular history of civil engineering through the different historical accounts of architects and builders then civil engineers in the general history of mankind and identify the rich heritage of the profession across the centuries of recorded history and identify and describe the achievements of famous engineers
Learning	Describe the history and heritage of the profession and recall the

Outcomes	achievements of famous engineers
Units	N/A
Readings	As assigned
Activity	**Overview**
	Class open discussion, then live search on internet for the history of the profession and the accounts of great achievements of the profession; timeline of recorded history and civilizations with names and engineering projects as markers; individual assignment to research and present a famous civil engineer discussed in class and selections of students tabulated with respect to historical era, location, and achievements
Module 3	Professional and Legal organization of the profession and professional orders and societies
Key Concepts	Order of Engineers, Association, Legal Organization of the profession,
Overview	Identify the different forms under which the profession is organized in Lebanon and the USA and the applicable laws
Aim	Explore the different models of professional organization and the laws and rules that regulate it
Learning Outcomes	Identify forms of organization of the profession in Lebanon and the USA and the applicable laws
Units	N/A
Readings	As assigned
Activity	**Overview**
	Live exploration on internet of the websites of the Order of Engineers in Lebanon and the websites of the ASCE, ICE, and the NSPE and their content; reading on most relevant parts of the Engineering Law in Lebanon; discussion and comparison in class of the different

	organizational models of the "self organized" engineering profession versus common syndicates or scientific societies .
Module 4	Sub-disciplines of study and practice
Key Concepts	Sub-disciplines, specialty, study courses, areas of professional practice
Overview	Introduction of the different sub-disciplines of study and practice in Civil Engineering
Aim	Discuss and identify the different specialties of civil engineering and how they relate to the sub-disciplines of study and practice
Learning Outcomes	Identify and Describe the different sub-disciplines of practice
Units	N/A
Readings	As assigned
Activity	**Overview**
	Review of the different recognized sub-disciplines of civil engineering and how they relate to study areas and fields of specialization as well as the fields of practice to which they lead; students are asked to classify the courses of their study program under the different areas of specialty, then they are asked to select a sub-discipline and chart a course of graduate study in that area leading to specialized practice
Module 5	Ethics and Conduct
Key Concepts	Ethics, Professional Conduct, Laws
Overview	Introduction and review of the Ethics that characterize the civil engineering profession, and the required professional conduct, as well as the legal texts and laws that frame the practice
Aim	Develop a working understanding of professional ethics and conduct
Learning Outcomes	Understand and apply the ethics and basic rules of conduct of the profession

Units	N/A
Readings	As assigned
Activity	**Overview**
	Class guided reading and discussion of the ASCE Canons of Ethics as well as the relevant articles of the Law Organizing the Engineering Profession in Lebanon; review and comparison of similarities and wording; Case studies reviewed from various sources and additional ones assigned for group review, discussion/and or presentation
Module 6	Future Role of the Civil Engineer (ASCE Vision 2025)
Key Concepts	Future role of the civil engineer, multi-dimensional problem solver, steward to the environment and guarantor of the well being of the community
Overview	Presentation of the future role of the civil engineer as set in Vision 2025 of the ASCE with emphasis on sustainability and the various issues surrounding the stewardship to the environment and the maintenance of the well being of human communities
Aim	Develop an understanding of the future role of the civil engineer as set in Vision 2025 of the ASCE with emphasis on sustainability and the various issues surrounding the stewardship to the environment and the maintenance of the well being of human communities
Learning Outcomes	Demonstrate an understanding of the future role of the civil engineer as set in Vision 2025 of the ASCE with emphasis on sustainability and the various issues surrounding the stewardship to the environment and the maintenance of the well being of human communities
Units	N/A
Readings	As assigned

Activity	**Overview**
	Class guided reading of select parts of Vision 2025 and other related documents followed by open discussion of the multidimensional role of the civil engineer and the challenges the younger generation have to face; re-formulation of the mission of civil engineering as a steward to the environment and a guarantor of the well-being of communities and their economic prosperity and sustainability
Module 7	Challenges of Professional Practice and Contemporary Issues and Challenges
Key Concepts	Contemporary Issues, Challenges, Flexible and Adaptive Professional Practice
Overview	Presentation of the challenges faced by the professional practice in the coming decades, the contemporary challenges posed by demographic growth, finite resources, climate change (global warming, desertification, severe weather, environmental pollution) and the need to be flexible and adaptive and ready to reverse tradition engineering paradigms
Aim	Develop an understanding of the challenges faced by the professional practice in the coming decades, the contemporary challenges posed by demographic growth, finite resources, and the need to be flexible and adaptive and ready to reverse tradition engineering paradigms
Learning Outcomes	Identify, research and discuss contemporary issues and challenges facing civil engineers
Units	N/A
Readings	As assigned
Activity	**Overview**

	Class open discussion, review of the debate on climate change and global warming and its impacts on the practice of civil engineering at the level of design, operations and management; discussion of the probable causes of climate change and the cumulative impact of human demographic growth, finite natural resources; review of traditional "engineering design paradigms" versus the required adaptability and flexibility required i future practice where we will need to do more with less.

Module 8	Assigned case studies on climate change and global environmental issues and group projects discussion
Key Concepts	Climate change, global environmental challenges, sustainability, impact reduction, doing more with less
Overview	Research and present how one particular impact of Climate change affects the civil engineering profession in one particular field, and discuss the possible remedies or changes in practice to face the challengethrough a guided group project integrating all concepts learned
Aim	Integrate all the information received during the course into one research project about the challenges posed by Climate change to the civil engineering profession and how to face those challenges though the practice
Learning Outcomes	Identify, research and discuss a particular issue related to climate change and the challenges facing civil engineers because of it and develop general recommendations for the professional practice to remedy the impacts
Units	N/A

Readings	N/A
Activity	**Overview**
	Guided project development on the basis of groups of no more than 4 students culminating in one power point oral presentation and the submission of a final report. The presentation are made to the whole class and discussed afterwards

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

CIE 520

Solid Waste Management

Department of Civil Engineering, School of Engineering

Lebanese American University

Fall Semester ……

Instructor Information

Instructor: Dr. Mazen M. Haydar
Office Location: Engineering 702
Telephone: Office
Office Hours: After Class
E-mail: mazen.haydar@lau.edu.lb
Website:

Course Identification

Course Number: CIE 520
Course Name: Solid Waste Management
Course Location: Zakhem 404 - Byblos Campus
Class Times: TR 6:30 – 7:45 PM
Prerequisites: None
Faculty Web Page:

Course Description/Overview

This course deals with types and composition of municipal solid waste; storage, collection, and transfer of solid waste; treatment alternatives; final disposal; environmental monitoring of solid waste facilities; solid waste management; and environmental regulations related to solid waste.

Course Learning Objectives

The aim of this course is to understand the need for solid waste management, the consequences of poor solid waste management and how to develop a complete solid waste management plan, from waste characterization, to estimating storage volume, selecting waste collection system and providing safe disposal of wastes at a municipal solid waste landfill.

Course Content Learning Outcomes

At the conclusion of this course, each student will be able to do the following:

5- Estimate generated waste quantities and storage capacity.
6- Identify waste collection and transport methods.
7- Identify waste processing or treatment options (reuse, recycling, etc.).
8- Know the basic design elements of an engineered landfill.
9- Understand landfill permitting, operation, and environmental monitoring.

Course Resources

Course Website(s)

Required Course Texts and Materials

Integrated Solid Waste Management: Engineering Principles and Management issues, 1993, by George Tchobanoglous, Hilary Theisen, and Samuel A. Vigil, McGraw-Hill Eds.

Optional Course Texts and Materials

None.

Assignments and Grading Scheme

Grading System

Grading Policy

Evaluation of the student's final grade in the course will be based on his/her performance throughout the course and will be a combination of the following:

Item	Percentage
Term Paper (final report 15%, oral presentation 5%)	20%
Test 1	20%
Test 2	20%
Comprehensive Final Exam	40%

Completion of the online course evaluations is required. Students will not be able to access their course grades until they have completed the course evaluations.

Course Policies

Structure

Lecture	Two 75-minute lectures per week
Laboratory	None
Medium	All material explained in class and on the whiteboard
Tests	2 Tests-75 minutes - closed book

Final	120 minutes, comprehensive, closed book
Term Paper	Final report to be submitted, followed by a Class oral presentation.

Policy

Attendance

You are expected to attend all classes and arrive on time. Obtain prior clearance for planned absences.

Academic Integrity

The instructor will adhere to all LAU policies regarding academic integrity as stated http://www.lau.edu/policies.

Homework Policy

Assignments must be typed and must be turned in at the beginning of class on the day it is due, with no exceptions.

Exam Policy

No make-up for a test or a final will be given under any circumstance. In case of absence, the grade of the exam will be considered to be zero.

Cheating

Students caught cheating on an exam receive a grade of zero on the exam.

Course Schedule

Topic	Description
1	Types of waste
2	Solid waste composition and properties.
3	Solid waste generation and quantities.
4	Waste separation at source
5	Types of solid waste storage.
6	Solid waste collection and transport

7	Solid waste processing, recycling and reuse.
8	Landfill permitting.
9	Basics on landfill design and operation.
10	Environmental monitoring of landfills.
11	Post-closure care of landfills.
12	Leachate onsite and offsite management.
13	Landfill gas management.
14	Recycling.

APENDIX II: The CLIMASP Course Modules Template Example

Course	Solid Waste Management
Module 1	**Waste Characterization**
Key Concepts	Waste composition, waste characterization, waste sources and types.
Overview	In this module, we will introduce the sources of non-hazardous and hazardous

	solid wastes and discuss the difference between such wastes. It is important to determine which types of waste will be generated for a given development and how to develop a solid waste management plan that addresses handling, storage and treatment of the identified waste types. Waste types typically include residential, commercial, institutional, industrial, and agricultural. Other wastes, such as special wastes are becoming an important fraction of generated wastes that must be addressed with equal importance to the conventional waste types. In order to characterize the generated wastes, one must estimate their average daily generation rates. Generation rates of a given type of waste vary between countries and even between cities and neighborhoods within a given country. Thus, it is essential to study and understand the various factors, most specifically socio-economic factors that affect waste generation rates. Waste characterization requires a detailed sampling strategy in order to fully understand the physical, chemical and biological characteristic of the waste sample. Physical parameters such as unit weight, moisture content, and hydraulic conductivity; chemical parameters such as energy content; and biological parameters such as organic fraction and biodegradability factor all play an important role in selecting waste storage and processing measures. Weight-volume relationships are introduced in this module to help understand the type of physical, chemical or biological transformations needed to store, manage and treat the waste.
Aim	The main objective of this module is to introduce waste types and sources, understands their composition and analyse their properties.
Learning Outcomes	The student shall be able to: • Develop a basic waste sampling strategy for a given waste type • Understands waste composition • Understands physical, chemical and biological properties of solid wastes • Estimate waste generation rates
Units	1.1 - Sources, types, and composition of municipal solid wastes 1.2 - Physical, chemical, and biological properties of MSW

	1.3 - Solid waste generation and collection rates
Readings	Chapters 3, 4 and 6 *Integrated Solid Waste Management: Engineering Principles and Management issues, 1993, by George Tchobanoglous, Hilary Theisen, and Samuel A. Vigil, McGraw-Hill Eds.*
Activity	Assignments: • Estimate waste generation rates for a project development • Calculate waste volumes (uncompacted and compacted) • Calculate energy content of a waste sample
Module 2	**Waste Storage, Collection and Transport**
Key Concepts	Waste storage, waste separation at source, waste collection system, collection frequency, collection routes, and waste transfer stations.
Overview	It may be intuitive that solid wastes must be stored prior to collection. However, the way wastes are stored and the storage conditions may impact their treatment options and the cost of such treatment. Throughout this module, we explain the concept of waste separation at source, which results in the preservation of the physical integrity and quality of the waste resources. The socio-economic and health advantages of waste separation at source are evaluated versus that of separating wastes at a sorting facility. We shall address the various initiatives to promote waste separation at source, starting with environmental awareness to financial incentives and legislative actions. Successful examples of waste separation at source programs will be shared. Waste storage varies between urban and rural settings. It has to consider the land use and be in harmony with its surroundings in order to minimize any impacts on visual amenity. In urban environments, waste storage shall vary between low-rise, medium-rise and high-rise residential buildings in urban settings and that .The integration of waste storage rooms into the design of these buildings is evaluated in comparison with curbside waste storage and collection. The criteria for the selection of the container location, type and storage capacity is also discussed in this module. Special note will be given on the compatibility of waste containers with waste collection trucks. For high-

	rise buildings, the socio-economic and environmental benefits of installing a garbage chute (single, dual or single chute with a diverter) is evaluated versus that of providing conventional waste separation and transfer solutions. Advances in waste storage and transport have introduced the concept of pneumatic waste storage and transport. The popularity of this system is increasing in the Arabian Gulf region. If not evaluated properly, such system may be cost ineffective and may lead to several operational issues. In this module, we shall introduce the design criteria and technical requirements for such system. We shall also present several examples where such system is operational. Waste collection services are typically conducted through the municipal authorities, who in turn dictate the waste collection frequency and waste collection routes. In cases where private contractors are authorized to collect wastes, it is imperative to set criteria for the collection equipment, collection frequency and collection routes. Such criteria must be approved by the Owner of the development and the municipal authorities. The incompatibility between waste collection containers and waste collection trucks may hinder the collection process, making it time consuming and costly. In this section, we shall discuss the various waste collection methods and equipment used. We will introduce the main two types of waste collection systems: stationary and hauled collection systems, and present an evaluation of these systems in terms of labor, time and costs. Finally, we shall introduce waste transfer stations and highlight their importance in reducing waste transportation costs, which typically overburden the budget of any solid waste management system. Waste transfer stations vary in their size and design. We shall discuss the permitting requirements of these stations and evaluate the different types and designs in urban and rural settings. The importance of health and safety requirements to operate such facility is highlighted. The selection of the transfer system, whether direct load, discharge and load, or a combination of both is evaluated in terms of equipment, labor, and environmental risks.
Aim	The main objective of this module is to introduce explore various types of

	waste storage, waste separation at source, waste collection systems and waste transfer stations.
Learning Outcomes	The student shall be able to: • Design a waste storage and collection plan • Determine the type of waste collection system and the need for a waste transfer station
Units	2.1 – Waste Handling and Separation, Storage, and Processing at the Source 2.2 – Collection of Solid Waste 2.3 – Transfer and Transport
Readings	Chapters 7, 8 and 10 *Integrated Solid Waste Management: Engineering Principles and Management issues, 1993, by George Tchobanoglous, Hilary Theisen, and Samuel A. Vigil, McGraw-Hill Eds.*
Activity	Assignments: • Select the location and type of waste containers • Estimate the storage volume of waste containers • Develop a waste separation at source program • Prepare a preliminary waste collection route
Module 3	**Waste Processing and Transformation**
Key Concepts	Waste sorting plant, waste separation, waste processing, composting and combustion.
Overview	Following the collection and transfer of wastes, mixed wastes must be separated, and then their integrity and quality are evaluated in order to assess their potential for reuse or recycling. An overview of the various sorting steps to be conducted at a waste sorting plant is introduced in this module. For each waste category, conveying system and equipment needed for processing and treatment are presented. Various waste processing techniques including mechanical screening, air classification, magnetic separation, shredding, and compaction are also presented. We shall present several diagrams showing the various potential separation and processing cycle of a mixed waste sample

	(from the receiving area to shipment). This section will be closed by discussing the health and safety requirements for operating a sorting plant. The second part of this module will focus on the chemical and biological transformations that can render the waste more stabilized. The main two transformation techniques include composting and combustion. While composting is a natural process that renders the organic fraction of the waste into a stabilized compost product with almost minimal residue, combustion processes are typically more complicated and require extensive environmental monitoring and treatment. We will discuss the design criteria for composting plants, and present the main two types of composting processes (agitated and aerated). We shall evaluate these two systems in terms of space required, labor, operation, process control and duration. Furthermore, we will introduce in-vessel composting techniques that are commercially available. Finally, we will present the main criteria used to evaluate the quality of the final compost product and its market value. Combustion is considered advantageous when waste production is high with limited space for landfilling. Combustion significantly reduces the waste volume and can be used to recover significant quantities of energy. For combustion, we shall present and evaluated the main two techniques of combustion (mass derived fuel and refuse derived fuel). We shall discuss necessary control equipment needed to minimize environmental risks associated with liquid emissions, gaseous emissions and solid residues. We will conclude this section with a technical evaluation between composting, landfilling and combustion.
Aim	The main objective of this module is to introduce waste processing techniques that are commonly used at a waste sorting plant and waste transformation through composting and combustion.
Learning Outcomes	The student shall be able to: • Understand the processing line of a waste sorting plant • Evaluate the advantages and disadvantages of waste transformation using composting and combustion
Units	3.1 – Separation and Processing and Transformation of Solid Waste 3.2 – Materials Separation and Processing Technologies

	3.3 – Biological and Thermal Conversion Techniques
Readings	Chapters 9, 12, 13 and 14 *Integrated Solid Waste Management: Engineering Principles and Management issues, 1993, by George Tchobanoglous, Hilary Theisen, and Samuel A. Vigil, McGraw-Hill Eds.*
Activity	Assignments: • Identify appropriate waste separation and processing techniques for various compositions of waste streams
Module 4	**Landfill Permitting, Design , Operation and Monitoring**
Key Concepts	Landfill permitting, Landfill design and operation, waste placement, leachate management, landfill gas management, and environmental monitoring of landfills.
Overview	Not in my back yard, that is what most repeats when landfill permitting is being discussed. The social and environmental risks associated with the landfill process make it a challenge to site new landfills. In this module, we shall discuss the climatic, physical, hydrogeological, social and environmental parameters for siting a new landfill. We will briefly discuss the environmental impact assessment (EIA) process required prior to environmentally accepting a site for landfill construction. We will briefly discuss the various types of landfills and then provide an overview of the basic design elements of a municipal solid waste landfill. We shall carefully explore the liner system and leachate collection system at the bottom of the landfill, as well as the landfill cover system. The required steps for site preparation, the strategy for waste placement, and the day-to-day operations will be presented. We shall discuss the main challenges facing the operation of MSW landfills, specially odors, leachate seeps, and leachate and landfill gas management. In this module, we shall discuss the main factors affecting leachate generation rates. The hazardous nature of leachate makes it a risk to the groundwater and to any ecosystem downstream of the landfill. Thus, leachate must be adequately collected from the bottom of the landfill and not allowed to seep horizontally or infiltrate vertically downward. We shall explore the various

	elements of leachate collection system that can help maintain a safe leachate head on the liner. On-site leachate management techniques will be presented, including leachate recirculation and onsite/offsite leachate treatment. The main advantages and disadvantages of leachate reticulation will be evaluated. Furthermore, we shall present the various surface and subsurface leachate recirculation techniques and explore the results of a field-scale testing of a permeable blanket and the geotechnical sensing system installed to monitor leachate movement in the blanket. We shall explore the composition of landfill gas and discuss the importance of landfill gas management in the operation of municipal solid waste landfills, especially landfills that operate as a bioreactor. The conditions that control landfill gas generation and migration will be discussed in this section. Landfill gas collection methods and on-site treatment for the recovery of energy will be addressed as well. Finally, we shall address the various geotechnical and environmental monitoring needed throughout the life of a landfill and in post-closure care period. We will introduce the need for maintaining the landfill cover and the stormwater system. Also, we shall discuss the rationale for placing groundwater and gas monitoring wells. An evaluation of the landfill operational and maintenance life cycle will be given at the end of this section.
Aim	The main objective of this module is to introduce the safe disposal of wastes in engineered landfills, the main design criteria and landfill operational activities, landfill leachate and gas management alternatives, and landfill environmental monitoring.
Learning Outcomes	The student shall be able to: • Know the criteria for landfill siting • Understand the basic design elements of an engineered landfill • Evaluate leachate and landfill gas management alternatives • Know about environmental monitoring of landfill during lifetime and in post-closure care
Units	4.1 – Disposal of Solid Wastes 4.2 – Closure of Landfills

Readings	Chapters 11 and 16 *Integrated Solid Waste Management: Engineering Principles and Management issues, 1993, by George Tchobanoglous, Hilary Theisen, and Samuel A. Vigil, McGraw-Hill Eds.*
Activity	Assignments: • Draw cross-sections of landfill and landfill elements • Determine the location of groundwater monitoring wells • Estimate the landfill design capacity
Module 5	**Impact of Solid Waste Management on Climate Change**
Key Concepts	Climate change relation to solid waste management, waste to energy, and landfill greenhouse gas emissions.
Overview	In this module, we shall discuss the relationship between solid waste management and climate change through the direct and indirect impacts of solid waste management strategies on air quality. The uncontrolled emissions of greenhouse landfill gases to the environment can be considered the major impact of solid waste facilities on air quality, thus control measures have been developed and enforced to reduce such impacts. We shall present the recovery of landfill gas and its conversion to energy. Also, we shall explore international standards related to the control of landfill gas emissions. Other solid waste management measures that have a considerable impact on air quality include waste transportation, the use of transfer stations, and waste treatment options (specifically composting and combustion). Finally, the lack of an adequate solid waste management system has an indirect impact on air quality through uncontrolled open air burning of solid wastes and energy losses due to low recovery rates and (low recycling potential).
Aim	The main objective of this module is to explore the impact of solid waste strategies on the release of air emissions and greenhouse gases and to develop sustainable measures to reduce the impact of solid wastes on climate change.
Learning Outcomes	The student shall be able to: • Understand the main impacts of solid waste management on air

	quality and climate change. • Evaluate sustainable strategies to reduce impact of solid wastes on the use of energy and consumption of natural resources.
Units	5.1 – Landfill gas to Energy 5.2 – Impact of sustainable waste management on air quality
Readings	*Hand notes prepared by the Instructor.*
Activity	Assignments: • Estimate landfill gas rates from a typical landfill and greenhouse gas quantities generated from a typical MSW landfill. Project: • Prepare a term paper that addresses the impact of solid waste strategies on air quality and climate change. Alternatively, you may select topics related to technologies used in solid waste processing and treatment.

APENDIX I: The CLIMASP Course Syllabus Template Example

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

CIE 521

Hydrology

Department of Civil Engineering, School of Engineering & Architecture

Lebanese American University

SpringSemester ……

Instructor Information

Instructor: Dr. Ghassan Mikati

Office Location:

Telephone: Office

Office Hours:

E-mail:

Website:

Course Identification

Course Number: CIE 521

Course Name: Hydrology

Course Location: Byblos Campus

Class Times: T-Th 2:00-3:15

Prerequisites: Hydraulics

Faculty Web Page:

Course Description/Overview

CIE521 Hydrology [3-0, 3 cr.] Occurrence of water, precipitation, interception, depression storage, infiltration, evaporation, transpiration, snow melt, well hydraulics, stream flow, data sources, instrumentation, runoff and hydrographs, hydrograph routing, probability in hydrologic design, and introduction to hydrologic modeling. Prerequisite: CIE322 Hydraulics.

Course Learning Objectives

At the conclusion of this course, each student will be able to do the following.

1. To understand the interaction among runoff, floods, droughts, and stream water quality
2. To predict the inter-relationships between rainfall, runoff, floods, droughts, and stream quality
3. **To provide the student with a clear and thorough presentation of the theory and applications of the occurrence, distribution, movement, and properties of the water of our planet the Earth.**
4. **To learn the underlying hydrologic science and processes associated with water flow**
5. To analyze hydrological data and understand hydrological modeling
6. To learn concepts of stream flow
7. To learn the factors affecting water yield, low flows, peak flows, surface erosion, landslides, water quality, large wood, and stream quality.
8. To describe how water resources interact

Course Resources

Course Website(s)

Required Course Texts and Materials

- Material will be distributed in class. Readings will be assigned whenever necessary

Additional References

Optional Course Texts and Materials

- Introduction to Hydrology, by Warren Viessman, Jr. and Gary L. Lewis, fourth edition, Harper Collins.
- Applied Hydrology, by V.T. Chow, D.R. Maidment, and L.W. Mays, McGraw Hill.

Assignments and Grading Scheme

Grading System

Grading Policy

Exam 1:	25%
Exam 2:	25%
Final:	35%
Assignments & Project	10%
Attendance and Participation:	5%

Course Policies

Structure

	Description
Lecture	Two 75-minute lectures per week
Laboratory	None

Medium	all material explained in class and on the whiteboard
Tests	Two 75 minute exams
Final	120 minutes, comprehensive
H.W.	Assignments
Projects	(1) Design project

Policy

Attendance is obligatory.
Homework is to be submitted according to pre-arranged schedule

Additional Notes

- A student can miss no more than 4 sessions of instruction. By the 5th session, the instructor may ask the student to drop the course.
- Plagiarism: students caught cheating on an exam receive a grade of Zero on the exam in the first cheating attempt and a warning. Students caught cheating for the second time in the same course receive an F grade in the course and a second warning. A grade of zero on an exam resulting from cheating must be counted in the student's course grade. The zero cannot be dropped in computing the final grade in case the instructor has a policy of allowing students to drop their worst exam grade.
- Any student who receives 3 warnings will be suspended

Course Schedule

Week 1	Introduction to hydrology and the hydrologic cycle
Week 2	Precipitation

Week 3	Interception and depression storage
Week 4	Infiltration
Week 5	Infiltration
Week 6	Evaporation and Transportation
Week 7	Stream flow
Week 8	Hydrologic data sources and monitoring networks
Week 9	Probability and Statistics
Week 10	Runoff and Hydrographs
Week 11	Runoff and Hydrographs
Week 12	Unit Hydrographs
Week 13	Unit Hydrographs
Week 14	Hydrograph Routing
Week 15	Groundwater Hydrology

Course	***Hydrology***
Module 1	Hydrologic Cycle
Key Concepts	Hydrologic cycle definition and concepts
Overview	Understanding the hydrologic cycle: The water cycle across the globe and across climate changes and differences
Aim	The aim of this module is to make students understand the hydrologic cycle elements
Learning Outcomes	At the end of this module learners will be able to: • Differentiate between different climates • Understand the water cycle of Earth • Determine the temporal changes in hydrology
Units	Unit 1.1 Overview
Readings	Material Provided in class
Activity	**Overview** Assignment 1.1: Readings
Module 2	Precipitation and Infiltration
Key Concepts	Precipitation, Interception, Depression Storage, and Infiltration

Overview	This module introduces the concept of Precipitation, Interception, Depression Storage, and Infiltration on top of soils. Students will learn the different steps a drop of water will go through before being stored in soil
Aim	To be familiar with The concepts of Precipitation, Interception, Depression Storage, and Infiltration
Learning Outcomes	• At the end of this module learners will be able to: • Understand the different patterns of this process • Calculate infiltration
Units	Unit 2.1: Precipitation Unit 2.2: Interception Unit 2.3: Storage Depression Unit 2.4: Infiltration
Readings	Material Provided in class
Activity	**Overview**
	Assignment 2.1: Calculate precipitation Assignment 2.2: Calculate Infiltration
Module 3	Evapotranspiration (ET)
Key Concepts	Evaporation, Transpiration and Evapotranspiration Concepts
Overview	This module introduces the concept of ET, and the different equations used to predict ET in different regions and climatic conditions
Aim	To be familiar with ET equations and calculation
Learning Outcomes	• At the end of this module learners will be able to: • Understand the different ET equations • Be able to choose the right ET equation based on conditions • Calculate ET
Units	Unit 3.1: Get familiar with ET concepts

	Unit 3.2: Discuss the Penmann Monteith ET equation Unit 3.3: Discuss the FAO Heargreaves ET equation Unit 3.4: Calculate ET of different crops
Readings	Material Provided in class
Activity	**Overview**
	Assignment 3.1: Solar radiation calculation Assignment 3.2: Reference ET calculations Assignment 3.3: Crop ET calculation
Module 4	Stream Flow and Hydrographs
Key Concepts	Introducing: - Stream flows - Probability Concepts - Runoff - Hydrographs and Unit Hydrographs
Overview	Define the principles of hydrologic analysis and hydrograph computaions
Aim	To introduce the student to the ways estimates and calculations are done as to the amount of water passing through a certain point at a given time
Learning Outcomes	At the end of this module learners will be able to: • Design a hydrograph • Make calculation pertaining to hydrographs
Units	- Unit 4.1: Stream flows - Unit 4.2: Hydrologic data sources and monitoring networks - Unit 4.3: Probability and Statistics - Unit 4.4: Runoff and Hydrographs

	- Unit 4.5: Unit Hydrographs
Readings	Material Provided in class
Activity	**Overview**
	Assignment 4.1: Design and make calculation on hydrographs using different methods

Course Syllabus

BIO 203

Introduction to Ecology

Lebanese American University (LAU),

Semester, Fall 2014

Instructor Information

Instructor: A/Prof. Christian Khalil

Office Location: Bloc A, room 805, Jbeil Campus

Telephone: Office – +961 9 547 262 Ext 2466

Office Hours: Tuesday 8:00 – 14:00, Thursday 8000 – 14.00

E-mail: Christian.khalil@lau.edu.lb

Website:

Course Identification

Course Number:	**Bio 203**
Course Name:	**Introduction to Ecology**
Course Location:	FREM 403 – Jbeil Campus
Class Times:	Tuesday 14:00 – 15:15, Thursday 14:00 – 15:15
Prerequisites:	N/A
Faculty Web Page:	http://www.lau.edu.lb

Course Description/Overview

This course introduces the organization of individual organisms into populations, communities, and ecosystems. It focuses on the interactions between living organisms and their physical environment. Concepts such as diversity, competition, natural selection, adaptation, climate changes, migration, extinction and deforestation are covered. Additionally, the course tackles concepts of environmental microbiology in relation to pollution, remediation and recycling of liquid and solid wastes.

Course Learning Objectives

This course introduces students not majoring in biology, especially civil engineering students, to the basic principles of ecology, thus enabling them to understand how organisms interact with the biotic and abiotic environment and allowing them to come up with solutions to challenges posed by expanding populations as well as development.

The specific learning objectives of this course are:

1. To understand the scientific method and its application in ecology.
2. To develop a hierarchal perspective and approach to ecology.
3. To familiarize students with the major ecological concepts, patterns and processes.
4. To familiarize students with the natural history of aquatic and terrestrial ecosystems and the environmental factors that determines the biological diversity of these environments.
5. To provide students with the scientific background necessary to critically analyze major ecological problems and their solutions

Course Content Learning Outcomes

When completing this course, students will be able to

12. Have acquired well established scientific principles and concepts that form the knowledge basis for an appropriate interaction with the natural environment.
13. Develop the scientific ability to evaluate the reliability of sources of information pertaining to ecological issues.
14. Develop the ability to analyse and interpret different representations of ecological data (graphs, charts, tables, diagrams….).
15. Develop the ability to analyse ecological problems, caused by human population growth, economic growth and development, as well as their solutions logically and critically.
16. Understand the natural history of major terrestrial and aquatic ecosystems and their inhabitants.
17. Understand the characteristics of populations, as well as the factors influencing population structure and processes.
18. Explain interactions among organisms and the evolutionary effects of the interactions on the species involved.
19. Understand the factors controlling ecological communities and ecosystems.
20. Apply the ecological principles acquired in this course when addressing problems in their field of study.
21. Have a heightened sense of ethics and morality in dealing with biodiversity, the physical environment, or people of other cultures and religions.

Course Resources

The chapters of the textbooks (Greipsson 2011 (G); Miller and Spoolman 2012(MS)) pertaining to each lecture are provided in the following tentative schedule. You are encouraged to complete reading the chapter pertaining to a lecture before you come to that lecture

Optional Course Texts and Materials

N/A

Assignments and Grading Scheme

Grading System

Grading:

Exam I	27%
Exam II	27%
Final Exam	27%
In-class Assessments and Assignments	14%
Attendance and Participation	5%

There will be no make-ups for any missed exam, assignment or assessment!!

Course Policies

Student Conduct:
In this course, you will develop an appreciation of the importance of honesty and integrity in scientific conduct. You will be expected to adhere to the Lebanese American University's honor code and student code of conduct at all times. I will not tolerate any plagiarism, cheating on exams, failing to participate in group work, and engaging in disruptive behavior in the lecture. Kindly report any violations of the honor code to me as soon as possible.

Policy on Cheating and Plagiarism:
Students caught cheating on an exam/quiz/assessment will receive a grade of zero on that exam/quiz/assessment in their first cheating attempt and receive a warning. Students caught cheating for the second time will receive a grade of "F" in the course and another warning.

Plagiarism on assignments and project work is a serious offense. If plagiarism is detected, a student will be subject to penalty, similar to the cheating case, which ranges from receiving a zero on the assignment concerned to an "F" in the course in addition to a warning.

All written work submitted to me (in any form) should include the following statement *in verbatim*: "In completing this work, I have abided by the Honor Code of the Lebanese American University." The statement should be signed.

Attendance Policy:

You are expected to attend all lectures. You will be responsible for all announcements made and material covered in any class you miss. Lectures start at 8:00 AM sharp; you may be denied access to class that day if you arrive more than 10 minutes late. Once you are in class, you cannot leave for any reason. If you choose to leave, you cannot come back and you will be considered absent for that day.

Please note that missing one third the lectures implies that you will have to drop the course. This is a university policy and will be strictly enforced.

Scheduled field trips constitute part of the course. You are expected to arrive on time on the day of the field trip. We will not wait for you if you are late. **Missing a fieldtrip is equivalent to missing three lectures.** Due to the nature of fieldtrips, students are expected to obey classroom rules during these trips. Smoking in the bus will **not** be tolerated but may be allowed during rest stops. Students leaving the group at any point during the fieldtrip do so at their own risk and may be issued a warning. Students may be allowed off the bus on the way back at the instructor's discretion. **Please bear in mind that a field trip is not a picnic or a hike!!**

Withdrawal Policy:
According to the university catalog, "Students wishing to withdraw from one or more courses must follow the withdrawal procedure provided by the Registrar's Office. Students withdrawing from courses after the late registration period and before the withdrawal deadline will receive Ws for all the courses in progress." **Please note that the last day to withdraw from classes this semester (please check with registrar.) Students wishing to withdraw the course must do so by themselves.**

Other Policies:
Exams: Exams will cover all the material discussed in class (including videos, guest lectures and assigned readings). There will be no make-ups for missed exams. A missed exam will receive a grade of zero. All exam grades count and none will be dropped. You are required to bring your IDs to exams. Cell phones and pagers must be turned off and put away during exams.

Class Conduct and Participation: You are expected to be physically and mentally present in all lectures. Eating, drinking and smoking are prohibited during class time. Cell phones and pagers must be turned off or set to silent mode during the lectures. They must also be out of sight. **If I see cell phones or pagers, they leave with their owners.** Disruptive behavior will not be tolerated in class and will be handled according to the university rules and regulations.

In-class activities may be given any time during the lecture. These may include out-door or in-door activities. They may also include short-answer questions, short essay questions or interpretation of graphs and/or tabular data.

You will not be allowed to make-up missed activities or assignments.

Difficulties and Special Needs:
If you are experiencing difficulties with course content or with anything that I can help you with, please let me know. Also inform me as soon as possible of any special needs you might have, particularly medical conditions that may require special accommodation.

Conflict Resolution:
If you are having problems with another student in the class, please bring it to my attention. If you have problems with me, please let me know as soon as you can. Any issues that we cannot resolve can be taken to the chairperson of the Department of Natural Science, Prof. Ahmad Kabbani.

Changes:
I reserve the right to make reasonable changes to this syllabus provided that I give all students registered in the class a timely notification of the changes to be made.

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

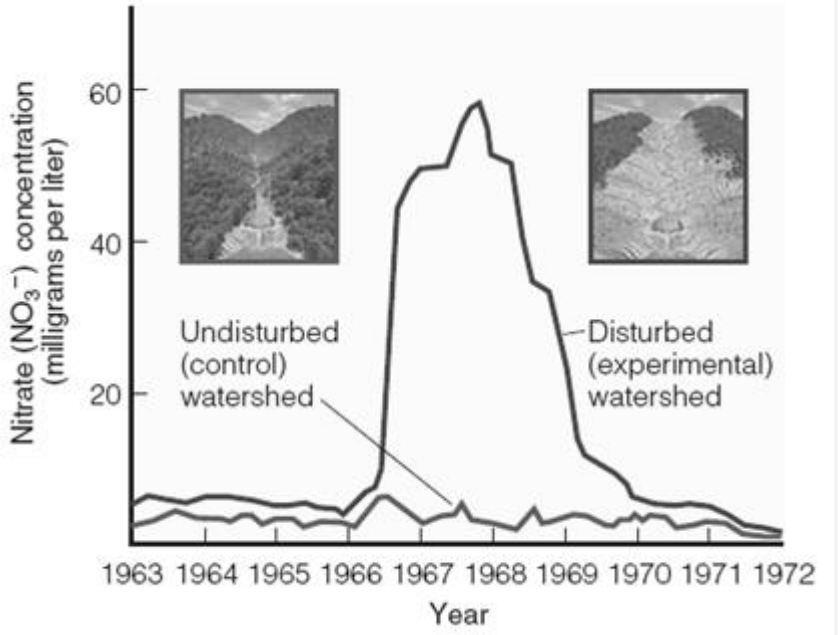
Week of Assignment	Topic	Reading
Week 1	1. Course syllabus and logistics Iintroduction	Course syllabus Chapters 2, 3

	2. Hierarchy of ecological organization 3. Scientific method and its applications in Ecology	
Week 2	1. Energy 2. Systems and how they respond to change 3. The abiotic environment: Climate	Chapters 2, 7
Week 3	The abiotic environment: climate, water, soil and light	Chapter 7 Chapter 8
Week 4	1. Populations, their growth, limits and control 2. Intraspecific and interspecific interactions	Chapter 5
Week 5, 6	1. Ecosystems 2. Ecosystem assembly and functioning	Chapter 3 Chapters 2, 5
Week 7	1. Succession 2. Major terrestrial and aquatic ecosystems	Chapter 4 Chapters 5
Week 8,9,10	1. Biodiversity 2. Ecological surveys	Chapters 4, 9, 10, Chapter 3, 7, 11, 12
Week 11	1. Ecosystem dynamics under changing climates	
Week 12	1. Environmental microbiology 2. Phytoremidiation and bioremidiation	Chapter 10
Week 13	1. Landscape ecology	Chapter 6

	2. Ecological landscape design 3. Ecological Natural hazards	
Week 14	1. Outcomes and measurements of Natural hazards 2. Doms, Roads, bridges and their ecological effects	
Week 15	Restoration ecology	Chapter 1, 14

Course	**Curriculum and Hypermedia**
Module 1	Curriculum: Different Types and Functions
Key Concepts	Curriculum theory and types, technology,
Overview	Module 1 is an introductory module where students are introduced to the course syllabus and key dates for this subject. In this module we cover an overview of ecological salient issues and introduce key concepts such as hierarchy of ecological organisations, laws of thermodynamics, population growth and the use of scientific method in ecology.
Aim	The overriding aim of this module is to introduce the subject and introduce students to scientific thinking through the discussion of the scientific method and its applications. The module also discusses ecological concepts such as the hierarchy of ecological organisation a key concept in Ecology.
Learning Outcomes	At the end of this module learners will be able to: • Use that in describing what is likely to happen in nature. • Ask a question or identify a problem to investigate.

	• Use scientific data through observation and measurement. Experiments may be used to study specific phenomena. • Understand major components of complex systems are environmental inputs, flows within the system, and outputs to the environment. • Understand law of thermodynamics • Understand population growth
Units	Chapter 2 – Hierarchy of ecological organization Chapter 3 – Scientific method and its application
Readings	
Activity	**Overview of Class Exercise** 1. In recent years, the controversy over whether humans play a major role in global warming was fueled by critics who stated "not enough good science" had been done. Using such concepts as the scientific process, peer review, and reliable science discuss why this may or may not have been an accurate statement. 2. Explain how the human body is intimately connected to the two laws of thermodynamics.



3. After looking at the figure above, explain the significant difference that occurred between 1966 and 1970 in terms of the two lines representing the control watershed and the experimental watershed.

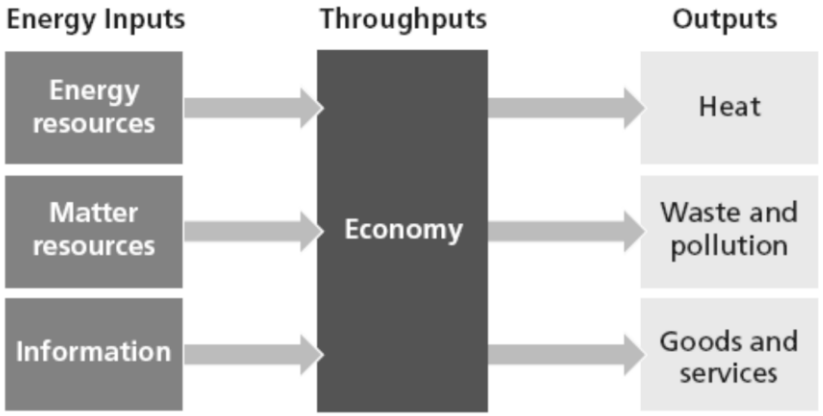
4. Much of the energy produced is lost before it can become useful. Explain how energy efficiency, or energy productivity, and the second law of thermodynamics may be useful in a discussion with another person on how to reduce CO_2 and other greenhouse gas emissions.

5. The population of any organism will increase, if the conditions are correct, until it reaches a point where the population cannot be sustained. This is a type

of feedback loop. What type of feedback loop is this and what are the conditions that cause the feedback loop to function?

6. How is the concept of an environmental threshold or tipping point important in regards to global warming?

7. Differentiate between a hypothesis, a guess, and a theory. Explain why it is important for non-scientists to understand how scientists use these terms when discussing something like global warming or evolution. Why might it be incorrect when a non-scientist dismisses a topic like these as being "just a theory"?



8. The figure above indicates the general flow within an economic system. For many years this concept has been thought of as indicative of individual nations, or subunits of nations. Now it is increasingly indicative of a global economy. What changes are occurring as a result of this change to the global economy?

	.
Module 2	Energy, systems and climate
Key Concepts	Energy, systems and climate
Overview	This chapter is building on chapter 1 and is using the scientific method and experimentation to shed some light on three key concepts: 1. Energy, 2. Systems and 3. Climate
Aim	The chapter presents the major components of complex systems, it is presenting concepts such as environmental inputs and outputs within systems in the environment. The chapter also addresses he major forms of energy such as kinetic energy and potential energy. The last part of the lecture is linking energy and systems to climate. Students are introduced to climate, its formation and its impact on ecosystems.
Learning Outcomes	At the end of this module learners will be able to: ○ Understand energy movement in Ecosystems ○ Understand ecological systems ○ Understand the basics of climate
Units	1. Chapter 2 : Energy 2. Chapter 7 systems and how they respond to change
Additional Materials	**Acid Rain The Invisible Threat (Video plus Lab)** Hands-on lab activities plus video. http://www.kelvin.com/Merchant2/merchant.mv?Screen=PROD&Store_Code=K&Product_Code=360042

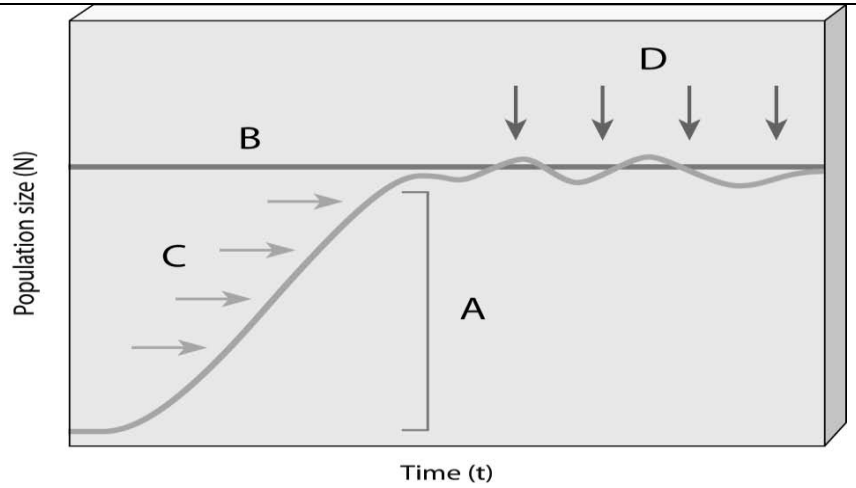
	The Particle Adventure An exploration of the fundamentals of matter from the Lawrence Berkeley Labs. http://www.particleadventure.org/
Activity	**Class Exercise Overview**
	4. Briefly summarize the component parts (e.g., heat from the tropics, dense salt water, melting ice, etc.) of the ocean currents as they travel from the North Atlantic to the Pacific and back. 5. What would be the result if the ocean's currents did not function? 6. Briefly summarize the El Niño Southern Oscillation. 7. Using the environmental factors of moisture and temperature, describe the relationship between the three types of biomes (e.g., grasslands or forests). **8.** The author indicates that attempting to strike a balance between exploitation of terrestrial natural capital and conservation of that capital is controversial. What might you say to a person whose livelihood comes from the timber industry (or mining, or agriculture making heavy use of irrigation) to encourage consideration of the ongoing degradation of the natural capital and its eventual impact on him/her?
Module 3	Climate Water soil and light
Key Concepts	Introducing the Abiotic Environment
Overview	The chapter will introduce the following key topics:

	1. Earth's weather and its linkage to atmospheric conditions such as temperature, pressure, moisture content, sunshine, cloud cover, precipitation, wind direction, and wind speed. 2. Climate is a region's long-term atmospheric conditions over decades. The two main factors in determining climate are average temperature and average precipitation. 3. The average climate—annual precipitation and temperature—determines terrestrial regions with characteristic types of natural ecological communities. According to these two factors, biomes form. 4. The major types of desert biomes are hot, medium, and cold. Human activities have created large desert cities, destroyed soil through urban development and off-road vehicles, salinized the soil through irrigation, depleted underground water supplies, disturbed land and polluted, stored toxic and radioactive wastes, and located arrays of solar cells and solar collectors. 5. The three major types of grasslands are tropical or savannas, temperate grasslands, and polar grassland/tundra. The savannas have been destroyed by grazing cattle, which destroy vegetation and kills grass through fecal droppings. The temperate grasslands have been used to grow crops and graze animals. As a result, the grasslands have disappeared. The arctic tundra has been compromised by oil drilling, mines, and military bases. 6. The three main types of forest biomes are tropical, temperate, and polar/boreal. Human activities have destroyed much of the native trees;

	grazing has compromised the vegetation and eliminated food sources for native animals. And the deforestation has changed the tropical forest's ecosystem, leading to death of plants and animals. The temperate forest has a fewer number of broadleaf trees and rich forest soil; but fires, logging, and hunting have undermined this type of forest. The evergreen firs of the polar forest support a variety of wildlife. But oil drilling and oil spills have compromised the water, the wildlife, and the vegetation in the arctic. 7. Mountain and arctic biomes play important ecological roles; they help regulate climate and effect sea levels. Mountain biome degradation arises from timber and mining extraction, from hydroelectric dams and reservoirs, from air pollution, increased tourism, and radiation from ozone depletion.
Aim	This module aims at examining the relationship between light soil and climate.
Learning Outcomes	• Understand the Abiotic Environment; • Impact of light on natural systems; • The role that soil play in the abiotic environment.
Units	• Chapter 7: Abiotic Environment • Chapter 8: Soil and light
Readings& additional resources	**After the Storm** (Documentary, free DVD or VHS) Looks at watersheds and their importance in various parts of the U.S. http://www.epa.gov/weatherchannel/video.html **Blue Planet** (Video series, Discovery Channel, 2001)

	Mammoth series, five years in the making, taking a look at the rich tapestry of life in the world's oceans. http://dsc.discovery.com/convergence/blueplanet/blueplanet.html **Conserving America: The Wetlands** (PBS, 1994) A four-part series on American Conservation of wetlands **Conserving America: The Rivers** (PBS, 1994) **Conserving America: The Challenge on the Coast** (PBS, 1994) **Conserving America: The Wetlands** (PBS, 1994) **Last Journey for the Leatherback?** Looks at the effects of overfishing on sea turtles. http://www.greentreks.org/naturalheroes/season2/lastjourney.asp **Ocean Oasis** (Documentary, San Diego Natural History Museum, 2001) Biodiversity in the Sea of Cortez, and the deserts of Baja. http://www.oceanoasis.org/toc.html **We all Live Downstream** (Documentary, 1991) A look at pollution in the Mississippi River and the effects on human health. http://www.videoproject.com/wea-281-v.html **Web Resources**

	Bridge http://www.vims.edu/bridge/ A variety of resources for teachers that may be adaptable to the college level. **Centers for Ocean Sciences Education Excellence** http://www.cosee.net/ Contains a variety of resources for ocean education. **EPA Wetlands Education** http://www.epa.gov/owow/wetlands/education/ Contains a variety of resources for teaching about the significance of wetlands.
Activity	**Overview** 1. Briefly explain the major types of organisms in aquatic life zones, giving an example of each. 2. Briefly explain why estuaries and coastal wetlands exhibit high productivity. 3. Compare and contrast estuaries and intertidal pools in terms of biodiversity. 4. Explain how the open sea can be both an area of low average primary productivity and the largest contributor to the earth's overall net primary productivity. 5. Examine figure 8-17 on page 176 of the text. Consider why global warming is likely to cause a lessening of the amount of available freshwater and how that would likely cause changes throughout the downhill flow of freshwater.



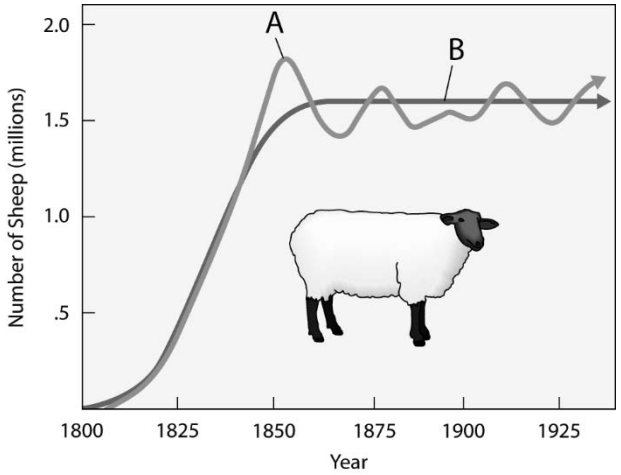
Use the Figure above to answer the following questions.

1. Choose the letter that represents when resources are not limiting and a population can grow at its intrinsic rate of increase.

2. Choose the letter that represents population size at which a population in a particular environment will stabilize when its supply of resources remains constant.

3. Choose the letter that represents limiting abiotic factors.

4. Choose the letter that represents a population's capacity for growth.



Use the Figure above to answer the following questions.

5. Choose the portion of the curve that results from reproductive time lag

6. Choose the portion of the curve that results from the biotic potential and environmental resistance.

CLIMASP COURSE SYLLABUS Environmental Microbiology

COURSE DESCRIPTION:

This course serves as a general introduction to the basic principles of applied and environmental microbiology. It introduces students

to the diversity of

microbial populations and their important roles in environmental processes in air, water, soils, and sediments. The course also covers the ecology and diversity of microbial communities in soil, water, and air and how microbial activities sustain natural ecosystems and the applications of microorganisms to solve environmental problems and public health. Topics will include wastewater treatment, bioremediation, biofilm engineering, and other applications related to

public health, agriculture, food science, and industry

The course will also focus on the

Objectives:

This course discusses the basic microbial metabolic processes, thermodynamics of growth and energy generation, and genetic and metabolic diversity. Emphasis is placed on the application of these concepts to biogeochemical cycling, subsurface microbiology, wastewater microbiology,

pollutant degradation,

microbial ecology, global warming and infectious diseases.

SIMA TOKAJIAN-Environmental Microbiology

Learning Outcomes

□

□ □

95. Know the presence and effects of microorganisms on different (environment. (
96. Know the various techniques of isolation of microorganisms. (
97. Understand the role of microbes in the soil (
98. Understand the sources and analysis of water. (
99. Understand eutrophication as resulting from water pollution by algae. (
100. Know the various types of water borne diseases and their causative (agents. (

101. Understand the sources and effects of air pollutants. (

102. Understand the geochemical roles and importance of heterotrophs and (autotrophs (**Course Resources** (1. **EnvironmentalMicrobiology**.SecondEdition,Editedby:IanL.Pepper, Charles P. Gerba, Terry Gentry and Raina M. Maier. 2009 Elsevier Inc. (

 Demonstrate that microorganisms have an indispensable role in the environment, including elemental cycles, biodegradation, etc.

Define the important microbes involved in environmental microbiology

 Identify the key roles played by microbes in the aquatic and terrestrial environment including soil structure, element cycles, metal extraction and human health.

Evaluate the effects of these microbes on human activities.

Discuss the role of microorganisms in the remediation of the environment.

2. **Environmental Microbiology**, 2nd Edition. Ralph Mitchell and Ji-Dong Gu. 2010 Wiley-Blackwell.

Course Schedule

Week	Date	Topic
1		Introduction to Environmental Microbiology
2		Bacterial Growth
3 +4		Bacterial Communities in Natural Ecosystems
4+5		Microbiology of Soil

5+6

Microbiology of Water

7+8

Microbiology of Air

9+10

Biogeochemical Cycling

10+11

Wastewater Treatment

12+13

Domestic and Indoor Microbiology

14

Course Policies

Policy on Cheating and Plagiarism

Students caught cheating on an exam receive a grade of zero on the exam in their first cheating attempt and receive a warning. Students caught cheating for the second time will receive a grade of “F” in the course and another warning. Plagiarism on assignments and project work is a serious offense. If plagiarism is detected, a student will be subject to penalty, similar to the cheating case, which ranges from receiving a zero on the assignment concerned to an “F” in the course in addition to a warning.

Attendance Policy

- Studentsareheldresponsibleforallthematerialpresentedintheclassroom, even during their absence.
- Studentscanmissnomorethantheequivalentoffiveweeksofinstruction and still receive credit for that course.
- Instructorshavetherighttoimposespecificattendanceregulationsintheir courses, provided that the

above-stated limit of absences is not exceeded, and the minimum number of absences allowed is no fewer than the equivalent of two weeks of classroom instruction, after the Drop and Add period.

- InstructorswillinformtheDepartmentsChairpersonandtheGuidanceOffice, of any prolonged unexplained absence.

- Studentswhoexceedtheallowednumberofabsencesmustwithdrawfrom the course; otherwise, the course grade will be recorded as “F” (NP).

Withdrawal Policy

“Students wishing to withdraw from one or more courses must follow the withdrawal procedure provided by the Registrar’s Office. Students withdrawing from courses after the late registration period and before the withdrawal deadline will receive Ws for all the courses in progress.” ***Deadline for withdrawal from courses***:

SIMA TOKAJIAN-Environmental Microbiology

Module 1

Introduction to Environmental Microbiology

Overview

Introduce students

to important microorganisms that are involved in

environmental microbiology and describe their impact on human.

Aim

Defines the important microorganisms that are involved in environmental microbiology, the nature of the different possible environments in which they are situated, and the possible effects of microorganisms on human activities.

Learning Outcomes

Define microorganisms involved in environmental microbiology (

Describe the nature of the different environments (

Explain the impact of microorganisms on human and on natural (habitats (

Units

1.1 Environmental Microbiology 1.2 Eubacteria and Archaea 1.3 Fungi and Protozoa 1.4 Slime Molds

1.5 Algae 1.6 Viruses

Module 2

Bacterial Growth

Overview

Define bacterial growth, describe the different stages and its relevance with growth in the environment.

Aim

Learning Outcomes

Bacterial growth is a complex process that involves numerous anabolic and catabolic reactions, which result in cell division. This module describes the various stages of bacterial growth under pure culture conditions and its relevance with growth in the environment.

- Define the factors that regulate bacterial growth and metabolism (
- Identify the phases of the typical bacterial growth pattern (
- Discuss bacterial spore formation and germination and the (conditions under which each might occur (
- Explain bacterial replication (
- Describe the formation of biofilms (
- Explain factors which influence bacterial growth under laboratory (conditions e.g. pH, temperature, moisture, nutrient requirements (etc. (

- Draw and explain the bacterial growth curve. (
- Explain types of culture media (
- Identify examples of various bacteriological media (
- Explain the preparation and storage of various bacteriological (media. (

Units

2.1 Growth in a pure culture in a flask 2.2 Continuous culture 2.3 Growth in the environment

SIMA TOKAJIAN-Environmental Microbiology

Module 3	**Bacterial Communities in Natural Ecosystems**
Overview	Introducing students to bacterial communities and importance of bacterial diversity
Aim	Complex bacterial communities are found in essentially all natural ecosystems including soils, plants, and surface and ground water. This module describes the microbial communities and diversity in natural systems, functional diversity and

	resilience of bacterial communities, and importance of microbial communities as source of natural
	products.
Learning Outcomes	Explain interconnections between microdiversity, genomic diversity and metabolic potential. (Understand the ecological role or impact of microbes and microbial diversity as they relate to individuals, populations of microbes and multicellular organisms, earth systems and the biosphere. (
Units	3.1 Bacterial diversity in natural systems 3.2 Functional diversity and the resilience of bacterial communities

Module 4

Microbiology of Soil

Overview

Introducing students to the role of microorganisms in the soil environment and a basic information about the known possibilities of soil remediation.

Aim

Learning Outcomes

Characteristics of the soil environment, microbial and fauna of soil, microbial activities in soil, nitrogen cycle, carbon cycle, mineral transformation by microorganisms, ecological relationship among the soil pathogens, effect of pesticide of peptides on soil microorganisms, biodegradation and biofuel generation, effect of physical properties of soil pathogens, aspect of biogeochemical cycles.

Describe the microbial flora of the soil. (

Understand the characteristics of soil environment and factors (affecting presence and activities

of microorganisms in the soil (

Describe ecological relationship among soil microorganisms (

 Describe the structure and microbial content of soil and the activities of rhizosphere microorganisms.

Units

4.1 Soil as a microbial environment 4.2 Distribution of microorganisms in soil 4.3 Bacterial diversity in soil 4.4 Metabolism of microorganisms in soil 4.5 Interaction with the rhizospheres

SIMA TOKAJIAN-Environmental Microbiology

Module 5	**Microbiology of Water**
Overview	Give students key information about microorganisms living in potable and polluted water, diseases, indicators and transmission.

Aim	This module will help students to gain knowledge about the microbiology of water supply, microbial flora of surface and ground waters, water treatment, water supply and public health, properties of potable and polluted water and microorganisms living in polluted water.
Learning Outcomes	Identify the major components of aquatic communities. (List the properties of the aquatic environment. (Explain the properties of potable/polluted water. (Explain the various indices of water pollution. (
Units	5.1 Microbial habitats in aquatic environments 5.2 Distribution of microorganisms in water 5.3 Microbial ecology of aquatic habitats 5.4 Pollution and disease transmission in water 5.5 Microbiological examination of water

Module 6

Microbiology of Air

Overview

Introducing students to air pollutants, effects and methods of control.

Complex bacterial communities are found in essentially all natural

Aim

specificity of prevalent environmental conditions acting in the air and their influence on survival of microorganisms. Describe air pollutants due to chemicals and microbial processes and the threat associated with

biological aerosols.

ecosystems. This module helps students to understand the

Learning Outcomes

Explain air pollutants due to chemical and microbial processes (

Identify the microbial indicators used in monitoring air pollution (

List the effects of air pollutants on man, plants and animals. (

Describe the methods of controlling air pollution. (

Units

6.1 Microbial survival and diversity in air 6.2 Airborne pathogens 6.3 Aerosols and chemical pollutants 6.4 Bioaerosol control

SIMA TOKAJIAN-Environmental Microbiology

Module 7

Biogeochemical Cycling

Overview

Introducing students to

Learning Outcomes

nitrogen, sulfur, and iron.

biogeochemical cycles pertaining to carbon,

Aim

This module discusses the biogeochemical cycles pertaining to carbon, nitrogen, sulfur, and iron. Understand the carbon cycle, which involves circulation of carbon between reservoir and sink, through photosynthesis, respiration, degradation of organic compounds, and burning of fossil

fuels. Describes nitrogen cycle and nitrogen fixation through microbial activities and gives an overview on many other

important biogeochemical cycles.

Describe carbon cycle, microbial degradation of cellulose, hemicelluloses, lignin and chitin (

Describe nitrogen cycle, nitrogen fixation, ammonification, nitrification, denitrification and nitrate reduction (

Describe phosphorus cycle, phosphate immobilization and solubilisation (

Describe sulphur cycle, microbes involved in sulphur cycle (

Understand other elemental cycles: Iron and manganese (

Units

7.1 Carbon cycle 7.2 Nitrogen cycle 7.3 Sulfur cycle 7.4 Other cycles

Module 8

Wastewater Treatment

Overview

Highlight that the

primary goal of wastewater treatment is the removal

and degradation of organic matter under controlled conditions

Aim

This module describes the treatment of wastewater. Students will understand that the amount of organic matter in domestic wastes determines the degree of required biological treatment and will learn the various tests that are used to assess the amount of organic matter: biochemical oxygen demand (BOD), chemical oxygen demand (COD), and total organic carbon (TOC). The module also describes the complete sewage treatment, which is comprised of three major steps:

primary, secondary, and tertiary treatment.

Learning Outcomes

Describe the importance of indicator organisms, and explain how total coliforms are detected (

Compare and contrast primary treatment, secondary treatment, advanced treatment, and

anaerobic digestion. (

Describe liquid waste management (BOD and COD) (

Units

8.1 Wastewater treatment 8.2 Oxidation ponds 8.3 Septic tanks 8.4 Pathogens of concern

SIMA TOKAJIAN-Environmental Microbiology

Module 9

Domestic and Indoor Microbiology

Overview

Indoor environments including home, schools, workplaces, and

hospitals act as reservoirs of human pathogens.

Aim

This module provides an overview of the household and indoor sources of pathogens, their fate, and transport within the indoor environment. Students will learn that household sources of pathogens include air, food, water, and fomites and that microbial airborne pathogens can occur as bioaerosols. In addition the module highlights that food products that contain pathogens can result in human infections within

households.

Learning Outcomes

Describe the household sources of pathogens (

Identify indoor pathogens (

Define the role of fomites in disease spread (

Explain transfer of pathogens (

Units

9.1 Household sources of pathogens 9.2 Fomites role in disease spread 9.3 Transfer of pathogens

Module 10

Global Change and Microbial Infectious Diseases

Overview

Human activity directly affects the magnitude of exposure to

Learning Outcomes

environmental pathogens.

Aim

This module discusses the influence of both indigenous environmental and animal-borne pathogens on human health and infectious diseases. It also highlights the correlation between global warming and mechanisms enhancing spread of infectious disease. Urbanization and deforestation can also result in increased contact between humans and

can have a role in the increase of infectious agents.

Understand how human activities affect the magnitude of exposure to environmental pathogens (

Describe the correlation between global warming and spread of infectious diseases (

Understand the role of urbanization and deforestation in enhancing the contact between humans and infectious agents (

Units

10.1 10.2 10.3

Environmental human pathogenic microbes Routes of Exposure

Environmental change and microbial infectious diseases

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Course Syllabus

ENS 201:
Introduction to Environmental Science
Notre Dame University-Louaize, Faculty of Natural and Applied Sciences, Department of Sciences

Fall Semester, 2014-2015

Instructor Information

Instructor:	Dr. Tanos G. Hage
Office Location:	S242, Main Campus
Telephone:	Office – 09-208725
Office Hours:	MWF 1:00-2:00
E-mail:	thage@ndu.edu.lb
Website:	

Course Identification

Course Number:	ENS 20
Course Name:	Introduction to Environmental Science
Course Location:	Main Campus

Class Times: MWF 3:00-4:00
Prerequisites: None
Faculty Web Page: http://www.ndu.edu.lb/academics/fnas/deanmess.htm

Course Description/Overview

The course introduces the students to basic ecological principles followed by a focus on specific current global and regional environmental problems, their causes, effects and possible solutions. Emphasis will be on pollution, conservation and a proper use of energy resources.

Course Learning Objectives

The overarching objectives of this course are: a) Explore the basic ecological and environmental principles that explain how life on earth is sustained for billions of years. b) Use the scientific foundations gained from the previous objective in order to understand the environmental problems facing our , like global climate change, and evaluate possible solutions to these problems. c) Emphasize the importance of the concept of sustainability –the integrating theme in this course- in understanding and finding possible solutions to our environmental problems.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Understand how living organisms acquire and use nutrients and energy by studying principles of ecology.
2. Examine the global distribution of biomes and threats by human activities, including global warming and climate change, due to unsustainable practices.
3. Learn about the exponential growth of human population and its impact on the environment.
4. Discuss the availability of food and prevalence of hunger and sustainable food production practices.
5. Understand the basics of environmental health to understand the risks we are facing and what can we do about them.
6. Evaluate the benefits of biodiversity, and identify threats and conservation practices associated with it.

7. Understand how the climate work and examine the evidence for climate change and its consequences.
8. Know the sources and major types of air pollution.
9. Understand the role of water, its use and management
10. Survey the causes and effects of water pollution on the ecosystem
11. Explore our options to find sustainable and environmentally friendly ways to meet our energy needs and help mitigate the effects of climate change.
12. Discuss the nature of solid, hazardous and toxic waste and explore how to sustainably shrink the waste stream.
13. Understand the concept of ecological economics and explore whether development can be sustainable

Course Resources

Required Text Book

Cunningham W. P, M. A. Cunningham, B. W. Saigo. 2010. Environmental Science: A Global Concern , 11th ed. McGraw-Hill Inc., NY, USA
Insert the list of required course texts with full bibliographic references)

Additional References

Daniel B. Botkin, Edward A. Keller, Environmental science: Earth as a living planet, **(Shelf mark: 363.7 B7495e5; NDU Main Library)**

Stanley E. Manahan, Environmental science and technology: a sustainable approach to green science and technology, **(Shelf mark: 628. M2669e2; NDU Main Library)**

Lara, H. Debs, Pascale C. Saad, Green Lebanon - the book: the must-see forests of Lebanon, **(Shelf mark: 333.75 H2432; NDU Main Library)**

Albia Watanmia**, (**Journal: Environment and Development)**, (Print Serial NDU Main Library)**
Ministry of Environment: http://www.moe.gov.lb/Pages/MOE%20Home.aspx

Association for Forests, Development, and Conservation: http://www.afdc.org.lb/publication.php

The International Union for Conservation of Nature: http://www.iucn.org/

Assignments and Grading Scheme

The University uses the following system of grades. This system consists of letter grades with their corresponding numerical ranges (*i.e.* percentage equivalent, and the 4.0 point maximum).

Grade	Description	Quality Point Value	Percentage Equivalent
A^+	Outstanding	4.0	97-100
A	Excellent	4.0	93 - 96
A^-	Very Good	3.7	89 - 92
B^+	Good	3.3	85 - 88
B	Good	3.0	80 - 84
B^-	Good	2.7	77 - 79
C^+	Satisfactory	2.3	73 - 76
C	Satisfactory	2.0	70 - 72
C^-	Passing	1.7	66 - 69
D^+	Passing	1.3	63 - 65
D	Lowest Passing	1.0	60 - 62
F	Failure	0.0	0 - 59
UW	Unofficial Withdrawal	0.0	

The grade "*UW*" is assigned by the instructor when a registered student has never attended a class or has ceased attending and has not submitted an official course withdrawal request to the Office of the Registrar. This grade is computed as an *F* grade in the grade-point average.

Grading Policy

Grades can be based on the following: (Example)

First exam	25%
Second exam	25%
Final Exam	35%
Project and Assignments	10%
Participation and Evaluation	05%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

Classes are a mix of lectures (Powerpoint presentations) and class discussions. The material related to course is presented in a clear manner that engages the students by relating abstract concepts to current everyday issues or controversies that they care about. Material and assignments will be posted on blackboard. Additional readings will be assigned from the literature on specific subjects. Field trip(s) will be planned to visit a natural wild area in Lebanon. You should record all your observations, thoughts and questions in your field journal. Your field observations will be unique to you, reflecting your personal style. For each field trip a report is expected. Includes photos and sketches with your write up.

Course Schedule

Weeks	**Topics**
Week 1	Syllabus explanation Topic 1: Understanding our environment
Week 2	Topic 1: Understanding our environment Topic 2: Matter, Energy and life
Week 3	Topic 2: Matter, Energy and life
Week 4	Topic 3: Terrestrial biomes and aquatic ecosystems
Week 5	Topic 4: Biodiversity
Week 6	Topic 4: Biodiversity Topic 5: Human populations
Week 7	Topic 5: Human populations Topic 6: Food and agriculture
Week 8	Topic 6: Food and agriculture Topic 7: Environmental health and toxicology
	Exam I: Topics 1-6

Week 9	Topic 7: Environmental health and toxicology
Week 10	Topic 8: Air, weather and climate
Week 11	Topic 9: Air pollution and ozone depletion
Week 12	Topic 10: Water use and management
	Exam II: Topics 7-9
Week 13	Water pollution
Week 14	Solid and hazardous waste Managemenr
Week 15	Ecological economy
Week 16	What then shall we do?

Course Policies
No make-up exam is allowed under normal circumstances. Consequently, a student missing an exam with no justifiable reason will lose the grade value of that exam.
Under abnormal circumstances a student is allowed a make-up exam under the following conditions:
1. The student shows that missing the exam was beyond his/her control.
2. The instructor and chairperson accept the case presented and approve of the make up.
3. The student may lose 10 points out of 100 of the grade value of the exam in question.
4. The make up exam shall be done within 10 days after the elapse of the exam date.

Assignments should be returned by the due date. Failure to do so will result in losing up to 20% of the grade.

Mobile phones should be turned off and out of sight (i.e. not face-up on the desk but preferably inside purses, backpacks, briefcases, etc. or face down on the desk). Phones may not be answered.

Students must attend class with the required material (i.e. original textbook, notebook, pens, etc.).

Once in class, students are expected to remain in class for the entire period.

English must be the only language spoken in class at all times.

Special needs: Any student who feels s/he may need an accommodation due to a disability should contact the instructor privately to discuss those specific needs.

Policies & Procedures

NDU's Attendance Policy
Student should attend all classes and laboratory sessions on time. A pattern of absences, whether authorized or not, and even below the maximum number (specified below), may alter one's grade substantially. The SAO alone authorizes absences. No absence absolves a student from the responsibility of acting upon the material presented during his/her absence. The maximum number absences for classes that meet on

MWF is six; the maximum number for classes that meet on TTh and in the summer is four, (or two hours per credit course). Any student whose absences exceed the maximum limits shall automatically fail the course unless the student withdraws.

Office Hours: All instructors at NDU are available for office hours during the week. Please note the office hour that your instructor has dedicated to this course to make an appointment. Just dropping by may not ensure that the professor has set aside time to assist you. Office hours may be used ideally to ask for guidance on an assignment or to ask questions concerning a subject that you were not clear on during class time.

NDU's Academic Integrity Policy

Students are expected and encouraged to be honest and to maintain the highest standards of academic integrity in their academic work and assignments at the University. They shall refrain from any academic dishonesty or misconduct including; but not limited to:

- Plagiarism; that is, the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Also, paraphrasing, summarizing, as well as well as direct quotations are considered as plagiarism, if the original source is not properly cited.
- Cheating.
- Assisting in cheating.
- Substituting a student in the taking of an examination.
- Substituting examination booklets.
- Submitting the same work for more than one course and the like. o Submitting papers written by others.
- Receiving or providing unauthorized help or assistance in any academic work or assignment. Intentional violation of program and degree requirements and regulation as established by the University.
- Dishonest reporting of computational, statistical, experimental, research, results, or the like.

Course	Introduction to Environmental Science
Module 1	Humans and sustainability: an overview
Key Concepts	Principles of sustainability, ecological footprints, Population growth, Poverty, sustainable society.
Overview	Nature has sustained itself for billions of years by relying on solar energy, biodiversity and nutrient cycling. Our survival is dependent on the energy from the sun and natural capital (natural resources and natural services). As our ecological footprint grows, we are depleting and degrading the earth's natural capital. Humans are creating environmental problems mainly due to wasteful and unsustainable resource use. Living sustainably means living off the earth's natural income without depleting or degrading the natural capital it provides.
Aim	The overriding aim of this module is to understand how our ecological footprints affecting the earth and how to live in an environmentally sustainable society.
Learning Outcomes	At the end of this module learners will be able to: • Know the three principles of sustainability. • Understand the concept of ecological footprint. • Recognize the major causes of environmental problems. • Explain the concept of an environmentally sustainable society.
Units	Unit 1.1 The three principles of sustainability. Unit 1.2: How our ecological footprints affecting the earth. Unit 1.3: Major environmental problems. Unit 1.4: Environmentally sustainable society.
Readings	Clark,W.C. (2001) A transition toward sustainability. Ecology Law Quarterly 27:1021.

	Jones, K., Scholtz, A. And Lehmer, G. Rio+10: Let the people be heard. Earth Island Journal 17:12. Louis P. Pojman and Paul Pojman (2012) *Environmental Ethics: Readings in Theory and Applications*, Sixth edition. Wadsworth, Cengage Learning. USA.
Activity	Assignment 1. Write a two-page scenarios describing what your life and that of any children you choose to have might be like 50 years from now if (a) we continue on our present path or (b) we shift to more environmentally sustainable societies throughout most of the world. 2. What are the major resource and environmental problems facing the town where you live? Which of these problems affect you directly? Have these problems gotten better or worse during the past 5 years? 3. Explain why you agree o disagree with the following propositions: a. Stabilizing population is not desirable because, without more consumers, economic growth would stop. b. The world will never run out of resources because we can use technology to find substitutes and to help us reduce resource waste
Module 2	Science, ecological principles, and sustainability
Key Concepts	Matter, energy, ecosystems, biodiversity and evolution, climate and biodiversity.
Overview	This module looks at how the laws of conservation of matter and the laws of thermodynamics affect living organisms. The lesson learned from this module

	is that we cannot violate these laws of nature that place limits on what we we can do with matter and energy resources. The principles of sustainability are emphasized in this module.
Aim	The overriding aim of this module is to understand the how the basic laws of matter and thermodynamics, in addition the principles of sustainability, applies to living organisms.
Learning Outcomes	At the end of this module learners will be able to: • Understand the laws of conservation of matter and the laws of thermodynamics and their applications to living organisms. • Recognize the major components of ecosystems and how life on earth is sustained. • Evaluate the importance of biodiversity. • Know the effects of climate on biodiversity. • Evaluate the human impacts on the environment including climate change.
Units	Unit 2.1: Science, matter, energy, and systems. Unit 2.2: Ecosystems: what are they and do they work? Unit 2.3: Biodiversity and evolution. Unit 2.4: Biodiversity: Species interactions, and population control. Unit 2.5: Climate and biodiversity. Unit 2.6: The human populations and its impact.
Readings	Pauly, D., Christensin, V. froese, R., and Palomares (2000) Fishing down aquatic food webs. American Scientist 88: 46. Lockaby, B. G., and Conner, W. H. (1999) N:P balance in wetland forests: productivity across a biogeochemical continuum. The Botanical Review 65:171.

	Becker, L., (2002) Repeated blows: Did extraterrestrial collisions capabl of causing widespread extinctions pound the earth not once, but twice-or even several times? Scientific American 286: 76. Peterson, A. T., Vieglais (2001) Predicting species invasions using ecological niche modeling: New approaches from bioinformatics attack a pressing problem. Bioscience 51: 363. Del Tredici, P. (2001) Sprouting in temperate trees: A morphological and ecological review. The Botanical Review 67:121. Beyers, J.E. (2000) Competition between two estuarine snails: Implications for invasions of exotic species. Ecology 81:1225.
Activity	**Overview**
	Assignment 1- How has the climate changed in your area where you live during the past 50 years? Investigate the beneficial and harmful effects of these changes? How have these changes benefited or harmed you personally? 2- What type of biome do you live in? What have been the major effects of human activities over the past 50 years on the characteristic vegetation and animal life normally found in the biome you live in? How is your own lifestyle affecting this biome? 3- Visit a local forest, pond or lake, choose a particular organism, and then use

	the library or the internet to describe as much as you can about its niche, including what species it depends on and what species help support its survival. Predict what might happen if your selected species disappeared from the local environment. 4- How would you respond to someone who says that because extinction is a natural process, we should not worry about the loss of biodiversity? 5- In what ways do humans occupy generalized niches and in what way do they occupy specialist niches?
Module 3	Sustaining Biodiversity
Key Concepts	Extinction of species, threats to ecosystems, sustaining sustaining biodiversity
Overview	This module focuses on the role of humans in the extinctions of species, and the impact of species extinction on humans and the environment. Emphasis will be placed on how we can protect wild species from extinction. In addition, sustaining forests and biodiversity are two topics that are discussed in details.
Aim	The aim of this module is to explore the problem of species extinction and the best practices to sustain biodiversity.
Learning Outcomes	At the end of this module students will be able to: • Know the role of humans in the extinction of species. • Evaluate the risks resulting from the rising rate of species extinction. • Recognize the best practices to protect wild species from extinction. • Know the major threats to forest ecosystems. • Understand the ecosystem approach to sustaining biodiversity.

Units	Unit 3.1: What role do humans play in the extinction of species? *Unit 3.2: Why should we care about the rising rate of species extinction?* Unit 3.3: How can we protect wild species from extinction? Unit 3.4: What are the major threats to forest ecosystems? Unit 3.5: Climate change can threaten forest ecosystem Unit 3.6: How should we manage and sustain biodiversity?
Readings	Levin, D. (2002) Hybridization and extinction: In protecting rare species, conservationists should consider the dangers of interbreeding, which compound the more well known threats to wildlife. American Scientist 90: 254. Matthews, M. (2002) When fire and forest health came to town: The forest service hopes its national fire plan can restore woodland while benefitting local economies. American Forests 107: 25. Helmuth L. (1999) Can this swamp be saved? Science News 155: 252.
Activity	
	Assignment 1- Identify examples of habitat destruction or degradation in your community that have had harmful effects on the populations of various wild plants and animal species. Develop a management plan for rehabilitating these habitats and species. 2- Choose a particular endangered animal or plant species and use the library or

	the internet to find out what is being done to protect it from extinction. Develop a protection plan for this species. 3- If ecosystems are undergoing constant change, why should we (a) establish and protect nature reserves and (b) carry out ecological restoration?S 4- Should there be a ban on the use of of-road vehicles and snowmobiles on all public land in Lebanon?
Module 4	Sustaining Natural Resources
Key Concepts	Soil and food, Pest management, water resources, mineral resources, renewable and nonrenewable energy.
Overview	The focus of this module is on natural resources that are necessary to sustain living organisms. We start with the discussion of soil as precious resources upon which agriculture is dependent, water resources, mineral resources in addition to renewable and non-renewable energy.
Aim	The aim of this module is to explore the natural resources necessary to sustain life.
Learning Outcomes	At the end of this module learners will be able to: • Discuss food security and why is it difficult to attain? • Evaluate environmental problems arising from industrialized food production. • Discuss sustainable agriculture. • Explore the importance of mineral resources. • Discuss the various forms of renewable and non-renewable energy resources.
Units	Unit 4.1: Food, soil and pest management Unit 4.2: Water resources

	Unit 4.3: Nonrenewable mineral resources energy resources. Unit 4.4: Nonrenewable energy Unit 4.5: Renewable energy and energy efficiency
Readings	Snell, M. B. (2001) Against the grain. Sierra 86:30 Finneran, K. (2001) What's food got to do with it? Issues in Science and Technology. Kerlin, K. (2001) Diamonds aren't forever E 12:54. Nanney, J. (2002) How motor efficiencies affect system desgns. Plant Engineering. Fairley, P. (2002) wind power for pennies: A light weight wind turbine is finally on the horizon and it just might be the breakthrough Technology Review 105:40.
Activity	**Overview**
	Assignment 1- What could happen to energy intensive agriculture in the industrialized countries if world oil prices rose sharply? 2- Why should it matter to people in developed countries that many people in developing countries are malnourished and hungry? What are the three most important actions in you believe should be taken to reduce hunger (a) in Lebanon (b) in the world?

	3- Develop a water conservation plan for your school and submit it to school officials. 4- How do human activities increase the harmful effects of prolonged drought? How can we reduce these effects? 5- Write a two-page scenario of what your life might be like without oil. Compare and discuss the scenarios developed by your class. 6- Make a study of energy use in your school and use the findings to develop an energy-efficiency improvement program. Present your plan to school officials.
Module 5	Sustaining Environmental Quality
Key Concepts	Air pollution, water pollution, Solid and hazardous waste, Climate change, and ozone depletion.
Overview	This module deals with aspects related to the quality of our environment. Humans are utilizing matter and energy at an exceedingly fast rate. This is creating problems of depletion of natural resources and environmental pollution. In this module we are going to discuss aspects related to water and air pollution and solid and hazardous waste management. We will emphasize global problems of climate change and ozone in our discussion.
Aim	The overriding aim of this module is to discuss several aspects related to the degradation of the environmental quality resulting from overuse of natural resources and energy.
Learning	At the end of this module learners will be able to:

Outcomes	• Know outdoor and indoor air pollution • Discuss acid deposition. • Recognize health effect of air pollution. • Discuss how the earth's temperature and climate change in the future. • Discuss the possible effects of a warmer atmosphere. • Discuss what can be done to slow projected climate change. • Recognize the problem and solutions to ozone depletion. • Discuss causes and effects of water pollution. • Discuss the problem and solutions to solid and hazardous waste
Units	Unit 5.1: Air pollution Unit 5.2: Climate change and ozone depletion Unit 5.3: Water pollution Unit 5.4: Solid and hazardous waste
Readings	Becker, R. and Henderson, V. (2000) Effects of air quality regulations on polluting industries. Journal of Political Economy 108:379. UNEP. (2013) *Climate Change* http://www.unep.org/pdf/UNEP_Profile/Climate_change.pdf Pacala, S., Socolow, R. (2004) Stabilization wedges: Solving the climate problem for the next 50 years with current technologies. Science 505:968-72. Rabalais, N, N., Turner, R. E., Scavia, D., (2002) Beyond science into policy: Gulf of Mexico hypoxia and the Mississippi River. BioScience 52:129.

	Evans, L. D. (2002) The dirt on phytoremediation. Journal of Soil and Water Conservation 57:13.
Activity	**Overview**
	Assignment 1- Congratulations! You are in charge of reducing air pollution in Lebanon. List the three most important features of your policy. 2- Suppose you become trapped in your car during a snowstorm and you have your engine and heater running to keep warm. Explain why you should roll down one of your windows just a little. 3- Do you agree or disagree with the argument by developing countries that developed countries should bear the brunt of reducing CO2 emissions because they produce much more of these emissions than developing countries? Explain. 4- Explain why developed nations are able to adapt to problems caused by increased global warming more easily than developing countries. Should developed countries provide significant aid to help developing countries adapt to the harmful effects of global warming? Explain. 5- Congratulations! You are in charge of the world. List your three most important actions for dealing with (a) global warming and climate change, (b) depletion of ozone in the stratosphere.

	6- How can a stream cleanse itself of oxygen-demanding wastes? Under what conditions will this natural cleansing system fail? 7- What hazardous wastes are produced (a) at your school and (b) in your community? What happens to these wastes?

Course Syllabus

ENS 201:

Introduction to Environmental Science

Notre Dame University-Louaize, Faculty of Natural and Applied Sciences, Department of Sciences

Fall Semester, 2014-2015

Instructor Information

Instructor:	Dr. Tanos G. Hage
Office Location:	S242, Main Campus
Telephone:	Office – 09-208725
Office Hours:	MWF 1:00-2:00
E-mail:	thage@ndu.edu.lb

Website:

Course Identification

Course Number:	ENS 20
Course Name:	Introduction to Environmental Science
Course Location:	Main Campus
Class Times:	MWF 3:00-4:00
Prerequisites:	None
Faculty Web Page:	http://www.ndu.edu.lb/academics/fnas/deanmess.htm

Course Description/Overview

The course introduces the students to basic ecological principles followed by a focus on specific current global and regional environmental problems, their causes, effects and possible solutions. Emphasis will be on pollution, conservation and a proper use of energy resources.

Course Learning Objectives

The overarching objectives of this course are: a) Explore the basic ecological and environmental principles that explain how life on earth is sustained for billions of years. b) Use the scientific foundations gained from the previous objective in order to understand the environmental problems facing our , like global climate change, and evaluate possible solutions to these problems. c) Emphasize the importance of the concept of sustainability –the integrating theme in this course- in understanding and finding possible solutions to our environmental problems.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

14. Understand how living organisms acquire and use nutrients and energy by studying principles of ecology.
15. Examine the global distribution of biomes and threats by human activities, including global warming and climate change, due to unsustainable practices.

16. Learn about the exponential growth of human population and its impact on the environment.
17. Discuss the availability of food and prevalence of hunger and sustainable food production practices.
18. Understand the basics of environmental health to understand the risks we are facing and what can we do about them.
19. Evaluate the benefits of biodiversity, and identify threats and conservation practices associated with it.
20. Understand how the climate work and examine the evidence for climate change and its consequences.
21. Know the sources and major types of air pollution.
22. Understand the role of water, its use and management
23. Survey the causes and effects of water pollution on the ecosystem
24. Explore our options to find sustainable and environmentally friendly ways to meet our energy needs and help mitigate the effects of climate change.
25. Discuss the nature of solid, hazardous and toxic waste and explore how to sustainably shrink the waste stream.
26. Understand the concept of ecological economics and explore whether development can be sustainable

Course Resources

Required Text Book

Cunningham W. P, M. A. Cunningham, B. W. Saigo. 2010. Environmental Science: A Global Concern , 11th ed. McGraw-Hill Inc., NY, USA
Insert the list of required course texts with full bibliographic references)

Additional References

Daniel B. Botkin, Edward A. Keller, Environmental science: Earth as a living planet, (**Shelf mark: 363.7 B7495e5; NDU Main Library)**

Stanley E. Manahan, Environmental science and technology: a sustainable approach to green science and technology, (**Shelf mark: 628. M2669e2; NDU Main Library)**

Lara, H. Debs, Pascale C. Saad, Green Lebanon - the book: the must-see forests of Lebanon, **(Shelf mark: 333.75 H2432; NDU Main Library)**

Albia Watanmia**, (**Journal: Environment and Development)**, (Print Serial NDU Main Library)**
Ministry of Environment: http://www.moe.gov.lb/Pages/MOE%20Home.aspx

Association for Forests, Development, and Conservation: http://www.afdc.org.lb/publication.php

The International Union for Conservation of Nature: http://www.iucn.org/

Assignments and Grading Scheme

The University uses the following system of grades. This system consists of letter grades with their corresponding numerical ranges (*i.e.* percentage equivalent, and the 4.0 point maximum).

Grade	Description	Quality Point Value	Percentage Equivalent
A^{+}	Outstanding	4.0	97-100
A	Excellent	4.0	93 - 96
A^{-}	Very Good	3.7	89 - 92
B^{+}	Good	3.3	85 - 88
B	Good	3.0	80 - 84
B^{-}	Good	2.7	77 - 79
C^{+}	Satisfactory	2.3	73 - 76
C	Satisfactory	2.0	70 - 72
C^{-}	Passing	1.7	66 - 69
D^{+}	Passing	1.3	63 - 65
D	Lowest Passing	1.0	60 - 62
F	Failure	0.0	0 - 59
UW	Unofficial Withdrawal	0.0	

The grade "*UW*" is assigned by the instructor when a registered student has never attended a class or has ceased attending and has not submitted an official course withdrawal request to the Office of the Registrar. This grade is computed as an *F* grade in the grade-point average.

Grading Policy

Grades can be based on the following: (Example)

First exam	25%
Second exam	25%
Final Exam	35%
Project and Assignments	10%
Participation and Evaluation	05%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

Classes are a mix of lectures (Powerpoint presentations) and class discussions. The material related to course is presented in a clear manner that engages the students by relating abstract concepts to current everyday issues or controversies that they care about. Material and assignments will be posted on blackboard. Additional readings will be assigned from the literature on specific subjects. Field trip(s) will be planned to visit a natural wild area in Lebanon. You should record all your observations, thoughts and questions in your field journal. Your field observations will be unique to you, reflecting your personal style. For each field trip a report is expected. Includes photos and sketches with your write up.

Course Schedule

Weeks	**Topics**
Week 1	Syllabus explanation Topic 1: Understanding our environment
Week 2	Topic 1: Understanding our environment Topic 2: Matter, Energy and life
Week 3	Topic 2: Matter, Energy and life
Week 4	Topic 3: Terrestrial biomes and aquatic ecosystems
Week 5	Topic 4: Biodiversity
Week 6	Topic 4: Biodiversity Topic 5: Human populations
Week 7	Topic 5: Human populations Topic 6: Food and agriculture
Week 8	Topic 6: Food and agriculture Topic 7: Environmental health and toxicology
	Exam I: Topics 1-6

Week 9	Topic 7: Environmental health and toxicology
Week 10	Topic 8: Air, weather and climate
Week 11	Topic 9: Air pollution and ozone depletion
Week 12	Topic 10: Water use and management
	Exam II: Topics 7-9
Week 13	Water pollution
Week 14	Solid and hazardous waste Managemenr
Week 15	Ecological economy
Week 16	What then shall we do?

Course Policies
No make-up exam is allowed under normal circumstances. Consequently, a student missing an exam with no justifiable reason will lose the grade value of that exam.
Under abnormal circumstances a student is allowed a make-up exam under the following conditions:
1. The student shows that missing the exam was beyond his/her control.
2. The instructor and chairperson accept the case presented and approve of the make up.
3. The student may lose 10 points out of 100 of the grade value of the exam in question.
4. The make up exam shall be done within 10 days after the elapse of the exam date.

Assignments should be returned by the due date. Failure to do so will result in losing up to 20% of the grade.

Mobile phones should be turned off and out of sight (i.e. not face-up on the desk but preferably inside purses, backpacks, briefcases, etc. or face down on the desk). Phones may not be answered.

Students must attend class with the required material (i.e. original textbook, notebook, pens, etc.).

Once in class, students are expected to remain in class for the entire period.

English must be the only language spoken in class at all times.

Special needs: Any student who feels s/he may need an accommodation due to a disability should contact the instructor privately to discuss those specific needs.

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MWF is six; the maximum number for classes that meet on TTh and in the summer is four, (or two hours per credit course). Any student whose absences exceed the maximum limits shall automatically fail the course unless the student withdraws.

Office Hours: All instructors at NDU are available for office hours during the week. Please note the office hour that your instructor has dedicated to this course to make an appointment. Just dropping by may not ensure that the professor has set aside time to assist you. Office hours may be used ideally to ask for guidance on an assignment or to ask questions concerning a subject that you were not clear on during class time.

NDU's Academic Integrity Policy

Students are expected and encouraged to be honest and to maintain the highest standards of academic integrity in their academic work and assignments at the University. They shall refrain from any academic dishonesty or misconduct including; but not limited to:

- Plagiarism; that is, the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Also, paraphrasing, summarizing, as well as well as direct quotations are considered as plagiarism, if the original source is not properly cited.
- Cheating.
- Assisting in cheating.
- Substituting a student in the taking of an examination.
- Substituting examination booklets.
- Submitting the same work for more than one course and the like. o Submitting papers written by others.
- Receiving or providing unauthorized help or assistance in any academic work or assignment. Intentional violation of program and degree requirements and regulation as established by the University.
- Dishonest reporting of computational, statistical, experimental, research, results, or the like.

Course	Introduction to Environmental Science
Module 1	Humans and sustainability: an overview
Key Concepts	Principles of sustainability, ecological footprints, Population growth, Poverty, sustainable society.
Overview	Nature has sustained itself for billions of years by relying on solar energy, biodiversity and nutrient cycling. Our survival is dependent on the energy from the sun and natural capital (natural resources and natural services). As our ecological footprint grows, we are depleting and degrading the earth's natural capital. Humans are creating environmental problems mainly due to wasteful and unsustainable resource use. Living sustainably means living off the earth's natural income without depleting or degrading the natural capital it provides.
Aim	The overriding aim of this module is to understand how our ecological footprints affecting the earth and how to live in an environmentally sustainable society.
Learning Outcomes	At the end of this module learners will be able to: • Know the three principles of sustainability. • Understand the concept of ecological footprint. • Recognize the major causes of environmental problems. • Explain the concept of an environmentally sustainable society.
Units	Unit 1.1 The three principles of sustainability. Unit 1.2: How our ecological footprints affecting the earth. Unit 1.3: Major environmental problems. Unit 1.4: Environmentally sustainable society.
Readings	Clark,W.C. (2001) A transition toward sustainability. Ecology Law Quarterly 27:1021.

	Jones, K., Scholtz, A. And Lehmer, G. Rio+10: Let the people be heard. Earth Island Journal 17:12. Louis P. Pojman and Paul Pojman (2012) *Environmental Ethics: Readings in Theory and Applications*, Sixth edition. Wadsworth, Cengage Learning. USA.
Activity	Assignment 1. Write a two-page scenarios describing what your life and that of any children you choose to have might be like 50 years from now if (a) we continue on our present path or (b) we shift to more environmentally sustainable societies throughout most of the world. 2. What are the major resource and environmental problems facing the town where you live? Which of these problems affect you directly? Have these problems gotten better or worse during the past 5 years? 3. Explain why you agree o disagree with the following propositions: a. Stabilizing population is not desirable because, without more consumers, economic growth would stop. b. The world will never run out of resources because we can use technology to find substitutes and to help us reduce resource waste
Module 2	Science, ecological principles, and sustainability
Key Concepts	Matter, energy, ecosystems, biodiversity and evolution, climate and biodiversity.
Overview	This module looks at how the laws of conservation of matter and the laws of thermodynamics affect living organisms. The lesson learned from this module

	is that we cannot violate these laws of nature that place limits on what we we can do with matter and energy resources. The principles of sustainability are emphasized in this module.
Aim	The overriding aim of this module is to understand the how the basic laws of matter and thermodynamics, in addition the principles of sustainability, applies to living organisms.
Learning Outcomes	At the end of this module learners will be able to: • Understand the laws of conservation of matter and the laws of thermodynamics and their applications to living organisms. • Recognize the major components of ecosystems and how life on earth is sustained. • Evaluate the importance of biodiversity. • Know the effects of climate on biodiversity. • Evaluate the human impacts on the environment including climate change.
Units	Unit 2.1: Science, matter, energy, and systems. Unit 2.2: Ecosystems: what are they and do they work? Unit 2.3: Biodiversity and evolution. Unit 2.4: Biodiversity: Species interactions, and population control. Unit 2.5: Climate and biodiversity. Unit 2.6: The human populations and its impact.
Readings	Pauly, D., Christensin, V. froese, R., and Palomares (2000) Fishing down aquatic food webs. American Scientist 88: 46. Lockaby, B. G., and Conner, W. H. (1999) N:P balance in wetland forests: productivity across a biogeochemical continuum. The Botanical Review 65:171.

	Becker, L., (2002) Repeated blows: Did extraterrestrial collisions capabl of causing widespread extinctions pound the earth not once, but twice-or even several times? Scientific American 286: 76. Peterson, A. T., Vieglais (2001) Predicting species invasions using ecological niche modeling: New approaches from bioinformatics attack a pressing problem. Bioscience 51: 363. Del Tredici, P. (2001) Sprouting in temperate trees: A morphological and ecological review. The Botanical Review 67:121. Beyers, J.E. (2000) Competition between two estuarine snails: Implications for invasions of exotic species. Ecology 81:1225.
Activity	**Overview**
	Assignment 1- How has the climate changed in your area where you live during the past 50 years? Investigate the beneficial and harmful effects of these changes? How have these changes benefited or harmed you personally? 2- What type of biome do you live in? What have been the major effects of human activities over the past 50 years on the characteristic vegetation and animal life normally found in the biome you live in? How is your own lifestyle affecting this biome? 3- Visit a local forest, pond or lake, choose a particular organism, and then use

	the library or the internet to describe as much as you can about its niche, including what species it depends on and what species help support its survival. Predict what might happen if your selected species disappeared from the local environment. 4- How would you respond to someone who says that because extinction is a natural process, we should not worry about the loss of biodiversity? 5- In what ways do humans occupy generalized niches and in what way do they occupy specialist niches?
Module 3	Sustaining Biodiversity
Key Concepts	Extinction of species, threats to ecosystems, sustaining sustaining biodiversity
Overview	This module focuses on the role of humans in the extinctions of species, and the impact of species extinction on humans and the environment. Emphasis will be placed on how we can protect wild species from extinction. In addition, sustaining forests and biodiversity are two topics that are discussed in details.
Aim	The aim of this module is to explore the problem of species extinction and the best practices to sustain biodiversity.
Learning Outcomes	At the end of this module students will be able to: • Know the role of humans in the extinction of species. • Evaluate the risks resulting from the rising rate of species extinction. • Recognize the best practices to protect wild species from extinction. • Know the major threats to forest ecosystems. • Understand the ecosystem approach to sustaining biodiversity.

Units	Unit 3.1: What role do humans play in the extinction of species? *Unit 3.2: Why should we care about the rising rate of species extinction?* Unit 3.3: How can we protect wild species from extinction? Unit 3.4: What are the major threats to forest ecosystems? Unit 3.5: Climate change can threaten forest ecosystem Unit 3.6: How should we manage and sustain biodiversity?
Readings	Levin, D. (2002) Hybridization and extinction: In protecting rare species, conservationists should consider the dangers of interbreeding, which compound the more well known threats to wildlife. American Scientist 90: 254. Matthews, M. (2002) When fire and forest health came to town: The forest service hopes its national fire plan can restore woodland while benefitting local economies. American Forests 107: 25. Helmuth L. (1999) Can this swamp be saved? Science News 155: 252.
Activity	
	Assignment 1- Identify examples of habitat destruction or degradation in your community that have had harmful effects on the populations of various wild plants and animal species. Develop a management plan for rehabilitating these habitats and species. 2- Choose a particular endangered animal or plant species and use the library or

	the internet to find out what is being done to protect it from extinction. Develop a protection plan for this species. 3- If ecosystems are undergoing constant change, why should we (a) establish and protect nature reserves and (b) carry out ecological restoration?S 4- Should there be a ban on the use of of-road vehicles and snowmobiles on all public land in Lebanon?
Module 4	Sustaining Natural Resources
Key Concepts	Soil and food, Pest management, water resources, mineral resources, renewable and nonrenewable energy.
Overview	The focus of this module is on natural resources that are necessary to sustain living organisms. We start with the discussion of soil as precious resources upon which agriculture is dependent, water resources, mineral resources in addition to renewable and non-renewable energy.
Aim	The aim of this module is to explore the natural resources necessary to sustain life.
Learning Outcomes	At the end of this module learners will be able to: • Discuss food security and why is it difficult to attain? • Evaluate environmental problems arising from industrialized food production. • Discuss sustainable agriculture. • Explore the importance of mineral resources. • Discuss the various forms of renewable and non-renewable energy resources.
Units	Unit 4.1: Food, soil and pest management Unit 4.2: Water resources

	Unit 4.3: Nonrenewable mineral resources energy resources. Unit 4.4: Nonrenewable energy Unit 4.5: Renewable energy and energy efficiency
Readings	Snell, M. B. (2001) Against the grain. Sierra 86:30 Finneran, K. (2001) What's food got to do with it? Issues in Science and Technology. Kerlin, K. (2001) Diamonds aren't forever E 12:54. Nanney, J. (2002) How motor efficiencies affect system desgns. Plant Engineering. Fairley, P. (2002) wind power for pennies: A light weight wind turbine is finally on the horizon and it just might be the breakthrough Technology Review 105:40.
Activity	**Overview**
	Assignment 1- What could happen to energy intensive agriculture in the industrialized countries if world oil prices rose sharply? 2- Why should it matter to people in developed countries that many people in developing countries are malnourished and hungry? What are the three most important actions in you believe should be taken to reduce hunger (a) in Lebanon (b) in the world?

	3- Develop a water conservation plan for your school and submit it to school officials. 4- How do human activities increase the harmful effects of prolonged drought? How can we reduce these effects? 5- Write a two-page scenario of what your life might be like without oil. Compare and discuss the scenarios developed by your class. 6- Make a study of energy use in your school and use the findings to develop an energy-efficiency improvement program. Present your plan to school officials.
Module 5	Sustaining Environmental Quality
Key Concepts	Air pollution, water pollution, Solid and hazardous waste, Climate change, and ozone depletion.
Overview	This module deals with aspects related to the quality of our environment. Humans are utilizing matter and energy at an exceedingly fast rate. This is creating problems of depletion of natural resources and environmental pollution. In this module we are going to discuss aspects related to water and air pollution and solid and hazardous waste management. We will emphasize global problems of climate change and ozone in our discussion.
Aim	The overriding aim of this module is to discuss several aspects related to the degradation of the environmental quality resulting from overuse of natural resources and energy.
Learning	At the end of this module learners will be able to:

Outcomes	• Know outdoor and indoor air pollution • Discuss acid deposition. • Recognize health effect of air pollution. • Discuss how the earth's temperature and climate change in the future. • Discuss the possible effects of a warmer atmosphere. • Discuss what can be done to slow projected climate change. • Recognize the problem and solutions to ozone depletion. • Discuss causes and effects of water pollution. • Discuss the problem and solutions to solid and hazardous waste
Units	Unit 5.1: Air pollution Unit 5.2: Climate change and ozone depletion Unit 5.3: Water pollution Unit 5.4: Solid and hazardous waste
Readings	Becker, R. and Henderson, V. (2000) Effects of air quality regulations on polluting industries. Journal of Political Economy 108:379. UNEP. (2013) *Climate Change* http://www.unep.org/pdf/UNEP_Profile/Climate_change.pdf Pacala, S., Socolow, R. (2004) Stabilization wedges: Solving the climate problem for the next 50 years with current technologies. Science 505:968-72. Rabalais, N, N., Turner, R. E., Scavia, D., (2002) Beyond science into policy: Gulf of Mexico hypoxia and the Mississippi River. BioScience 52:129.

	Evans, L. D. (2002) The dirt on phytoremediation. Journal of Soil and Water Conservation 57:13.
Activity	**Overview**
	Assignment 1- Congratulations! You are in charge of reducing air pollution in Lebanon. List the three most important features of your policy. 2- Suppose you become trapped in your car during a snowstorm and you have your engine and heater running to keep warm. Explain why you should roll down one of your windows just a little. 3- Do you agree or disagree with the argument by developing countries that developed countries should bear the brunt of reducing CO2 emissions because they produce much more of these emissions than developing countries? Explain. 4- Explain why developed nations are able to adapt to problems caused by increased global warming more easily than developing countries. Should developed countries provide significant aid to help developing countries adapt to the harmful effects of global warming? Explain. 5- Congratulations! You are in charge of the world. List your three most important actions for dealing with (a) global warming and climate change, (b) depletion of ozone in the stratosphere.

	6- How can a stream cleanse itself of oxygen-demanding wastes? Under what conditions will this natural cleansing system fail? 7- What hazardous wastes are produced (a) at your school and (b) in your community? What happens to these wastes?

Course Syllabus

ENS 205:

Environment, Society and Ethics

Notre Dame University-Louaize, Faculty of Natural and Applied Sciences, Department of Sciences

Spring Semester, 2013-2014

Instructor Information

Instructor: Dr. Tanos G. Hage

Office Location: S242, Main Campus

Telephone: Office – 09-208725

Office Hours:	MWF 1:00-2:00
E-mail:	thage@ndu.edu.lb
Website:	

Course Identification

Course Number:	ENS 205
Course Name:	Environment, Society and Ethics
Course Location:	Main Campus
Class Times:	MWF 3:00-4:00
Prerequisites:	None
Faculty Web Page:	http://www.ndu.edu.lb/academics/fnas/deanmess.htm

Course Description/Overview

Introduction to the environmental goods and services, impacts of population growth and economic development on the environment, the evolution of societies, community organizations and the quality of life are presented. Special focus is given to the value types and existing moral relationships between human beings and their environment, environmental ethics views, their evolution and effects on the environment and wildlife protection. Sustainability principles and the impacts of international policies, environmental management worldviews and legally binding agreements on natural resources, societies and the world's economic balance are emphasized.

Course Learning Objectives

The overarching goals of this course are: a) to provide a clear, systematic, and comprehensive introduction to the philosophical issues underlying environmental and ecological awareness. b) introduce the relevance of philosophy for environmental concerns and some traditional ethical theories and principles. c) examie attempts to extend moral standing to animals, future generations, tres, and other natural objects. d) explore comprehensive environmental and ecological philosophies such as biocentrism, ecocentrism, deep ecology and ecofeminism. e) discuss climate change ethics and sustainability.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

125. Explore the impacts of humans on the environment.
126. Understand the current concepts and controversies in relation to environmental ethics.
127. Examine the concept of human rights in the context of population pressures and the hunger of poor people around the world.
128. Distinguish between anthropocentric and non anthropocentric environmentalism.
129. Implement sustainability principles as a framework to improve the quality of life
130. Assess practical matters by addressing issues of personal character and lifestyle as well as public policy.
131. Address the issue of ethics of climate change and sustainability.

Course Resources

Required Text Book

Joseph R. DesJardins (2006) Environmental Ethics: An introduction to Environmental Philosophy. Fourth edition. Wadsworth, Cengage Learning. USA.

Additional References

Dale Jamieson (2008) Ethics *and the Environment*. Cambridge University Press, Cambridge, UK.

Peter S. Wenz (2001) *Environmental Ethics today*. Oxford University Press, Oxford, UK

Louis P. Pojman and Paul Pojman (2012) *Environmental Ethics: Readings in Theory and Applications*, Sixth edition. Wadsworth, Cengage Learning. USA.

Andrew Light and Holmes Rolston III (2003) *Environmental Ethics: An Anthology*. Blackwell Publishing, USA.

David R. Keller (2010) *Environmental Ethics: The Big Questions*. Wiley-Blackwell, U.K.

The ethics of sustainability: Charles J. Kibert Leslie Thiele Anna Peterson Martha Monroe
http://www.cce.ufl.edu/wp-content/uploads/2012/08/Ethics%20of%20Sustainability%20Textbook.pdf

Assignments and Grading Scheme

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Course Schedule

Week	Date	Topics
1-2		Science, ethic and the environment

3-4		Responsibilities to future generations: sustainable development
5-6		Responsibilities to the natural world: from anthropocentric nonanthropocentric ethics.
7-8		Biocentric ethics and the inherent value of life
9-10		The land ethics, deep ecology and ecofeminism
11-12		Environmental justice and social ecology
13-14		Climate Change and energy policy
15		Class presentations and discussions

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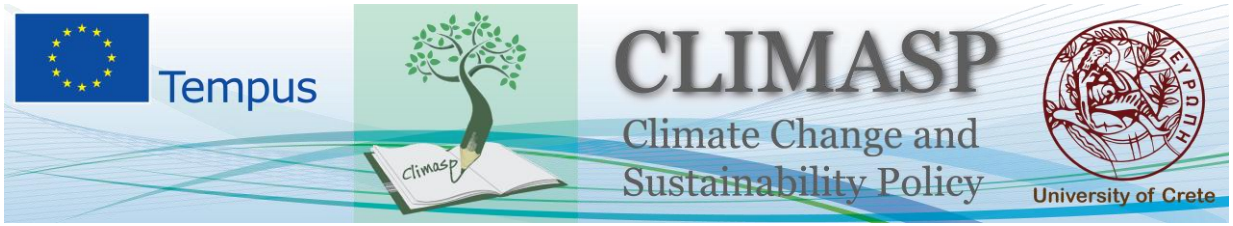
- Plagiarism; that is, the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Also, paraphrasing, summarizing, as well as well as direct quotations are considered as plagiarism, if the original source is not properly cited.
- Cheating.

- Assisting in cheating.
- Substituting a student in the taking of an examination.
- Substituting examination booklets.
- Submitting the same work for more than one course and the like. o Submitting papers written by others.
- Receiving or providing unauthorized help or assistance in any academic work or assignment. Intentional violation of program and degree requirements and regulation as established by the University.
- Dishonest reporting of computational, statistical, experimental, research, results, or the like.



Course	Environment, Society and Ethics
Module 1	Science, ethics and the environment
Key Concepts	Envionmental philosophy and ethics, Interplay between science and philosophy, decision making
Overview	Humans face unprecedented environmental challenges. Faced with such a catastrophic future we are challenged with critical decisions. Relying on science and technology without any consideration to ethical and philosophical issues may lead to more problems. Environmental policy needs to be decided upon in the political arena and not by scientists because the decisions that might be taken by experts in science and technology may not be objective.
Aim	The overriding aim of this module is to understand the critical role that environmental philosophy and ethics play in order to take the proper decisions related to environmental problems.
Learning Outcomes	At the end of this module learners will be able to: • Define environmental philosophy and environmental ethics. • Understand the role of environmental ethics in decisions related to environmental problems. • Discuss the interplay between scientists and environmental ethicists to reach the proper decisions related to environmental problems.
Units	Unit 1.1 Introduction: Why philosophy Unit 1.2: Science and ethics Unit 1.3: What is environmental ethics?

	Unit 1.4: Summary and conclusions
Readings	Louis P. Pojman and Paul Pojman (2012) *Environmental Ethics: Readings in Theory and Applications*, Sixth edition. Wadsworth, Cengage Learning. USA. The Master Bibliography in Environmental ethics has been composed by Holmes Rolston at Colorado State University and can beaccessed from the ISSE's website at http://www.cep.unt.edu/ISEE.html . This site has many links to other environmental resources.
Activity	**Overview** Assignment 1. When evaluating the safety of chemical pesticides, who should determine levels of acceptable risks? Is "risk" a matter of scientific fact, or is it a matter of value? What makes an issue a value issue? 2. Identify as many different uses of the words natural and nature as you can. Which, if any, have value connotations? Are all things that are "natural" also good? What about "human nature"? What is not natural about human beings? What would be the difference between "natural" fertilizers and "nonnatural" ones? Could there be such a thing as a "natural: pesticide? 3. Is there a difference between good science and bad science? We often hear that science should be value neutral. Is this true? Can you think of any values involved in the practice of good science? 4. How is reasoning about ethical matters different from reasoning about scientific matters? How do scientists evaluate controversial claims in science? How would we evaluate controversial ethical claims?

	5. What makes a belief or statement objective? Contrast this with subjective beliefs or statements. What statements about a tree, for example, are objective? What statements about a tree are subjective?
Module 2	Responsibilities to future generations: sustainable development
Key Concepts	Sustainable development, overpopulation, consumption, environmental ethics and sustainability.
Overview	This module looks at how overpopulations and overconsumption issues raise questions related to future generations. If these trends remained unchanged the earth may face environmental and economic collapse in the next century, thus threatening the existence of future generations. The increased production of greenhouse gases and the destruction of carbon-absorbing vegetation threaten the entire planet with shifting climates and global warming. Applying traditional, standard ethical theories are unsatisfactory to tackle the above issues. Philosophical ethics are extended to answer questions related to our responsibilities toward future generations.
Aim	The overriding aim of this module is to understand the debate related to our responsibilities for future generations based on newly developed theories of environmental philosophy.
Learning Outcomes	At the end of this module learners will be able to: • Understand the impact of our actions on the quality of the environment for future generations. • Demonstrate a clear understanding of the concept of sustainable development. • Evaluate the different ideas related to our responsibilities toward maintaining a healthy environment for future generations.
Units	Unit 2.1: Introduction

	Unit 2.2: Population, consumption, and environmental ethics Unit 2.3: Do we have responsibilities to future generations? Unit 2.4: Climate change and sustainability Unit 2.5: Consumptions and sustainable development Unit 2.6: Summary and conclusions
Readings	Anne and Paul Ehrlich (1987) *Earth*. Fraklin Watts, New York Paul Ehrlich and John Holdren (1988) *The Cassandra Conference: Resources for the Human Predicament*. Texas A&M University Press, Texas Station. Herman Daly (1987) *Sustainabe Growth: An Impossible Theorem.* Massachusetts Institute of Technology Press, Boston.
Activity	**Overview**
	Assignment 1- Controversies such as those surrounding global warming and climate change involve long term predictions and therefore cannot be resolved in the short term. In light of this uncertainty, is there one reasonable course of action? What does reason advise when we must make a decision with incomplete information? 2- Do you believe that overconsumption or overpopulation plays a greater role in environmental destruction? Which problem would you address first? 3- Does more material lead to greater happiness?

	4- Many indigenous cultures were destroyed when Europeans colonized the Americas and Africa. We can only guess at what we have lost as a result of these conquests. Have we been hurt by this loss? Can people be harmed by the loss of opportunities and the loss of knowledge of which they will never be aware? Will future generations be harmed if they never know about the blue whale or never know of a wilderness area? 5- Global warming and Climate Change results primarily from using fossil fuels for energy. Americans use much more fossil fuel energy per capita than most other people. In fact According to environmental journalist Bill McKibben, "an American uses seventy times as much energy as a Bangladeshi, fifty times as much as a Malagasi, twenty times as much as Costa Rican." One result is this: "During the next decade India and China will each add to the planet about ten times as many people as the United States will-but the stress on the natural world caused by new Americans may exceed that from new Indians and Chinese combined." In light of these facts, and the importance of mitigating global warming, maybe we should combat population growth in the United States. Currently, American can claim children as a tax deduction on income taxes. Perhaps this should apply only to the first two children . What do you think?
Module 3	Responsibilities to the natural world: from anthropocentric to nonanthropocentric ethics.
Key Concepts	Moral standing, anthropocentrism versus non anthropocentrism, Animal liberation and animal rights, moral standing to nature.
Overview	This module answers two fundamendal questions related to environmental ethics. First, what is the proper ethical relationship between humans and the natural environment? Second, what is the

	philosophical basis for this relationship.? Standard ethical theories are not enough to answer the above questions. According to the traditional theories we protect the environment for our interests (human centered views or anthropocentric views). In this module we examine the shift in the philosophical perspective. Philosophers started to argue that we have direct ethical responsibilities to nature, responsibilities that do not depend on the consequences to humans. This shift can be characterized as the shift between anthropocentric to nonanthropocentric theories of ethics.
Aim	This module aims at examining shift between anthropocentric to nonanthropocentric theories of environmental ethics.
Learning Outcomes	At the end of this module students will be able to: • Understand the concept of moral standing • Evaluate the shift between anthropocentric to nonanthropecentric views about nature and the environment. • Review the animal liberation movement as discussed by Peter Singer • Explain Tom Regan's argument concerning animal righlts • Discuss the systematic ethical considerations to nonhuman natural objects.
Units	Unit 3.1: Introduction Unit 3.2: Moral standing in the western tradition Unit 3.3: Early environmental ethics Unit 3.4: Moral standing Unit 3.5: Do trees have standing? Unit 3.6: Peter Singer and the animal liberation movement Unit 3.7: Tom Regan and animal rights Unit 3.8: Ethical implications of animal welfare Unit 3.9: Critical challenges:

Readings	Peter Singer (1990) *Animal Liberation*. Second edition. Review of Books Press, New York. Tom Regan (1985) *The Case for Animal Rights* in *In Defence of Animals*. Basil Blackwell, Oxford. Roderick Nash (1989) *The rights of Nature*. University of Wisconsin Press, Madison. Eugene Haegrove (1989) *Foundations of nvironmental Ethics*. Prentice-Hall, New York.
Activity	**Overview**
	Assignment 1- Throughout the world, many laws prohibit abuse of animals. List as many reasons for these prohibitions as you can. Do any of these reasons commit you to holding that animals have a moral standing in their right:? 2- Try the following mental experiment concerning what objects have moral standing. Assume that competent adult human beings are placed at one end of a continuum and a rock at the other. Where along that continuum would you place the following: a child, a brain-dead adult, a fetus, a dolphin, a dog, an insect, an alien, a bird, a species, and a tree? Have you used a single criterion either implicitly or explicitly? 3- Do you see any morally relevant differences between domesticated and wild animals? Would Singer? Would Regan? Do you see any morally relevant differences between animals that are threatened with extinction and those that are not?

	4- Does hunting or fishing raise any moral issues? If people eat the animals they kill, does that make a difference? In many areas, deer are overpopulating local habitats. Destruction of the habitat as well as mass starvation can occur in such circumstances. Would you favor selective hunting to thin overpopulated herds?
Module 4	Biocentric ethics and the inherent value of life
Key Concepts	Ethical extensionism, instrumental versus intrinsic value, Biocentrism,
Overview	The focus of this module is to consider systematic attempts in order to develop comprehensive environmental philosophies that are not in the realm of traditional standard Philosophy. Most of the recent philosophical work on the environment breaks with standard ethical theory and strive to rethink the relationships between humans and nature. Modern philosophers are are adopting the point of view of concerned citizens seeding to articulate, develop, and defend a coherent and comprehensive environmental philosophy.
Aim	The aim of this module is to explore the recent trends in environmental philosophy and ethics by emphasizing the concept of biocentrism or the reverence to life.
Learning Outcomes	At the end of this module learners will be able to: • Understand the concept of ethical extensionism • Define the terms instrumental and intrinsic vlaues • Evaluate the importance of biocentric ethics and its application in everyday life experiences.
Units	Unit 4.1: Introduction Unit 4.2: Instrumental value and intrinsic value Unit 4.3: Biocentric ethics and the reverence for life

	Unit 4.4: Ethics and character Unit 4.5: Taylor's biocentric ethics Unit 4.6: Practical implications Unit 4.7: Challenges and developments Unit 4.8: Summary and conclusions
Readings	James Brabazon (1975) *Albert Schweitzer: A Biography*. Putnam, New York. Holmes Rolston (1988) Environmental Ethics. Temple University Press, Philadelphia. R. Edward Grumbine (1994) Environmental *Policy and Biodiversity*. Island Press, Washington, D.C.
Activity	**Overview**
	Assignment 1- We use the word value both as a noun and as verb. Certain objects are said to possess value, and humans value numerous objects. If no humans were around to do the valuing, would anything of value remain? 2- Compose a list of things that you value. Distinguish those things that you value instrumentally from those things valued for their own sake. How many different types value can you think of? 3-Like Aristotle, Taylor suggests that each species has a distinctive nature that can best be identified in terms of a characteristic activity. How else might you distinguish between species? 4- In taylor's account, does it make sense to attribute interests or goods to

	a wilderness area, to a river, or to other ecosystems? Can such things be teleological centers of life?
Module 5	The land ethics, deep ecology and ecofeminism
Key Concepts	Ecocentric ethics, ecosystems, holistic ethics, land ethics, deep ecology, ecofeminism
Overview	Some philosophers think that we should go beyond focusing mostly on individual species. They believe that we have an ethical responsibility to take a wider view and work to prevent degradation of the earth's ecosystems, biodiversity and the biosphere. This ecocentric view is devoted to helping sustain earth's biodiversity and the functioning of its life-support systems for all forms of life, now and the future. Their view is that the natural systems that we are all part of is holistic, that is, interconnected and interdependent. Ecocentric world view hold that because humans and all forms of life are interconnected parts of the earth's life support system, it is in our own self-interest not to act in ways that impair the overall system. In this module we are going to explore three examples of ecocentric environmental philosophy: Land ethics, deep ecology and ecofeminism.
Aim	The overriding aim of this module is to discuss several examples of ecocentric environmental philosophies.
Learning Outcomes	At the end of this module learners will be able to: • Define holistic ethics and ecocentric ethics. • Disccus the influence of field of ecology in developing the ideas behind ecocentric ethics. • Describe the development of Leopold's land ethics principles. • Explore the criticisms associated with the Leopold's land ethics.

	• Explain the deep ecology platform as developed by Naess and Sessions. • Identify the two ultimate norms of deep ecology: self realization and biocentric equality. • Explore the criticisms associated with deep ecology • Elaborate on the variety of approaches that comprises ecofeminism
Units	Unit 5.1: The land ethics and Leopold's holism Unit 5.2: Criticism of the land ethics Unit 5.3: The ecology platform Unit 5.4: Self-realization and biocentric equality Unit 5.5: Criticisms of deep ecology Unit 5.6: Ecofeminism: making connections Unit 5.7: Ecofeminism: Recent developments
Readings	Aldo Leopold (1949) *A Sand County Almanac*. Ballantine, New York. J. Baird Callicott (1989) *In Defence of the Land Ethic*. State University of New York Press, Albany. John Davis (1991) *Earth first!.* Pergrine Smith Books, Salt lake City. Dave Foreman (1991) *Confessions of an Eco-Warrior*. Harmony, New York. George Sessions (1995) *Deep Ecology for the Twenty-First Century*. Shambala Publishing, Boston. Janet Biehl (1991) *Rethinking Ecofeminist Politics*. South End Press, Boston.

	Greta Gaard (1993) *Ecofeminism: Women, Animals, Nature*. Temple university Press, Philadelphia.
Activity	**Overview**
	Assignment 1- Should farmers and ranchers be allowed to kill wild predetors such as coyote and wolves in order to protect their herds? How should government balance these competing interests? 2- Do you support the view that humans are equal moral citizens of the biotic community? Is there a middle ground between humans as masters of nature and humans as equal biotic citizens? 3- Leopold suggests that the ”dead earth” is an organism that does possess a certain kind of life. What exactly is the difference between a living organism and a nonliving object? Is earth itself alive? 4- Can land or an ecosystem really be characterized as healthy or unhealthy in anything other than a metaphorical way? What exactly would a healthy ecosystem be? 5- Would civil disobedience in defence of the environment ever be justified? If so, when and why? Is tree spiking a defensible means for preventing logging of old-growth forests? 6- Is the statement “This is a tall tree” anymore objective that the statement “This is a majestic tree” ? Explain how both might be defended

	as true. 7- What "different questions" might someone taking a feminist approach to science and technology ask about such issues as nuclear energy, population policy, pesticides use, and animal agriculture?
Module 6	Environmental justice and social ecology
Key Concepts	Social justice theories, personal morality versus social justice, social ecology
Overview	Justice can be understood as the first principle of social and political philosophy: How should we live together? What is the proper structure of society. Living together in a community creates benefits and burdens that exist only within community, and we cannot account for community benefits and vurdens solely in erms of individual rifhts and responsibilities. Social justice must address these questions: How should the benefits and burdens of society be distributed? How should social institutions treat people? What do people deserve from society? What type of individual is created by various social structures and institutions? This module examines the question of environmental justice in general and, more specifically, as it is understood within the philosophical perspective that has come be called social ecology. Two basic questions guide the discussion of environmental justice: Who bears the burdens of environmental harms? And who, if anyone, benefits from environmental harms? Justice demands a fair distribution of benefits and burdens.
Aim	The major focus of this module is the discussion related to environmental

	justice and social ecology.
Learning Outcomes	At the end of this module learners will be able to: • Distinguish between personal morality and social justice. • Review the theories of social justice • Discuss the link between environmental racism and environmental justice. • Understand the concept of social ecology
Units	Unit 6.1: Introduction Unit 6.2: Theories of social justice Unit 6.3: Property rights and justice Unit 6.4: Environmental justice and environmental racism Unit 6.5: Murray Bookchin's social ecology Unit 6.6: Critical reflections Unit 6.7: Summary and conclusions
Readings	1- Murray Bookchin, Dave Foreman in Steve Chase, ed. (1991) *Defending the earth*. South End Press, Boston. 2- Robert Bullard, ed. (1994) *Unequal Protection*. Sierra Club Books, San Francisco.
Activity	**Overview**
	Assignment 1- Must a public policy intentionally discriminate before it can be described as racist or sexist? Is discrimination always a matter of intent? In your opinion, what is the intent behind decisions on where to locate waste dumps? 2- Bookchin claims that human beings cannot help but be, onr should they

	seek to being "purposive interveners" in nature. That would seem to conflict with the view of many preservationists and Deep Ecologists who believe taht humans should let nature take its course. Discuss how these different theorists might evaluate policy on population control. 3- If the price of land in a rural area is less than that of comparable land in an urban area, is this land less valuable? If not, how do you determine the value of land? 4- Nomadic countries on many continents travel great distances following migrating herds of animals. Such people never settle permanently on one section of land. How might their understanding of ownership and property differ from yours? Can a concept of "private property" even exist in such a culture?
Module 7	Climate Change ethics and energy policy
Key Concepts	
Overview	This module presents a selection of 8 essays selected from the literature that deals with climate change ethics and energy policy: 1- Understanding the causes of global climate change (Pew Center on Global Climate Change). 2- Livestock's role in climate change and air pollution (UN report: Climate change and livestock). 3- Ethics and global climate change (Stephen M. Gardiner). 4- The denial industry (George Monbiot).

	5- Hoodwinked in the Hothouse: False solutions to climate change. 6- Climate justice: The emerging movement against green capitalism (Ashley Dawson). 7- Sustainability and technology solutions in the climate policy debate: The case of geologic carbon sequestration (Evelyn Wright and Paul Pojman). 8- War and Climate Change (Barry Sanders). The first three essays offer an introduction to the science behind our understanding of climate change as well as the observed and predicted impacts. Together they make the argument that urgent action is needed. But although there is a consensus that action is needed, there is a vast difference of opinion as to what that action would be. The last four essays examine the growing resistance to proposed technological solutions, examining both the proposals and the global social concerns.
Aim	The overriding aim of this module is to critically evaluate eight essays that deals the science of climate change, proposed solutions and ethical concern.
Learning Outcomes	At the end of this module learners will be able to: • Understand the phenomenon of global warming and climate change. • Evaluate the proposed solutions to mitigate the effects of climate change. • Discuss the ethical concerns in relation to climate change
Units	Refer to the eight essays listed under the overview section.
Readings	The above eight essays are published in:

	Louis P. Pojman and Paul Pojman (2012) *Environmental Ethics: Readings in Theory and Applications,* Sixth edition. Wadsworth, Cengage Learning. USA.
Activity	**Overview**
	Read and evaluate the eight essays and provide a synthesis in a review article articulating the major ideas discussed. Review the status of climate change in Lebanon in regard to impacts, mitigation and adaptation practices. What is the ethical dimension of the climate change problem in Lebanon.

Course Syllabus

BIO 314:
Ecology
Notre Dame University-Louaize, Faculty of Natural and Applied Sciences, Department of Sciences

Spring Semester, 2013-2014

Instructor Information

Instructor:	Dr. Tanos G. Hage
Office Location:	S242, Main Campus
Telephone:	Office – 09-208725
Office Hours:	MWF 1:00-2:00
E-mail:	thage@ndu.edu.lb
Website:	

Course Identification

Course Number:	BIO 314
Course Name:	Ecology
Course Location:	Main Campus
Class Times:	MWF 1:00-2:00
Prerequisites:	None
Faculty Web Page:	http://www.ndu.edu.lb/academics/fnas/deanmess.htm

Course Description

Principles of ecosystems; the interaction of organisms and their environment. Food web, energy flow and nutrient cycling in ecosystems. Factors which affect the distribution and abundance of species, wildlife resources and extinction.

Course Overview

Ecology is the study of the relationships between organisms and their environment. It is a fascinating field that tries to understand nature as a whole, with all its interactions. The scope of ecologists range from an individual organism to the study of global scale processes, such as global warming and ozone depletion. The knowledge gained from ecology helps us understand and design solutions to environmental problems and offers humanity a chance to save our biosphere. In our discussion of ecology we will emphasize the science behind it as well as its societal applications. Since ecologists view biological systems in a hierarchy, we will take this approach in

arranging the topics of our discussions. We will start with the ecology of individuals, which is the domain of physiological ecology and behavioural ecology. Population ecology is studied next; this includes adaptation, extinction, distribution and abundance of species and population growth and regulation. This will bring us to the ecology of interactions such as competition, predation and parasitism. Community ecology on the other hand is concerned with factors controlling multispecies systems. Finally the highest level of organization is the ecosystem organization which include the physical and chemical factors influencing the community and focus on subjects such as energy flow and nutrient cycling in nature. Ecologists are concerned not only with communities, populations and organisms *in nature*, but also with manmade or human influenced environments, and with the consequences of human influence *on* nature (pollution, *global climate change*). In fact, our influence is so pervasive that we would be hard pressed to find an environment that was totally unaffected by human activity. Environmental problems are now high on the political agenda and ecologists clearly have a central role to play: a *sustainable future* depends fundamentally on ecological understanding and our ability to predict or produce outcomes under different scenarios.

Course Learning Objectives

The main objectives of this course are to a) learn about the basic mechanisms that are at work in the biosphere thorough understanding of the fundamental concepts that define the field of ecology. b) Use the knowledge gained from the field of ecology to understand the impact of human activities (pollution, global warming and climate change) on the natural systems. c) Emphasize the concept of sustainable development by highlighting the link between socio-economic needs and the environment.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

132. Learn and understand relationships among biotic and abiotic components of the environment.
133. Explore and analyze concepts related to population structure and dynamics, energy flow, nutrient cycling, interactions and succession in ecological communities and apply those concepts to real world problems.
134. Understand how scientists conduct experiments, analyze data and make conclusion about the natural world.

135. Convey scientific literature and express ecological knowledge about living things to others using oral and written communication.
136. Apply concepts learned in ecology to solve real world problems including global warming and climate change.

Course Resources

Required Course Text

M. C. Molles, Jr. (2013) *Ecology: concepts and applications*. Sixth edition, McGraw-Hill publishing company, Boston, MA
There is a website associated with this text. See: www.mmhe.com/molles6e
Hands-out prepared by the instructor, readings and assignments will be posted on blackboard.

Resources Available to Students
Library Resources: NDU Library is open to students to help you in all your research and class work. Qualified personnel are available to help you.
Writing Center: The Writing Center provides assistance to all students who wish to discuss their writing with a trained consultant. The Center is located in HA 114. An appointment is required.
Blackboard (bb) Software: Lecture material, handouts, readings and assignments will be posted on blackboard. If you are not familiar with the Blackboard system, it is recommended to attend a training session at the University Computer Services in order to know how to use the Blackboard system to enrich the academic communication with your instructor and your colleagues.

Field Observation:
Field trip(s) will be planned to visit a natural wild area in Lebanon. You should record all your observations, thoughts and questions in your field journal. Your field observations will be unique to you, reflecting your personal style. For each field trip a report is expected. Includes photos and sketches with your write up.

Grading and Evaluation

Exam I	20%
Exam II	20%
Final exam (comprehensive)	35%

Project and assignments	25%
Total	**100%**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

Classes are a mix of lectures (powerpoint presentations) and discussions. The lecture topic is announced ahead of time for you in order to read assigned material before coming to class. Each lecture begins with a clear and detailed set of learning objectives. After discussing a major concept, multiple choice, and short answer questions are administered in the class to test your understanding and to pinpoint deficient areas of comprehension. This interactive approach requires your active participation. Material and assignments will be posted on blackboard and Connect Ecology-interactive webpage associated with the textbook. Additional readings will be assigned from the literature on specific subjects.

Course Schedule

Week	**Topic** (additional readings are available in the course modules)	Reading
1	Introduction to Ecology: Historical Foundations and Developing Frontiers.	Ch 1
	Natural History and Evolution	
1&2	Life on Land	Ch 2
2	Life in Water	Ch 3

2&3	Population Genetics and Natural Selection	Ch 4
	Adaptation to the Environment	
3	Temperature Relations	Ch 5
4	Water Relations	Ch 6
5	Energy and Nutrient Relations	Ch 7
	Population Ecology	
6	Population Distribution and Abundance	Ch 9
7	Population Dynamics	Ch 10
8	Population Growth	Ch 11
9	Life Histories	Ch 12
	Interactions	
9&10	Competition	Ch 13
10	Exploitation: Predation, Herbivory, Parasitism and disease	Ch 14
11	Mutualism	Ch 15
	Communities and Ecosystems	
12	Species Abundance and Diversity	Ch 16
13	Species Interactions and Community Structure	Ch 17
14	Primary Production and Energy Flow	Ch 18
15	Nutrient Cycling and Retention	Ch 19
16	Succession and Stability	Ch 20

Course Policies
No make-up exam is allowed under normal circumstances. Consequently, a student missing an exam with no justifiable reason will lose the grade value of that exam.
Under abnormal circumstances a student is allowed a make-up exam under the following conditions:
1. The student shows that missing the exam was beyond his/her control.
2. The instructor and chairperson accept the case presented and approve of the make up.
3. The student may lose 10 points out of 100 of the grade value of the exam in question.
4. The make up exam shall be done within 10 days after the elapse of the exam date.

Assignments should be returned by the due date. Failure to do so will result in losing up to 20% of the grade.

Mobile phones should be turned off and out of sight (i.e. not face-up on the desk but preferably inside purses, backpacks, briefcases, etc. or face down on the desk). Phones may not be answered.

Students must attend class with the required material (i.e. original textbook, notebook, pens, etc.).

Once in class, students are expected to remain in class for the entire period.

English must be the only language spoken in class at all times.

Special needs: Any student who feels s/he may need an accommodation due to a disability should contact the instructor privately to discuss those specific needs.

Policies & Procedures

NDU's Attendance Policy
Student should attend all classes and laboratory sessions on time. A pattern of absences, whether authorized or not, and even below the maximum number (specified below), may alter one's grade substantially. The SAO alone authorizes absences. No absence absolves a student from the responsibility of acting upon the material presented during his/her absence. The maximum number absences for classes that meet on MWF is six; the maximum number for classes that meet on TTh and in the summer is four, (or two hours per credit course). Any student whose absences exceed the maximum limits shall automatically fail the course unless the student withdraws.

Office Hours: All instructors at NDU are available for office hours during the week. Please note the office hour that your instructor has dedicated to this course to make an appointment. Just dropping by may not ensure that the professor has set aside time to assist you. Office hours may be used ideally to ask for guidance on an assignment or to ask questions concerning a subject that you were not clear on during class time.

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- Cheating.
- Assisting in cheating.
- Substituting a student in the taking of an examination.
- Substituting examination booklets.
- Submitting the same work for more than one course and the like. o Submitting papers written by others.
- Receiving or providing unauthorized help or assistance in any academic work or assignment. Intentional violation of program and degree requirements and regulation as established by the University.
- Dishonest reporting of computational, statistical, experimental, research, results, or the like.

System of Grades

The University uses the following system of grades. This system consists of letter grades with their corresponding numerical ranges (*i.e.* percentage equivalent, and the 4.0 point maximum).

Grade	Description	Quality Point Value	Percentage Equivalent
A^{+}	Outstanding	4.0	97-100
A	Excellent	4.0	93 - 96
A^{-}	Very Good	3.7	89 - 92
B^{+}	Good	3.3	85 - 88
B	Good	3.0	80 - 84
B^{-}	Good	2.7	77 - 79

C+	Satisfactory	2.3	73 - 76
C	Satisfactory	2.0	70 - 72
C-	Passing	1.7	66 - 69
D+	Passing	1.3	63 - 65
D	Lowest Passing	1.0	60 - 62
F	Failure	0.0	0 - 59
UW	Unofficial Withdrawal	0.0	

The grade "*UW*" is assigned by the instructor when a registered student has never attended a class or has ceased attending and has not submitted an official course withdrawal request to the Office of the Registrar. This grade is computed as an *F* grade in the grade-point average.

Course	Ecology
Module 1	Introduction to Ecology/Natural History and Evolution
Key Concepts	Ecology, biosphere, ecosystem, evolution, soil horizons, biomes, climate diagram, natural history, aquatic environments, hydrologic cycle, adaptation, allele frequency, Hardy-Weinberg principle, natural and artificial selection, genetic drift, population genetics.
Overview	The first unit of this module introduces you to the discipline of ecology, it discusses the levels of ecological organizations and provides a sampling of ecological research performed in the field and/or laboratory. Units 2 and 3 provides an overview of natural history of terrestrial and aquatic environments. Natural history is the study of how organisms in a particular area are influenced by factors such as climate, soil, soils, predators, competitors and evolutionary history. In relation to biomes, large scale patterns of climatic variation is discussed, this includes the construction of climatic diagrams. For each of the different biomes and aquatic ecosystem, geography, climate, soils (for biomes only), biology and human influences are discussed. Evolution is a unifying principle of biology (including ecology) which provides a theoretical framework to study the diversity of life. In this unit, the theory of evolution by natural selection is discussed in detail. In addition topics related to population ecology are discussed, this includes Hardy-Weinberg equilibrium model.
Aim	The aim of this module is to introduce the field of ecology, be exposed to the natural history of the biosphere by discussing biomes and aquatic ecosystems and the impact of humans on them. Finally, an overview of population genetics is presented with emphasis on the theory of evolution by natural selection and the Hardy-Weinberg equilibrium model.
Learning Outcomes	At the end of this module learners will be able to: • Define the term ecology • Comprehend the reasons behind large-Scale patterns of climate variation.

	• Recognize the importance of soil as the foundation of terrestrial biomes. • Recognize the natural history and geography of biomes. • Assess the impact of humans on terrestrial biomes. • Discuss how technology can contribute to curriculum change. • Understand the hydrologic cycle • Recognize the natural history of aquatic environments • Assess the impact of humans on aquatic environments • Explain the theory of evolution by natural selection • Apply the Hardy-Weinberg model to iidentify evolutionary forces.
Units	Unit 1.1: Introduction to ecology: historical foundations and developing fron Unit 1.2: Life on land Unit 1.3: Life in water Unit 1.4: Populations genetics and natural selection
Readings	Norris R.D., P. P. Marra, T. K. Kyser, and L. M. Ratcliffe. 2005. Tracking habitat use of a long distance migratory bird, the American *redstart Setophaga rutcilla*, using stable-carbon isotopes in cellular blood. Journal of Avian Biology 36:164-70. Nadkarni, N. M. 1981. Canopy roots: convergent evolution in rainforest nutrient cycles. Science 214:1023-24. Janzen, D. H. 1981. Guanacaste tree seed-swallowing by Costa Rican range horses. Ecology 62:587-92. Clausen, J., D. D. Keck, and W. M. Hiesey. 1940. Experimental studies on the nature of species. I. The effect of varied environments on Western North American Plants. Washington, D.C.: Carnegie Institution of Washington, Publication no. 520.

	Vila-Aiub, M. M., M. C. Balbi, P. E. Gundel, C. M. Ghersa, and S. B. Powles. 2007. Evolution of glyphosate-resistent Johnsongrass (*Sorghum halepense*) in glyphosate-resistant soybean. Weed Science 55:566-71.
Activity	**Overview** Assignments: 1- Pick a research article related to ecology from a refereed scientific journal and outline the different steps of the scientific method used by the author(s). (Information, question, hypothesis, prediction, test of hypothesis) 2- Construct climate diagram for the different regions of Lebanon (Beirut, Tripoli, Bekaa, Besharee). How are they different? Can you predict the type of biome of each region? Data for each location is provided on Blackbaord. 3. Construct a table for the different terrestrial biomes on earth and indicate the main features related to geography, climate, soils, biology, and human influences, for each biome. 4-Construct a table for the different aquatic environments and indicate the main features related to geography, structure, physical conditions, chemical conditions, biology and human influences. 5- Construct a concept map for chapter 4, populations genetics and natural selection. 6- Solve the set of problems related to Hardy-Weinberg model. The problems

	are posted on blackboard. 7- Investigate the environmental threats to the Cedar forest of Bsherri in Lebanon. Deatail some of the conservation efforts undertaken to protect this forest.
Module 2	Adaptation to the Environment
Key Concepts	Acclimation, ectotherm, endotherm, homeotherm, Poikilotherm, macroclimate and microclimate, photosynthesis, thermal neutral zone, hyperosmotic, hypoosmotic, isoosmotic, osmoregulation, relatie humidity, water potential, autotroph, chemosynthetic autotroph, heterotroph, detritivore, Mullerian and batesian mimicry, fuctional response, optimal foraging theory.
Overview	In this unit we examine the relationships between organisms and temperature. This discussion has a practical application in view of the rapidly changing climate. Water is essential for all forms of life on earth. Most organisms must expand energy to maintain their internal water. Hence the study of water relations is fundamental to living organism especially for desert organisms. In order to survive organisms must obtain energy from their environment. Autotrophs use solar energy or inorganic chemicals. However, heterotrophs must obtain energy from the food they consume. The study of energy and nutrient relations addresses this subject.
Aim	The aim of this unit is to explore adaptations to environments in relation to temperature, water, nutrient and energy relations.
Learning Outcomes	At the end of this module learners will be able to: • Learn about microclimates and the factors that influence it.

	• Understand evolutionary trade-offs. • Characterize the performance of organisms in relation to temperature. • Explain how organisms regulate their body temperature. • Explain how organisms survive extreme temperatures. • Recognize water availability in different compartment.s • Discuss water regulation on land. • Understand water and salt balance in aquatic environments. • Learn about photosynthetic autotrophs, chemosynthetic autotrophs and heterotrophs. • Explain the optimal foraging theory. • Apply the concept of energy and nutrient relations: Bioremediation
Units	Unit 2.1: Temperature relations Unit 2.2: Water relation Unit 2.3: Nutrition and energy relations
Readings	Bennett, A. F. And R. E. Lenski. 2007. An experimental test of evolutionary trade-offs during temperature adaptation. Proceedings of the National Academy of Sciences of the United states. 104 supplement 1:8649-54. Baur, B. And A. Baur. 1993. Climatic warming due to thermal radiation from an urban area as possible cause for the local extinction of a landsnail. Journal of Applied Ecology 30:333-40. Toolson, E. C. And N. F. Hadley. 1987. Energy-dependent facilitation of transcuticular water flux contributes to evaporative cooling in the sonoran desert cicada, Diceroprocta apache (Homoptera, Cicadidae). Journal of Experimental Biology 131:439-44. Tracy, R. L. And G. E. Walsberg. 2002. Kangaroo rats revisited: re-evaluating a classic case of desert survival. Oecologia 133:449-57.

	Watwood, M. E. And C. N. Dahm. 1992. Effects of aquifer environmental factors on biodegradation of organic contaminants. In Proceedings of the International Tropical Meeting on Nuclear and Hazardous Waste Management Spectrum '92. La Grange Park, III.:American Nuclear Society. White, C. S. And J. T. Markwiese. 1994. Assessment of the potential for *in situ* bioremediation of cyanide and nitrate contamination at a leach mine in central New Mexico. Journal of Soil Contamination 3:271-83.
Activity	**Overview**
	Assignments: some assignments are taken or modified from the textbook. 1- Many species of plants and animals that are associated with boreal forests also occur on mountains far to the south of the boreal forests. Using what you have learned about microclimates predict how aspect and elevation would influence their distributions on these southern mountains. 2- J. L. Mosser and colleagues found that populations of the bacterium *Sulfolobus* living at different temperatures has different optimal temperatures for sulfur oxidation. Use natural selection to explain these patterns. Design an experiment to test your explanation. Assume you can create artificial springs and regulate their temperature as you like. 3- Distinguish among vapor pressure deficit, osmotic pressure, and water potential. How can all three phenomena be expressed in the same units of measure: pascals. 4- Why are plants such as mosses living in the understory of a dense forest, which show higher rates of photosynthesis at low irradiance, unable to live in

	environments where they are exposed to full sun for long periods of time? 5- In type 3 functional response, what mechanisms may be responsible for low rates of food intake – compared to type 1 and type 2 functional response- at low food densities? 6- The data of Iriarte and colleagues suggest that prey size may favor a particular body size among pumas. However, this variation in body size also correlates well with latitude; the larger pumas live at high latitudes. Consequently, this variation in body size has been interpreted as the result of selection for efficient temperature regulation. Homeothermic animals are often larger at high latitudes, a pattern called Bergmann's rule. Larger animals, with slower surface area relative to their mass, would be theoretically better at conserving heat. Smaller animals, with higher surface area relative to their masss, would be theoretically better at keeping cool. So what determines predator size? Is predator size determined by climate, predator-prey interactions, or both? Design a study of the influence of the environment on the size of homeothermic predators.
Module 3	Populations Ecology
Key Concepts	Regular, random and clumped distributions, niche, age distribution, birth and death rate, cohort life table, geometric rate of increase, life table, numerical response, survivorship curve, carrying capacity, geometric and exponential population growth, reproductive effort, ruderal, semelparity, phenology, k selection.
Overview	In this section we are going to study aspects related to populations: a) population distribution and abundance. b) population dynamics which is

	concerned with factors influencing the expansion, decline, or maintenance of population. d) population growth. e) life histories which consists of the adaptations of an organism regarding the offsprings it produces, its survival, its age and size at reproductive maturity. Population studies is a key to manage wildlife, control pest populations and save endangered species.
Aim	The aim of this module is to understand the principles of population ecology and be able to apply these principles to real life applications. Population ecology holds the key to saving endangered species, manage wildlife and forests, understand and control disease epidemics.
Learning Outcomes	At the end of this module learners will be able to: • Learn about the effect of the environment on the distribution of species. • Recognize the factors that affect the distribution patterns of individuals within populations on small and large scales. • Apply the concepts learned to assess the level of rarity and vulnerability to extinction of populations. • Comprehend the influence of population dispersal on distribution and abundance. • Understand the temporal dynamics of populations by focusing on patterns of survival and reproduction in populations. • Apply the concepts learned in population dynamics to assess the impact of human generated pollutants on ecosystems. • Examine exponential and geometric growth • Study the effect of the environment on population growth. • Study the history, current state and projected growth of human population. • Recognize life histories: the adaptations of organisms that influence the number of offspring it produces, its survival, its size and age at reproductive maturity. • Apply the concepts learned in life histories to restore riparian forests.

Units	Unit 3.1: Population distribution and abundance Unit 3.2: Population dynamics Unit 3.3: Population growth Unit 3.4: Life histories
Readings	Huchinson, G. E. 1959. Homage to Santa Rosalia or Why are there so many kinds of animals? Amrican Naturalist 93:145-159. Caughley, G., J. Short, G. C. Grigg, and H. Nix. 1987. Kangaroos and climate: an analysis of distribution. Journal of Animal Ecology 56:751-761. Winston, M. L. 1992. Biology an management of Africanized bes. Annual Review of Entomology 37: 173-93. Hengeveld, R. 1988. Mechanisms of biological invasions. Journal of Biogeography 15:819-828. U.S. Bureau of the Census, International Database. http://www.cencus.gov/pub/ipc/www/idbnew.html Turner, T. F. and J. C. Trexler, 1998. Ecological and historical associations of gene flow in darters (Teleostei:Percidae). Evolution 52:1781-1801. Braatne, J. H., S. B. Rood, and P. E. Heilman. 1996. Life history, ecology and conservation of riparian cotton woods in North America. In R. F. Stettler, J. H. D. Bradshaw, P. F. Heilman, P. E. and T. M. Hinckley, eds. Biology of Populus and Its Implications for conservation and management. Ottawa:

	NRC Research Press.
Activity	**Overview**
	Assignments: some assignments are taken or modified from the textbook. 1- Cedars of Lebanon (*Cedrus libani*) occurs throughout the western chains of mountains in Lebanon. a) Check the literature and draw a map of their distribution. How do altitude and aspect affect their distribution? Are any populations of cedars of Lebanon found above an altitude of 2000 m. If not justify your answer. In the mountains of Turkey cedars of Lebanon can grow at much higher altitudes. Speculate the reason behind this difference. 2- Suppose one plant reproduces almost entirely from seeds, and that its seeds are dispersed by wind, and a second plant reproduces asexually, mainly by budding from runners. How should these two different reproductive modes affect local patterns of distribution seen in populations of the two species? 3- How might energy and nutrient relations explain the lower population densities of birds compared to comparable-sized mammals. 4- The world population is increasing at an alarming rate. Explain the impact of this rapid growth on the environment and on sustainable development. On what basis the carrying capacity of the earth is calculated? 5- Why do many populations of exotic species, such as zebra mussels, Eurasian collared doves and tree of heaven, often grow at an exponential rate for some time following their introductions into a new environment? 6- The discussion of seed size and number of focused on the advantages associated with large seeds. However, researchers revealed that the plants from

	widely separated geographic regions produce a wide variety of seed sizes. If this variation is to be maintained, what are some of the advantages associated with producing small seeds?
Module 4	Interactions
Key Concepts	Interspecific and intraspecific competition, competitive exclusion principle, exploitation, predation and herbivory, parasites and pathogens, facultative and obligate mutualism.
Overview	This module introduces the ecology of interactions by bringing biological components together. Evolutionary effects of interactions on the species will be addressed. This unit also explores the effect of interactions on the structure of the population and on properties of the ecological communities. Practical applications learned from the ecology of interactions include the study of human disturbance on ecosystems, biological pest control and the modification of food webs by humans.
Aim	The aim of this module is to introduce the major concepts related to the biology of interactions and their applications in everyday life such as biological pest control and control of invasive species.
Learning Outcomes	At the end of this module learners will be able to: • Compare and contrast intraspecific and interspecific competition. • Discuss the competitive exclusion principle. • Explain the effect of competition on the ecological and evolutionary influences on the niches of a species. • Understand the mechanisms allowing invasive species to invade communities of native species. • Recognize the extent of exploitative interactions in an ecosystem. • Appreciate the value of pest control by predators. • Explore mutualisms in nature.

	• Evaluate the benefit of mutualisms in agriculture.
Units	Unit 3.1: Competition Unit 3.2: Exploitative interactions Unit 3.3: Mutualism
Readings	1- Byers, J. E. 2000.Competition between two estuarine snails: implications for invasions of exotic species. Ecology 81:1225-12239. 2- Bryers, J. E. and L. Goldwasser. 2001. Exposing the mechanism and timing of impact of nonindigenous species on native species. Ecology 82:1330-1343. 3- Lindstrom, E. R., H. Andren, P. Angelstam, G. Cederlund, B. Hornfeldt, L. Jaderberg, P. A. Lemnell, B. Martinsson, K. Skold, and J. E. Swenson. 1994. Disease reveals the predator: sarcoptic mange, red fox predation, and prey populations. Ecology 75:1042-1049. 4- Krebs, C. J., R. Boonstra, S. Boutin, and A. R. Sinclair. 2001. What drives the 10-year cycle of snowshoe hares? BioScience 51:25-36. 5- Kalka, M. B., A. R. Smith, and E. k. V. Kalko. 2008. Bats limit arthropods and herbivory in a tropical forest. Science 320:71. 6- Isack, H. A. and H. U. Reyer. 1989. Honeyguides and honey gatherers: interspecific communication in a symbiotic relationship. Science 243:1343-1346.
Activity	**Overview**
	Assignments: (some assignments taken or modified from the textbook) 1- The competitive exclusion theory states that two species cannot occupy

	the same nice indefinitely. What is the a fundamental assumption of this principle. 2- Do resources have to be present in limited supplies for competition to shape niches? 3- Can we conclude that interspecific competition commonly restricts species to realized niches in nature, based on the results of mathematical models and laboratory experiments? 4- One of the conclusions that seems justified in light of several decades of studies of interspecific competition is that competition is a common and a strong force operating in nature, but not always and not everywhere. List the environmental circumstances in which you think intraspecifc and interspecific competition would be most likely to occur in nature. In what circumstances do you think competition is least likely to occur? How would you go about testing your ideas? 5- How could you test experimentally for the combined influence of bats and birds on numbers of arthropods on foliage, as well as their individual contributions? (Check the paper of bats in the list of references for this unit). 6- Both mathematical and laboratory models offer valuable insights into the dynamics of predator-prey systems. What are some advantages and limitations of each approach? 7- predation is one of the processes by which one organism exploits another. Others are herbivory, parasitism, and disease. What distinguishes

	each of these processes, including perdation, from the others? We can justify discussing these varied processes under the heading of exploitative interactions because each involves one organism making its living at the expense of another. By what "currency" would you measure that expense (e. g., energy, fitness)?
Module 5	**Communities and Ecosystems**
Key Concepts	Species diversity and evenness, community structure, commensalism, dominant or foundation species, food web, keystone species, ecological efficiency, net primary and secondary production, trophic level, decomposition, mineralization, eutrophication, nutrient cycling, climax community, pioneer community, primary and secondary succession.
Overview	In this unit we are going to discuss communities and ecosystems. Communities are composed of interacting species and their study is concentrated on the organisms inhabiting an area. However, the study of ecosystems includes the physical and chemical factors influencing the community as well, such as nutrient cycling and energy flow. Practical applications to community ecosystem ecology include: disturbance by humans to ecosystems, human modifications of foodwebs, altering aquatic ecosystems (eutrophication).
Aim	The aim of this unit is introduce the major principles and concepts related to community and ecosystem ecology.
Learning Outcomes	At the end of this module learners will be able to: • Recognize the factors affecting species abundance and diversity. • Study the effect of disturbance on promoting higher diversity. • Understand the effect of human activities on species diversity and abundance in urban areas.

	• Discuss the importance of food webs. • Evaluate the importance of keystone species. • Comprehend the factors limiting terrestrial primary productivity. • Define the trophic levels and energy flow in an ecosystem. • Discuss nutrient cycling and retention in an ecosystem. • Examine ecosystem changes during succession. • Evaluate the impact of invasive species on plant succession.
Units	Unit 5.1: Species abundance and diversity Unit 5.2: Species interactions and community structure Unit 5.3: Primary production and energy flow Unit 5.4: Nutrient cycling and retention Unit 5.5: Succession and stability
Readings	1- Lebo, M. E., J. E. Reuter, C. R. Goldman, N, C. L. Rhodes, N. vucinich, and D. Mosely. 1993. Spatial variations in nutrient aand particulate matter concentrations in Pyramid lake, Nevada, USA, during a dry period. Canadian Journal of Fisheries and aquatic Science 50:1045-1054. 2- Lilleskov, E. A., T. J. Fahey, T. R. Horton, and G.M. Lovett. 2002. Belowground ectomycorrhizal fungal community changes over a nitrogen deposition gradient in Alaska. Ecology 83:104-115. 3- Blair, R. 2004. The effects of urban sprawl on bids at multiple levels of biological organization. Ecology and Society 9:2 [online]. 4- Tscharntke, T. 1992. Cascade effects among four trophic levels: bird predation on galls affects density-dependent parasitism. Ecology 73:1689-1698.

5- Orrock, J. L., M. S. Witter, and O. J. Reichman. 2008. Apparent competition with an exotic plant reduces native plant establishment. Ecology 89-1168-1174.

6- Kaspari, M., S. O'Donnell, and J. R. Kercher. 2000. Energy, density, and constraints to species richness: ant assemblages along a productivity gradient. American Naturalist 155:280-293.

7- Sala, O. E., W. J. Parton, L. A. Joyce, and W. K. Laurenroth. 1988. Primary production of the central grassland regions of the United States. Ecology 69:40-45.

8- Gallardo, A. and J. Merino. 1993. Leaf decomposition in two Mediterranean ecosystems of southwest Spain: influence of substrate quality. Ecology 74:152-161.

9- Takyu, M., S. I. Aiba, and K. Kitayama. 2003. Changes in biomass, productivity and decomposition along topographical gradients under different geological conditions in tropical lower montane forests on Mount Kinabalu, Borneo. Oecologia 134:397-404.

10- Pickett, S. T. A., M. L. Cadenasso, J. M. Grove, P. M. Groffman, L. E. Band, C. G. Boone, W. R. Burch Jr., C. S. B. Grimmond, J. Hom, J. C. Jenkins, N. L. Law, C. H. Nilon, R. V. Pouyat, K. Szlavecz, P. S. Warren, and M. A. Wilson. 2008. Beyond urban legends: nan emerging framework of urban ecology, as illustrated by the Baltimore Ecosystem Study. BioScience 58:139-150.

11- Chapin, F. S., III, L. R. Walker, C. L. Fastie, and L. C. Sharman. 1994.

	Mechanisms of primary succession following deglaciation at Glacier Bay, Alaska. Ecological Monographs 64:149-75.
Activity	**Overview**
	Assignments: some assignments are taken or modified from the textbook. 1- Suppose you discover that the fish species inhabiting small, isolated patches of coral reef use different vertical zones on the reef face- some species live down near the sand, some live a bit higher on the reef, and some higher still. Based on this pattern of zonation, can you predict how reef structure should affect the diversity of fish living on such reefs? 2- If disturbance can foster higher species diversity, why is human disturbance often (though not always) associated with reduced species diversity? 3- According to the intermediate disturbance hypothesis, could human disturbance sustain higher levels of species diversity than in the absence of human disturbance? 4- Humans have been living in the tropical rain forests of the New World for at least 11,000 years. During this period, disturbance by humans has been a part of these tropical rain forests. Use the intermediate disturbance hypothesis to explain how recent disturbances threaten the biological diversity of these forests, while earlier disturbances apparently did not. 5- Some paleontologists have proposed that overhunting caused the extinction of many large North American mammals at the end of the Pleistocene about 11,000 and 10,000 years ago. The hunters implicated by paleontologists were a

	newly arrived predatory species, *Homo sapiens*. Offer arguments for and against this hypothesis. 6-The studies of nutrient limitations of aquatic primary production that we reviewed in class focused almost entirely on lakes within the temperate zone. Suppose you are an ecologist interested in determining whether primary production in tropical lakes is subject to similar control by nutrient availability. Design a study to find out what controls rates of primary production in tropical lakes. Use all the sources of information at your disposal, including published research, surveys of natural variation, and large- and small-scale experiments. 7- The concentration of atmospheric CO_2, which continues to rise, has been associated with an increased lignin content of the leaves of some plant species. Why is this potential change in leaf chemistry, in response to increased atmospheric CO2, an active area of research by ecosystem ecologists? 8- Many rivers around the world have been straightened and deepened to improve conditions for navigation. Side effects of these changes include increased average water velocity and decreased movement of water into shallow riverside environments such as marginal wetlands. What are the probable influences of these changes on the nutrient spiraling length? Use the model discussed by Newbold in the textbook. 9- Succession seems to lead to predictable changes in community and ecosystem structure. Predict the characteristics of a frequently disturbed community/ecosystem. What do your predictions suggest about a future biosphere increasingly disturbed by a growing human population? How does

	the intermediate disturbance hypothesis figure into your answer?
Module 6	**Global warming and Climate change**
Key Concepts	Applied ecology, global distribution of climate change, Impact of climate change on biodiversity and ecosystems.
Overview	One of the biggest future challenges to organisms, ecologists and resource managers is global climate change. Attempts to mitigate predicted changes to climate have an ecological dimension (e.g. plant more trees to soak up some of the extra carbon dioxide produced by the burning of fossil fuels), although mitigation must also focus on the economic and sociopolitical dimensions of the problem. This is discussed because the relevant issues relate to ecosystem functioning. In this module we deal with the way we can use knowledge about the ecology of individual organisms to predict and manage the consequences of global climate change such as the spread of disease and weeds and the positioning of conservation reserves. Given the pressing environmental problems we face, it is not surprising that a large number of ecologists now perform research that is applied (i.e. aimed directly at such problems) and then publish it in specialist scientific journals.
Aim	The aim of this unit is to use knowledge gained in the feild of ecology to help solve problems associated with climate change.
Learning Outcomes	At the end of this module learners will be able to: • Understand how to use the knowledge gained in ecological research to predict and manage the consequences of global climate change. • Study the impact of climate change on biodiversity • Examine the impact of climate change on the spread of disease

	• Study the impact of climate change on the spread of invasive species. • Explore how predicted global climate change is expected to affect species' distribution patterns.
Units	Unit 5.1: The global distribution of climate change Unit 5.2: Can the biota keep up with climate change? Unit 5.3: the challenge of global climate change Unit 5.4: The impact of climate change on biodiversity and ecosystems Unit 5.5: the impact of climate change on health Unit 5.6: Adaption of living organisms to climate change.
Readings	1- Beaumont, L.J. & Hughes, L. (2002) Potential changes in the distributions of latitudinally restricted Australian butterfly species in response to climate change. *Global Change Biology*, 8, 954–971. 2- Corn, P.S. (2003) Amphibian breeding and climate change: importance of snow in the mountains. *Conservation Biology*, 17, 622–625. 3- Ehleringer, J.R., Sage, R.F., Flanagan, L.B. & Pearcy, R.W. (1991) Climate change and the evolution of C4 photosynthesis. *Trends in Ecology and Evolution*, 6, 95–99. 4- Kriticos, D.J., Sutherst, R.W., Brown, J.R., Adkins, S.W. & Maywald, G.F. (2003) Climate change and the potential distribution of an invasive alien plant: *Acacia nilotica* spp. *indica* in Australia. *Journal of Applied Ecology*, 40, 111–124. 5- Law, B.E., Thornton, P.E., Irvine, J., Anthoni, P.M. & van Tuyl, S.

	(2001) Carbon storage and fluxes in ponderosa pine forests at different developmental stages. *Global Climate Change*, 7, 755–777.
Activity	**Overview**
	Assignments: some assignments are taken or modified from the textbook. 1- would you favor buildingmore nuclear power plants to reduce CO2 emissions? Why or why not? 2- Many people don't believe climate change is going on even though climate scientists have amassed a great deal of data to demonstrate it. What factors do you think influence the degree to which a person believes or doesn't climatologists' reports? 3- What is the impact of climate change on biodiversity, forestry and agriculture in Lebanon? 4- What is the difference between climate change and climate variability?4-

Student Practicum Placement

In this course you will be assigned a practicum to integrate the knowledge acquired in class to real life applications. The practicum is a short term supervised work with the assigned facility/institution. This will give you an opportunity to use your skills, knowledge and experiences in the real world and open your eyes to face new challenges that may arise in the future.

Practicum 1:

A ROCHA Lebanon, NGO.

A ROCHA Lebanon, is an NGO that was established in 1996 with the main objective of saving Ammiq wetlands in the Beqaa valley in Lebanon from destruction. The work of A ROCHA Lebanon currently focuses on three main areas: scientific studies, practical conservation, and environmental education.
After finishing your practicum with A ROCHA Lebanon, the following are expected of you:

1- You should be familiar with the overall activities related to environmental conservation.
2- More specifically, you should participate in the work done to protect migratory birds. You should be able to integrate knowledge gained in class to propose solutions to problems facing migratory birds.
3- At the end of the practicum you will write a report and give a presentation, emphasizing what you have learned from the practicum.

Practicum 2:

Organic farms in the area of Zouk Mikayel

In this practicum you will spend time with the managers of the organic vegetable farms in the area of Zouk Mikayel. You will have to familiarize yourself, and report all the cultural practices utilized in the above operations. Most importantly, you have to emphasize and document sustainable practices, like biological control of pests and maintaining the health and fertility of the soil. In your report and presentation you have to compare and contrast organic vs conventional farms and highlight the importance of sustainable practices to improve the quality of life of the society and individuals.

Practicum 3:

Ministry of Agriculture-Forestry section

The forestry sector in Lebanon is under major environmental threat that are caused by human activities, such as forest cutting and fires. After finishing your practicum at the ministry you should be able to draw a clear picture of the current status of forests in Lebanon and future plans to conserve these forests. Most importantly, you should apply the principles and concepts learned in class to conserve and use this precious natural resource sustainably. A report and a presentation are required to showcase what you have learned from this practicum.

Practicum 4:

Shouf Cedar Reserve

The Shouf Cedar Reserve is the largest nature reserve in Lebanon that covers approximately 5% of the area of Lebanon. This reserve is a haven for biodiversity. The following are the main objectives of the reserve which focuses on sustainable development of the local community:

- Natural and cultural heritage conservation of the region
- Research and monitoring
- Eco-tourism
- Environmental awareness
- Capacity building

After finishing your practicum you should write a report and give a presentation emphasizing the sustainable practices done to protect and develop the area of the resrve. Also you should integrate what you have learned in class to conserve the area using the principles of sustainability.

Practicum 5:

Ministry of the Environment

The world is facing a real threat due to climate change and global warming. The Lebanese Ministry of the Environment is conducting studies, in collaboration with UN agencies, related to emissions of greenhouse gases in Lebanon and exploring new adaptation strategies to reduce the impact of climate change and global warming on society.
After finishing this practicum you should be familiar with the work done related to the above issue. You are also required to write a report and give a presentation emphasizing the concepts learned in class and how it can be applied to reduce the impact of climate change and global warming.

Course Syllabus

BIO 324
Plant Physiology
Notre Dame University-Louaize, Faculty of Natural and Applied Sciences, Department of Sciences
Spring Semester, 2014-2015

Instructor Information

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Course Identification

Course Number:	BIO 324
Course Name:	Plant Physiology
Course Location:	FA 1032
Class Times:	MWF 9:00 – 10:00/F 13:00 – 15:00
Prerequisites:	BIO 212 and BIO 227
Faculty Web Page:	http://www.ndu.edu.lb

Course Description

This course covers the basic principles of plant physiology, the physiological processes of green plants and the effect of the environment on these processes. Prerequisite: BIO 212, BIO 227.

Course Overview

This is an introductory, undergraduate course in Plant Physiology. Plants are unique organisms that can manufacture their own food (biomass) from carbon dioxide, water and sunlight. In turn other organisms are dependent on this food for survival, including humans. Plants play a crucial role in our life by providing animals and humans with food, feed, paper, medicine, chemicals, energy, and beautiful landscapes. In addition plants provide ecological services such as regulation of the water cycle and climate, soil formation, nutrient recycling and air purification. Plant physiology is the study of the organization and operations of the processes in the plant that order its development and behavior. Simply put it is the study of plant functions. In this course we will concentrate on transport and translocation of water and solutes, Biochemistry and metabolism, and brief account on growth and development. Throughout the course, and in particular towards the end, concepts related to climate change and sustainability will be emphasized.

Course Learning Objectives

The main objectives of this course are to a) Gain a thorough understanding of the functioning of the plants in their environment b) Develop critical thinking skills to ask pertinent questions related to plant physiology and to go about seeking answers to those questions. c) Use the knowledge gained from Plant Physiology to understand the role of plants in ecosystems. c) Emphasize the concept of sustainable development and climate change by highlighting the link between plants, socio-economic needs and the environment.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

137. Appreciate the important role of plants in the ecosystem and the services rendered to other organisms, including humans.
138. Understand the unique physical properties of water, the concept of water potential and its application to cell-water relations.
139. Demonstrate in-depth an understanding of the physiological processes involved in water balance in plants.
140. Describe how plants obtain and use mineral nutrients.
141. Understand the physical and chemical principles that govern the movements of molecules in solutions and how these principles apply to membranes and to biological systems.
142. Explain the role of light in photosynthesis and the processes that are involved in the synthesis of ATP and NADPH.
143. Describe the cyclic reactions that accomplish the fixation and reduction of CO2 to produce organic molecules.
144. Understand the process of translocation of photosynthates in the phloem.
145. Understand the role of plant secondary metabolites in plant defense mechanisms.
146. Cultivate basic understanding of plant growth and development.
147. Infuse the concept of sustainable development and climate change in the course.

Course Resources

Required Course Text

Taiz,L, Zeiger, E. Molles, (2006) *Plant Physiology*. Fourth edition, Sinauer Associates, Inc., Publishers, Sunderland, MA
There is a website associated with this text. See: www.plantphys.net
Hands-out prepared by the instructor, readings and assignments will be posted on blackboard.

References

Hopkins, G. and Huner, N. 2004. Introduction to Plant Physiology. 3rd ed. John Wiley & Sons.
Buchanan, B; Gruissem, W. and Jones, R. 2000. Biochemistry and Molecular Biology of Plants. American Society of Plant Physiologists.
Walter, L. 2003. Physiological Plant Ecology: Ecophysiology and Stress Physiology of functional groups. 4th ed. Springer.

Resources Available to Students

Library Resources: NDU Library is open to students to help you in all your research and class work. Qualified personnel are available to help you.

Writing Center: The Writing Center provides assistance to all students who wish to discuss their writing with a trained consultant. The Center is located in HA 114. An appointment is required.

Blackboard (bb) Software: Lecture material, handouts, readings and assignments will be posted on blackboard. If you are not familiar with the Blackboard system, it is recommended to attend a training session at the University Computer Services in order to know how to use the Blackboard system to enrich the academic communication with your instructor and your colleagues.

Grading and Evaluation

Exam I	20%
Exam II	20%
Final exam (comprehensive)	35%
Lab work and assignments	25%
Total	**100%**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

Classes are a mix of lectures (powerpoint presentations) and discussions. The lecture topic is announced ahead of time for you in order to read assigned material before coming to class. Each lecture begins with a clear and detailed set of learning objectives. After discussing a major concept, multiple choice, and short answer questions are administered in the class to test your understanding and to pinpoint deficient areas of

comprehension. This interactive approach requires your active participation. Laboratory experiments are designed to parallel, augment and clarify lecture material. Assigned reading from current literature will keep you abreast with recent developments in the field. I will use blackboard to post announcements and lecture material.

Course Schedule

# Weeks	**Topic** (additional readings are available in the course modules)	Reading
1	Discussion of the syllabus.	
	Transport and Translocation of Water	
1-2	Water and plant cells.	Ch 3
3	Water balance of plants.	Ch 4
	Transport and Translocation of Solutes	
4	Mineral nutrition.	Ch 5
5	Solute transport.	Ch 6
	Biochemistry and Metabolism	

6-7	Photosynthesis: the light reactions.	Ch 7
8-9	Photosynthesis: carbon reactions.	Ch 8
10	Translocation in the phloem.	Ch 10
11	Secondary metabolites and plant defence.	Ch 13
	Growth and Development	
12	Growth and Development (Several sources)	
	Growth and Development	
13-14	Focous on climate change and sustainable development	

Course	Plant Physiology
Module 1	Transport and Translocation of Water
Key Concepts	Polarity of water molecule, Hydrogen bond, Latent heat of vaporization, cohesive and adhesive properties of water, surface tension of water, capillarity of water, Tensile strength of water, hydrostatic pressure, Diffusion of water, Fick's first law, Pressure driven bulk flow, Osmosis, Chemical potential of water, osmotic potential, Hoffler diagram, Hydraulic conductivity, aquaporins, water potential and plant growth, water in the soil, field capacity, Permanent wilting point, water movement in symplast and apoplast, root pressure, cohesion-tension theory of sap ascent, xylem cavitation, water loss in plants.
Overview	In the first unit of this module we will study the function of water in plant life and how water moves into and out of plant. In order to understand this we need to study the properties of water and the physical forces that influence water movement. In the second unit we will study the water balance in plants by discussing water status in the soil, water absorption by the roots, water transport through the xylem and water movement from the leaf to the atmosphere. Emphasis in this module will be placed on the sustainable use of water in our society.
Aim	The aim of this module is to emphasize the importance of water in the life of plants and all living organisms and to explore the adaptation of plants to hot, arid conditions.
Learning Outcomes	At the end of this module learners will be able to: • Study the structure and properties of water. • Understand water transport processes. • Learn about water movement in the soil. • Trace the movement of water from the soil to the roots. • Examine how the structure of the xylem contributes to the movement of water

	from the roots to the leaves. • Examine how plants minimize the consequences of cavitation. • Explore the driving force for leaf transpiration and the anatomical features of the leaf that regulates transpiration. • Emphasize the importance of selection of plants in sustainable use of water in agriculture.
Units	Unit 1.1: Water and plant cells. Unit 1.2: Water balance of plants.
Readings	Measuring water potential. http://5e.plantphys.net/article.php?ch=3&id=29 Calculating capillary rise http://5e.plantphys.net/article.php?ch=3&id=25 Green, P. B., and Stanton, F. W. (1967) Turgor pressure: Direct manometric measurement in single cells of *Nitella. Science* 155: 1675–1676. Heydt, H., and Steudle, E. (1991) Measurement of negative pressure in the xylem of excised roots. Effects on water and solute relations. *Planta* 184: 389–396. Malone, M., and Tomos, A. D. (1992) Measurement of gradients of water potential in elongating pea stem by pressure probe and picolitre osmometry. *J. Exp. Bot.* 43: 1325–1331. Irrigation http://5e.plantphys.net/article.php?ch=4&id=38 Leaf transpiration and water vapor gradient.

	http://5e.plantphys.net/article.php?ch=4&id=42 Zeiger, E. (1983) The biology of stomatal guard cells. *Annu. Rev. Plant Physiol.* 34: 441–475. Steudle, E. (2001) The cohesion-tension mechanism and the acquisition of water by plant roots. *Annu. Rev. Plant Physiol. Plant Mol. Biol.* 52: 847-875.
Activity	**Overview** Assignments: 1. What is the importance of the water potential concept in plant physiology? What are the components of water potential? 2. List three unique properties of water that make it such a good medium for cellular functioning, and explain how each property is useful to the plant. 4. How does water move across a largely hydrophobic plasma membrane? 5. Describe the path followed by water from the soil, through the plant and into the atmosphere. Where in the path are the important resistances to water movement? 6. Describe the casparian strip and its function. What is the most important substance in the casparian strip, from the point of view of its function? 7. What is the driving force for the movement of water from the soil to the

	top of a tree and into the atmosphere? 8- Explore the landscape on campus. Do you think that the selection of plants is appropriate for our environment in Lebanon, especially when it come to water use. Based on what you learned in this module what modifications you suggest for sustainable use of water on campus.
Module 2	Transport and Translocation of Solutes
Key Concepts	Mineral nutrition, Essential nutrients, deficiencies and plant disorders, nutrient solutions, soil and plant tissue analysis, treating nutritional deficiencies, mycorrhizal fungi facilitate nutrient uptake by roots, Passive and active transport, chemical potential, diffusion potential, Nernst equation, membrane transport processes, primary and secondary active transport, membrane transport proteins, ion transport in roots.
Overview	In this module we will discuss the essential nutrients of plants along with their deficiencies and associated plant disorders. This is followed by a discussion on treating nutritional deficiencies. In addition, the role of microbes in plant nutrition will be explored. In the second unit of this module we examine passive and active transport of solutes, transport of ions across membrane barriers, membrane transport processes and ion transport in roots.
Aim	The aim of this unit is to explore the overall topic of nutrition in plants along with transport of solutes. The effect of overuse of fertilizers on the ecosystem will be tackled along with solutions to this problem.
Learning Outcomes	At the end of this module learners will be able to: • Recognize essential nutrients, deficiencies, and plant disorders.

	• Learn how to treat nutritional deficiencies. • Discuss the importance of soil properties, root structure and mycorrhizal symbiotic relationships to plant mineral nutrition. • Recognize the difference between passive and active transport of solutes. • Study the factors that influence the passive distribution of ions across a membrane. • Understand membrane transport processes. • Recognize the impact of overuse of chemical fertilizers on the environment.
Units	Unit 2.1: Mineral nutrition Unit 2.2: Solute transport
Readings	Symptoms of deficiency inessential minerals. http://5e.plantphys.net/article.php?ch=5&id=289 Raghothama, K. G. (2000) Phosphorus acquisition; plant in the driver's seat! *Trends in Plant Science* 5: 412-413. Fox, T. C., and Guerinot, M. L. (1998) Molecular biology of cation transport plants. *Annu. Rev. Plant Physiol. Plant Mol. Biol*. 49: 669-696. Baker, A. J. M., and Brooks, R. R. (1989) Terrestrial higher plants which hyperaccumulate metallic elements—A review of their distribution, ecology and phytochemistry. *Biorecovery* 1: 81–126. ABC transporters in plants http://5e.plantphys.net/article.php?ch=6&id=54

	Bush, D. S. (1995) Calcium regulation in plant cells and its role in signaling. *Annu. Rev. Plant Physiol. Plant Mol. Biol.* 46: 95-122. Hedrich, R., and Schroeder, J. I. (1989) The physiology of ion channels and electrogenic pumps in higher plants. *Annu. Rev. Plant Physiol*. 40: 539-56
Activity	**Overview**
	Assignments: some assignments are taken or modified from the textbook. 1. What does a plant need to grow from seed and complete its life cycle? What is the difference between the requirements of a plant and an animal? 2. What is an essential element? How many have been identified? What is the difference between an essential element and a beneficial one? Provide an example of each. 3. What is a nutrient solution? Why is it more convenient to use liquid medium, as opposed to soil, to grow plants in nutritional studies? In nutrient solutions, nitrogen can be supplied as NH_4^+ or NO_3^-. Which one would use in a nutritional study? 4. What is the difference between a macronutrient and a micronutrient? Provide a reason for the inability of plant physiologists to identify micronutrients in early nutritional studies. Why is it difficult to supply iron in nutrient solutions? What is the best way to overcome this difficulty? 5. What is a mineral deficiency? How can a mineral deficiency be

	recognized? How can farmers benefit from nutrient analysis? 6. What is meant by the term "active transport"? What is the difference between "primary" and "secondary" active transport? 7. What is the meaning of the Nernst equation? If the current carried by K^+ ions diffusing through a K^+ channel is plotted against the membrane potential, at what potential will the direction of current reverse? 8. Both membrane channels and carriers show changes in protein conformation. What is the role of such conformation changes (a) in channels, and (b) in carriers? 9. How can the operation of the plasma membrane H^+-ATPase affect (a) the diffusion of K^+ through membrane channels, and (b) the accumulation of sugars from the apoplast into the cell? 10. Overuse of chemical fertilizers in Lebanon is contributing to water and soil pollution. Investigate the extent of this problem. 11. How can we sustainably maintain the fertility of the soil? Based on what you studied in this module, devise a plan to be used by a farmer to achieve this objective.
Module 3	Biochemistry and Metabolism
Key Concepts	Thylakoid reactions, Light as a particle and a wave, absorption spectrum, antenna complex, reaction center complex, quantum yield, Photosystem I and II, enhancement effect, red drop effect, antenna funnels energy to the

	reaction center, Light harvesting complex I and II, electron transport, ATP synthesis by chemiosmotic mechanism. The Calvin cycle, Light regulate the Calvin cycle, Rubisco activity and light, photorespiration, CO2 concentrating mechanisms: C4 carbon cycle and CAM. Pathways of translocation, P. Protein bodies, companion cells, source to sink pathway, pressure flow model, phloem loading and unloading, photosynthate distribution: allocation and partitioning.
Overview	In this module we will discuss the process of photosynthesis in plants, translocation of sugars in the phloem and secondary metabolites and plant defence. In photosynthesis we are going to explore the light reactions and carbon dioxide fixation reactions. Emphasis will be placed on food security and the role of agriculture in sustainable production of food. The translocation of sugars will be discussed with emphasis on accumulating sugars in storage organs to be used as a source of food. Finally we will explore the large number of secondary metabolites produced in plants, their role in plants for defence and the potential sustainable use of these compounds by society in medicine and industry.
Aim	The aim of this module is to appreciate the role of plants as producers of biomass and food. In exploring the biochemistry of the process of photosynthesis, we are interested in sustainably increasing food production to satisfy the need of increasing world population. In exploring the biosynthetic pathways of secondary metabolites, we will be able to tap this great resource to be used in medicine and industry.
Learning Outcomes	At the end of this module learners will be able to: • Study the organization of the photosynthetic apparatus • Comprehend the organization of light-absorbing antenna systems • Examine the organization of the photosynthetic apparatus

	• Understand the mechanisms of electron transport • Study proton transport and ATP Synthesis in the chloroplast • Explore the Calvin cycle • Understand the regulation of the Calvin cycle • Understand the process of photorespiration • Examine the synthesis of starch and sucrose. • Apply what we studied in photosynthesis to sustainably increase food production. • Examine the pathway and patterns of translocation of photosynthates in the phoem. • Discuss Phloem loading and unloading. • Understand the allocation and partitioning of photosynthates. • Explore ways to increase storage of starch in edible portion of the plant. • Discuss the mechanism of by which plants protect themselves against pests. • Emphasize the use of disease and insect resistant plants to reduce the unsustainable use of pesticides.
Units	Unit 3.1: Photosynthesis: the light reactions. Unit 3.2: Photosynthesis: carbon reactions. Unit 3.3: Translocation in the phloem. Unit 3.4: Secondary metabolites and plant defence.
Readings	The distribution of chlorophylls and other photosynthetic pigments. http://5e.plantphys.net/article.php?ch=7&id=67

Chlorophyll biosynthesis.
http://5e.plantphys.net/article.php?ch=7&id=76

Yachandra, V. K., Derose, V. J., Latimer, M. J., Mukerji, I., Sauer, K., and Klein, M. P. (1993) Where plants make oxygen: A structural model for the photosynthetic oxygen-evolving manganese cluster. *Science* 260: 675–679.

Abrahams, J. P., Leslie, A. G. W., Lutter, R., and Walker, J. E. (1994) Structure at 2.8 Å resolution of F_1 -ATPase from bovine heart mitochondria. *Nature* 370: 621–628.

Mayfield, S. P., Yohn, C. B., Cohen, A., and Danon, A. (1995) Regulation of chloroplast gene expression. *Annu. Rev. Plant Physiol. Plant Mol. Biol.* 46: 147–166.

How the Calvin Benson cycle was elucidated.
http://5e.plantphys.net/article.php?ch=8&id=77

Single-cell C4 photosynthesis.
http://5e.plantphys.net/article.php?ch=8&id=421

Badger, M. R., and Price, G. D. (2003) CO_2 concentrating mechanisms in cyanobacteria: Molecular components, their diversity and evolution. *J. Exp. Bot.* 54: 609–622.

Dai, S., Schwendtmayer, C., Schürmann, P., Ramaswamy, S., and Eklund, H. (2000) Redox signaling in chloroplasts: Cleavage of disulfides by an iron-sulfur cluster. *Science* Jan 28, 287: 655–658.

	Partitioning: the role of sucrose-metabolizing enzymes in sinks http://5e.plantphys.net/article.php?ch=10&id=431 Aki, T., Shigyo, M., Nakano, R., Yoneyama, T., and Yanagisawa, S. (2008) Nano scale proteomics revealed the presence of regulatory proteins including three FT-like proteins in phloem and xylem saps from rice. *Plant Cell Physiol.* 49: 767-790. Aoki, K., Suzui, N., Fujimaki, S., Dohmae, N., Yonekura-Sakakibara, K., Fujiwara, T., Hayashi, H. Yamaya, T., and Sakakibara, H. (2005) Destination-selective long-distance movement of phloem proteins. *Plant Cell* 17: 1801–1814. Furch, A. C. U., Hafke, J. B., Schulz, A., and van Bel, A. J. E. (2007) Ca^{2+}-mediated remote control of reversible sieve tube occlusion in *Vicia faba*. *J. Exp. Bot.* 58: 2827-2838. The Shikimic Acid Pathway. http://5e.plantphys.net/article.php?ch=13&id=23 Unraveling the function of secondary metabolites. http://5e.plantphys.net/article.php?ch=13&id=313
Activity	**Overview**
	Assignments: some assignments are taken or modified from the textbook. 1. What is an action spectrum? What is the relationship between the action

	spectrum for photosynthesis and the absorption spectrum of chlorophyll? 2. Photosynthesis in oxygen-evolving organisms is said to involve two distinct photosystems. Describe the two photosystems and provide two lines of experimental evidence that led to their discovery. 3. What is the role of electron transport in oxygen-evolving photosynthesis? Name the final electron donor and final electron acceptor in photosynthesis. Describe the path traveled by an electron in the electron transport process. 4. Describe the process of ATP synthesis at the thylakoid membrane. Name the reactants, the energy source and the role of light in the process. Can ATP synthesis take place in thylakoid membranes kept in the dark? Explain your answer. 5. The term "dark reactions" was used for many years to describe the reactions for incorporating CO_2in photosynthesis. Why was this term considered appropriate at the time and why is it considered inappropriate now? 6. Photorespiration is generally considered to be a wasteful process that decreases the yield of C_3plants. What experiment would you propose to minimize the role of photorespiration in plants? 7. What would be the consequence in each of the following if the thioredoxins in chloroplasts were reduced not by ferredoxin but by NADPH as is the case for their cytosol counterparts? Assume NADPH is

	constant. Explain your answer. A. Rate of starch synthesis. B. Hexose monophosphate pool in chloroplasts in the dark. C. Synthesis of malate in C_4 plants. D. Synthesis of malate in CAM plants assuming an adequate supply of phosphoenolpyruvate. E. Activity of Rubisco. 8. A sucrose molecule has been synthesized in the chloroplast stroma of a mesophyll cell. Describe the path that the sucrose molecule would follow if it is to become part of the sucrose pool in a developing seed. 9. What is a typical velocity of sap moving in the phloem? Can phloem sap move at that velocity by diffusion? 10. Describe the pressure-flow model of translocation in the phloem. Does water move down its water potential gradient in this model? 11. Explain the concepts of source and sink in phloem transport. Leaves are said to be sinks early in development and to become sources as they attain photosynthetic competence. What experiments would you design to study the leaf transition from sink to source? 12. How do secondary metabolites differ from primary metabolites? 13. Discuss the main functions of secondary metabolites in plants and relate these functions to their sites of accumulation in the plant.

	14. What are terpenes, chemically, and how are they synthesized? Give one example each of how mono- and triterpenes serve as feeding deterrents to insects. 15. Apply what you learned in this module to prepare a report on the best practices to produce food sustainably.
Module 4	Growth and Development
Key Concepts	Sporophytic development, embryogenesis, vegetative development, the origins of polarity in embryogenesis, axial polarity of plant, intercellular communication, shoot apical meristem development, root apical meristem development, vegetative organogenesis, types of senesce, programmed cell death.
Overview	This module is concerned with the morphological and anatomical changes during development along with the biochemical and molecular mechanisms underlying these changes. This includes both the vegetative as well as the reproductive phases of the life of plants.
Aim	The aim of this module is to understand the mechanisms that regulate the development of the plant from embryogenesis through vegetative and reproductive stages.
Learning Outcomes	At the end of this module learners will be able to: • Discuss the major stages of sporophytic development. • Study the origins of polarity in embryogenesis. • Understand the function of shoot apical meristem. • Understand the function of root apical meristem. • Discuss the process of vegetative organogenesis • Understand the process of senescence and programmed cell death of plants

Units	Unit 3.1: Growth and development
Readings	Division Plane Determination in Plant Cells - Laurie G. Smith, Division of Biological Sciences, University of California, San Diego (May 2006). http://5e.plantphys.net/article.php?ch=16&id=225 Plant Meristems: A Historical Overview - Ian Sussex, Department of Molecular, Cellular, and Developmental Biology, Yale University (May 2006). http://5e.plantphys.net/article.php?ch=16&id=169 Watanabe, A., Hamada, K., Yokoi, H., and Watanabe, A. (1994) Biophysical and differential expression of cytosolic glutamine synthetase genes of radish during seed germination and senescence of cotyledons. *Plant Mol. Biol*. 26: 1807–1817. Ryu, S. B., and Wang, X. (1995) Expression of phospholipase D during castor bean leaf senescence. *Plant Physiol*. 108: 713–719. McLean, B. G., Hempel, F. D., and Zambryski, P. C. (1997) Plant intercellular communication via plasmodesmata. *Plant Cell* 9: 1043–1054. Bleecker, A. B., and Patterson, S. E. (1997) Last exit: Senescence, abscission, and meristem arrest in *Arabidopsis*. *Plant Cell* 9: 1169–1179.

	Barlow, P. W. (1994) Evolution of structural initial cells in apical meristems of plants. *J. Theor. Biol.* 169: 163–177.
Activity	**Overview**
	Assignments: (some assignments are taken or modified from the textbook) 1- What are the three main stages of sporophytic (that is, diploid generation) development in plants? 2- What are the five stages of embryogenesis in Arabidopsis*?* 3- What essential features of the mature plant are established during embryogenesis, and at what stage in embryogenesis is each feature determined? 4- Using a labeled diagram, show how the apical–basal organization of tissues in Arabidopsis seedlings is derived from earlier embryonic stages. 5- Compare and contrast "position-dependent" cell division patterns during plant embryogenesis with "lineage-dependent" cell division patterns during animal embryogenesis. 6- What is the evidence that the hormone auxin may serve as a signaling agent during plant embryogenesis?

	7- What mutation in Arabidopsis causes the formation of vascular tissue consisting of xylem, but no phloem. 8- Discuss how the intercellular movement of a transcription factor is involved in the differentiation of cortical and endodermal cells in Arabidopsis. 9- What is the primary function of the *CLAVATA* genes, and what type of proteins do they encode? Diagram a model for CLV1 and CLV3 action and regulation at the molecular level. What is the nature of the extracellular signal regulating CLV1?
Module 5	Focus on Climate Change and Sustainability
Key Concepts	.
Overview	One of the major challenges facing our society is forecasting the response of plants and their ecosystems to climate change. The rapid environmental changes caused by humans may cause the extinction of many plant species due to the lack of sufficient genetic diversity to adapt successfully to the rapid environmental changes. In this module we are going to review articles published in a special issue of Plant Physiology [(December 2012, 160 (4)] about pants and climate change. The article provide an overview on the current advances in relation to the response of plants to rapid climate change.
Aim	The aim of this unit is to explore our current understanding of the abrupt changes in climate on the health of plants and their ecosystems along with their impact on society.
Learning Outcomes	At the end of this module learners will be able to: • Recognize the impact of climate change on plant-insect interactions. • Evaluate the influence of climate change on global crop productivity and its effect on society.

	• Recognize the physiological traits for improving heat tolerance in wheat. • Understand the consequences of climate Warming and altered precipitation patterns for plant-insect and multitrophic Interactions. • Know the evolutionary and ecological responses to anthropogenic climate Change: • Discuss therole of plants in the effects of global change on nutrient Availability.
Units	Unit 2.1: \plant insect interactions and climate change. Unit 2.2: Crop productivity and climate change. Unit 2.3: Heat tolerance in wheat. Unit 2.4: Evolutionary and ecological responses to climate change. Unit 2.5: Role of plants in the effects of climate change on nutrient availability.
Readings	Climate Change: Resetting Plant-Insect Interactions *Plant Physiol. 2012 160: 1677-1685. First Published on September 12, 2012; doi:10.1104/pp.112.204750* The Influence of Climate Change on Global Crop Productivity *Plant Physiol. 2012 160: 1686-1697. First Published on October 10, 2012; doi:10.1104/pp.112.208298* Physiological Traits for Improving Heat Tolerance in Wheat *Plant Physiol. 2012 160: 1710-1718. First Published on October 9, 2012; doi:10.1104/pp.112.207753*

	Consequences of Climate Warming and Altered Precipitation Patterns for Plant-Insect and Multitrophic Interactions *Plant Physiol. 2012 160: 1719-1727. First Published on October 5, 2012; doi:10.1104/pp.112.206524* Evolutionary and Ecological Responses to Anthropogenic Climate Change: Update on Anthropogenic Climate Change *Plant Physiol. 2012 160: 1728-1740. First Published on October 5, 2012; doi:10.1104/pp.112.206219* The Role of Plants in the Effects of Global Change on Nutrient Availability and Stoichiometry in the Plant-Soil System *Plant Physiol. 2012 160: 1741-1761. First Published on October 31, 2012; doi:10.1104/pp.112.20878.*
Activity	**Overview**
	1. A group of 2-3 students choose a review article from list of articles above and present it in the class as a PowerPoint presentation.

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

CEN xxx: Environmental Pollution and Control

NDU-Louaize, Faculty of Engineering, DCEE

Fall 2015

Instructor Information

Instructor: Elsy Ibrahim/Sophia Ghanimeh, Assistant Professor

Office Location: Faculty of Engineering, HA 363/HA367

Telephone: Office – +961.9.208427

Office Hours: Tuesday 2:00 – 3:00 p.m./Wednesday 2:00 – 3:00 p.m.

E-mail: eibrahim@ndu.edu.lb/ sghanimeh@ndu.edu.lb

Website:

http://www.ndu.edu.lb/academics/faculty_research/fe/elsy~ibrahim/profile.htm

http://www.ndu.edu.lb/academics/faculty_research/fe/sophia~ghanimeh/profile.htm

Course Identification

Course Number: CEN xxx

Course Name: Environmental Pollution and Control

Course Location: E xxx

Class Times: MWF 1:00 – 2:00 p.m.

Prerequisites: None

Faculty Web Page: http://www.ndu.edu.lb/academics/fe/intro.htm

Course Description/Overview

Concepts and principles to identify and control water, air and noise pollution. This course also provides knowledge on solid waste and hazardous waste management, and the effects of pollution to general health.

Course Learning Objectives

The overreaching goals of this course are to provide:

a) Ability to understand pollution control technologies and insights into basic environmental assessment components

b) Ability to design basic units for the treatment of waste streams and assess their impact on the receiving water body.

c) Ability to design basic facilities for the processing and disposal of municipal solid waste

d) Ability to design basic facilities for the control of air pollution

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Discover correctly the knowledge related to public health and environmental pollution

2. Apply the concept and principles to control or mitigate the environmental pollution appropriately

3. Design systems to control environmental pollution from an engineering perspective

Course Resources

Course Website(s)

- WS1: http://www.epa.org
- WS2: http://ec.europa.eu/environment/index_en.htm
- WS3: http://www.who.org

Required Course Texts and Materials

- Mihelcic and Zimmerman, 2010, *Environmental engineering: fundamentals, sustainability, design*, 1th Edition, John Wiley & Sons, Inc., ISBN-13: 978-0470165058

Optional Course Texts and Materials

- Vesilind, Morgan, and Heine, 2010, Introduction to environmental engineering, Cengage Learning, 3rd edition, ISBN-13: 978-0495295853.
- Metcalf & Eddy, 2003, Wastewater engineering: Treatment and reuse, 4th Edition, McGraw-Hill.
- Tchobanoglous, Theisen, and Vigil, 1993, *Integrated solid waste management: engineering principles and management issues,* McGraw-Hill.

Assignments and Grading Scheme

Grading System

The University uses the following system of grades. This system consists of letter grades with their corresponding numerical ranges (i.e. percentage equivalent, and the 4.0 point maximum).

Grade	Description	Quality Point Value	Percentage Equivalent
A+	Outstanding	4.0	97-100
A	Excellent	4.0	93 - 96
A-	Very Good	3.7	89 - 92
B+	Good	3.3	85 - 88
B	Good	3.0	80 - 84
B-	Good	2.7	77 - 79
C+	Satisfactory	2.3	73 - 76
C	Satisfactory	2.0	70 - 72
C-	Passing	1.7	66 - 69
D+	Passing	1.3	63 - 65
D	Lowest Passing	1.0	60 - 62
F	Failure	0.0	0 - 59

Grading Policy

Grades are based on the following:

Tests (2 tests x 22.5 points each)	45%
Final Exam	30%
Project	20%
Class attendance/participation	5%
Total Points	**100**

Tests and Final Exams (75%): Two tests cover class presentation and assignments. The final exam is comprehensive.

Course Project (20%): Each team project (3 students) will entail analyzing a local environmental problem and/or designing a facility to treat a stream of water, wastewater, solid waste or air, then writing a report (15%) and presenting the significant findings orally (5%).

Class participation (5%): Students are expected to attend all sessions and participate actively in class discussions.

Course Policies

Late Assignments

While understanding that we all are busy with school, work, and family, your decision to register for this course is an indication that you have made it a high priority. Thus, extensions of assignment due dates are given only in extreme situations (death of a close family member, hospitalization, etc.) and require documentation on your part. Otherwise, due dates are fixed and non-negotiable. All assignments should be submitted on or before the assigned due date. Assignments past the due date will not be accepted for full credit. Examples of unreasonable extensions for an assignment include frequent computer malfunctions, outside class-work, or job responsibilities that inhibit meeting the required deadlines. If you anticipate missing a deadline on an assignment, you should send an e-mail to your instructor before the deadline. Unexcused assignments submitted after the due date may be returned ungraded or assigned a lower evaluation. Whether an extension is allowed will be at the instructor's discretion.

Classroom Protocol

Mobile phones should be turned off and out of sight (i.e. not face-up on the desk but preferably inside purses, backpacks, briefcases, etc. or face down on the desk). Phones may not be answered.

Students must attend class with the required material (i.e. original textbook, notebook, pens, etc.).
Once in class, students are expected to remain in class for the entire period.
English must be the only language spoken in class at all times.

Dissability

Any student who feels she/he may need an accommodation due to a disability should contact the instructor privately to discuss those specific needs.

Important Dates to Remember

Test 1: Thursday, December 11, 2014
Test 2: Thursday, February 05, 2015
Project Repot submittal: Monday, January 05, 2015
Project Presentations: Monday, January 12, 2015

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines
1	Sep. 25	Syllabus Introduction : Overview of various chapters
2	Sep. 29	Chemical & Physical Processes
3	Oct. 06	Wastewater Treatment: Physical Processes
4	Oct. 13	Wastewater Treatment: Aerobic Biological Processes
5	Oct. 20	Wastewater Treatment: Anaerobic Biological Processes (sludge treatment)
6	Oct. 27	Water Treatment: Coagulation/Flocculation, Filtration
7	Nov. 3	Water Treatment: Membrane Processes, Disinfection
8	Nov. 10	Water Quality: Oxygen Depletion and Impacts of Nutrients/Pollutants Discharge

9	Nov. 17	Solid Waste Management: Collection and Material Recovery
10	Nov. 24	Solid Waste Management: Collection and Material Recovery
11	Dec. 01	Solid Waste Management: Disposal (Landfilling)
12	Dec. 08	Air Resources Engineering: Criteria Pollutant and Particulate Emission Control
13	Dec. 15	Project Guidance
14	Jan. 05	Built Environment: Sustainable Engineering Design
15	Jan. 08	Introduction to EIA: Local Regulations and EIA Reporting
16	Jan. 12	Project Presentations

Course	Environmental Pollution and Control
Module 1	Water and Wastewater Treatment and Discharge
Key Concepts	Contaminants, Physical/Biological/Chemical Treatment, Oxygen Depletion
Overview	This module introduces the students to main contaminants in water and wastewater and addresses key processes to remove them. The impact of wastes discharge into natural water streams is also considered. Questions to be addressed in this module include the following: How to design a wastewater (secondary) treatment plant? What is the impact of discharging the effluent of a wastewater treatment plant into a nearby water body? How to reduce water turbidity and hardness?
Aim	The students should be able to design the basic components of a wastewater treatment plant (up to the secondary treatment level). They should understand the main concepts of water treatment: coagulation/flocuulation, hardness removal, filtration, membrane processes and disinfection. In addition, the students should be able to calculate the oxygen deficit induced by wastewater disposal and assess its impact, along with the impact of other pollution-related phenomena, on the aquatic fauna and flora.
Learning Outcomes	At the end of this module learners will be able to: • Design a wastewater secondary treatment plant • Identify key water treatment concepts through: identifying the components of physical processing units and calculating dosing requirements in chemical processing units • Quantify the impact of pollution on water streams.

Units	Unit 1.1 Physical and chemical processes Unit 1.2: Wastewater treatment Unit 1.3: Water treatment Unit 1.4: Water quality
Readings	Mihelcic and Zimmerman, 2010, 1th Edition, John Wiley & Sons, Inc., Chapters 3, 4, 11, 10 and 8.
Activity	*Quiz 1: Chemical and Physical Processes* This quiz is crucial to assess the students' assimilation of the newly introduced concepts of chemical and physical processes in environmental design. Unsatisfactory entails revisiting chapters 3 and 4. *Field Trip 1: Water/Wastewater Treatment Plant*
Module 2	Solid Waste Management
Key Concepts	Collection, Material Recovery Facility, Landfill
Overview	This module introduces the students to different waste sources and components. It considers collection, processing and disposal of municipal solid waste with emphasis on material recovery facilities.
Aim	The students should be able to see the big picture of solid waste management and identify its various components.
Learning Outcomes	At the end of this module learners will be able to: • Categorize solid wastes by type and source, identify the different components of waste and calculate waste generation.

	• Design the basic components of a material recovery facility. • Provide basic design requirements of a landfill
Units	Unit 2.1: Waste generation and characterization Unit 2.2: Collection and material recovery Unit 2.2: Disposal
Readings	Mihelcic and Zimmerman, 2010, 1th Edition, John Wiley & Sons, Inc., Chapter 13.
Activity	*Team Project and Presentation* The students are asked to work, in teams of three, on an assigned project that includes a design component toward solving a local environmental problem. A full technical report should be submitted and an oral presentation needs to be delivered (by all team members).

Module 3	Air Pollution Control, Built Environment and Impacts Assessment
Key Concepts	Pollutant Criteria, Sustainable Design, EIA
Overview	This module introduces the students to air pollution and control concepts and addresses key sustainability issues in engineering design. Also, it covers basic processes and reporting components in environmental impact assessments.
Aim	At this stage, the students should be able to link all environmental risks of a project (including water, wastes and air related issues) into one assessment report and know how to incorporate it into their design concepts.
Learning Outcomes	At the end of this module learners will be able to: • Identify air criteria pollutants, their source and impacts • Apply basic concepts for the design of particulate emissions control systems. • Identify key requirements for a sustainable design. • Identify the major constituents of an EIA report
Units	Unit 3.1: Air pollution and particulate emissions control Unit 3.2: Built environment Unit 3.2: Environmental impact assessment
Readings	Mihelcic and Zimmerman, 2010, 1th Edition, John Wiley & Sons, Inc., Chapters 12 and 14.

Activity	*Field Trip 2: Solid Waste Processing and Disposal* This trip should include the material recovery facility and the composting plant in Beirut (the largest in the country), in addition to a local landfill.

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

ENG xxx: Renewable Energy Technologies

NDU-Louaize, Faculty of Engineering, DCEE

Fall 2014

Instructor Information

Instructor: Talal Salem, Assistant Professor
Office Location: Faculty of Engineering E216
Telephone: Office – +961.9.208427
Office Hours: Friday 2:00 – 3:00 p.m.
E-mail: tsalem@ndu.edu.lb
Website: http://www.ndu.edu.lb/academics/faculty_research/fe/salem~talal/profile.htm

Course Identification

Course Number: ENG xxx

Course Name:	Renewable Energy Technologies
Course Location:	E 107
Class Times:	MWF 1:00 – 2:00 p.m.
Prerequisites:	No Prerequistes
Faculty Web Page:	http://www.ndu.edu.lb/academics/fe/intro.htm

Course Description/Overview

Principles of renewable technologies for sustainable future. Process design, energy analysis, engineering economics and environmental assessment of renewable energy systems and techniques and applications of solar, wind, biomass, geothermal, hydro-electric, wave and tidal energy technologies. More emphasis is given to solar energy technologies to convert solar radiation into heat or electricity.

Course Learning Objectives

The overreaching goals of this course are to provide:

a) Ability to recognize the need of renewable energy technologies and their role in the global and local context.
b) Ability to distinguish between the sustainable energy sources and fossil energy sources.
c) Ability to describe the principles of renewable energy production from various renewable sources.
d) Ability to conduct a preliminary evaluation of the performance of an energy conversion system for maximum efficiency

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Learn various aspects of renewable energy technologies in an economic, environmental, and societal context
2. Apply fundamental concepts of engineering to identify the appropriate renewable energy systems required for specific applications.
3. Compare various technologies and propose the best possible energy conversion system for a particular location.

Course Resources

Course Website(s)

- WS1: http://energy.gov/eere/office-energy-efficiency-renewable-energy
- WS2: http://www2.ademe.fr/
- WS3: http://www.epa.gov/statelocalclimate/state/topics/renewable.html

Required Course Texts and Materials

- TX: Schaeffer, J. 2007. *Real Goods Solar Living Sourcebook: The Complete Guide to Renewable Energy Technologies and Sustainable Living*, 30th Anniversary Ed., Gaiam

Optional Course Texts and Materials

Wengenmayr, R., Bührke,T., 2008, *Renewable energy : sustainable energy concepts for the future*, Wiley-VCH, 118 pages (ISBN: 9783527408047).

- Boyle, G., 2004. *Renewable Energy* , 2nd Ed., Oxford University Press, 450 pages (ISBN: 0-19-926178-4).

Assignments and Grading Scheme

Grading System

The University uses the following system of grades. This system consists of letter grades with their corresponding numerical ranges (i.e. percentage equivalent, and the 4.0 point maximum).

Grade	Description	Quality Point Value	Percentage Equivalent
A+	Outstanding	4.0	97-100
A	Excellent	4.0	93 - 96
A-	Very Good	3.7	89 - 92
B+	Good	3.3	85 - 88
B	Good	3.0	80 - 84
B-	Good	2.7	77 - 79
C+	Satisfactory	2.3	73 - 76

C	Satisfactory	2.0	70 - 72
C-	Passing	1.7	66 - 69
D+	Passing	1.3	63 - 65
D	Lowest Passing	1.0	60 - 62
F	Failure	0.0	0 - 59

Grading Policy

Grades are based on the following:

Midterm	30%
Project	30%
Final Exam	30%
Class attendance/participation	10%
Total Points	**100**

Exams (60%): Two exams cover class presentation and assignments. The final exam is comprehensive.

Project (30%): One project covers a local case study

Class participation (10%): Students are expected to attend all sessions and participate actively in class discussion.

Course Policies

Late Assignments

While understanding that we all are busy with school, work, and family, your decision to register for this course is an indication that you have made it a high priority. Thus, extensions of assignment due dates are given only in extreme situations (death of a close family member, hospitalization, etc.) and require documentation on your part. Otherwise, due dates are fixed and non-negotiable. All assignments should be submitted on or before the assigned due date. Assignments past the due date will not be accepted for full credit. Examples of unreasonable extensions for an assignment include frequent computer malfunctions, outside class-work, or job responsibilities that inhibit meeting the required deadlines. If you anticipate missing a deadline on an assignment, you should send an e-mail to your instructor before the deadline. Unexcused assignments submitted after the due date may be returned ungraded or assigned a lower evaluation. Whether an extension is allowed will be at the instructor's discretion.

Classroom Protocol

Mobile phones should be turned off and out of sight (i.e. not face-up on the desk but preferably inside purses, backpacks, briefcases, etc. or face down on the desk). Phones may not be answered.
Students must attend class with the required material (i.e. original textbook, notebook, pens, etc.).
Once in class, students are expected to remain in class for the entire period.
English must be the only language spoken in class at all times.

Dissability

Any student who feels s/he may need an accommodation due to a disability should contact the instructor privately to discuss those specific needs.

Important Dates to Remember

Midterm Exam: Monday, November 03, 2014
Project Repot submittal: Friday, December 19, 2014
Project Presentations: Monday, January 12, 2015

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines
0	Sep. 26	*Syllabus*
1	Sep. 29	*Introduction:* Energy consumption & Demand, Renewable vs fossil energy sources *Overview of Renewable Energy Technologies:* Renewable energy sources, Advantages and benefits, Available technologies and challenges.
2	Oct. 06	*Solar energy:* Solar radiation
3	Oct. 13	*Solar energy:* fundamentals of thermal exchange
4	Oct. 20	*Solar energy:* Solar thermal systems
5	Oct. 27	*Solar energy:* fundamentals of photovoltaic

6	Nov. 03	*Solar energy:* photovoltaic systems
7	Nov. 10	*Biomass and Bioenergy:* Biomass resources
8	Nov. 17	*Biomass and Bioenergy:* Conversion technologies
9	Nov. 24	*Wind energy:* : Resources
10	Dec. 01	*Wind energy:* Turbines and power generating systems
11	Dec. 08	*Geothermal energy:* Resources
12	Dec. 15	*Geothermal energy:* Principles, operation and recovery of energy
13	Jan. 05	*Energy economics*
14	Jan. 12	*Environmental assessments*
15	Jan. 19	*Project*

Course	**Renewable Energy Technologies**
Module 1	Solar Energy
Key Concepts	Solar radiation, Thermal, PV
Overview	The students will be introduced to the fundamentals of solar radiation. The difference between solar thermal (to produce heat) and solar photovoltaic (to produce electricity) will be highlighted. Students have to develop a basic understanding of the impact of various types of modules and their orientations on the choice of the best system to be applied. Questions to be addressed in this module include the following: What is the existent local legislation? Is there any governmental support (incentives) to promote solar energy application? What are the environmental impacts of each solution?
Aim	The overriding aim of this module is to turn students able to suggest the best solar system for a certain application and to be able to do a preliminary design of the solar

	system.
Learning Outcomes	At the end of this module learners will be able to: • Identify the best solar system for a given application. • Conduct a preliminary design of solar systems.
Units	Unit 1.1 An Overview Unit 1.2: Thermal Unit 1.3: Photovoltaic
Readings	Schaeffer, J. 2007. *Real Goods Solar Living Sourcebook: The Complete Guide to Renewable Energy Technologies and Sustainable Living*, 30th Anniversary Ed., Gaiam
Activity	*Assignment 1: Identifying the different types of solar energy systems* 1. Go to the NDU's Library Web Site (www.ndu.edu.lb). Select a reliable reference on renewable energy and write a report up to two pages on the solar applications in buildings.
Module 2	Outdoor Air Pollution Control & Process Design
Key Concepts	Solar, Biomass, Wind, Geothermal
Overview	To select a system to produce heat or electricity from renewable resources, students need to understand the physical properties of different types of systems, and he environmental impact. The available technologies will be presented and discussed.
Aim	The overriding aim of this module is to enhance students' understanding of the renewable energy systems (Solar, biomass, wind and geothermal) used to reduce the dependence on fossil fuel systems.
Learning Outcomes	At the end of this module learners will be able to: • Identify and describe the different types of renewable energy systems. • Select the proper system for a specific application
Units	Unit 2.1: Biomass applications Unit 2.2: Wind energy applications Unit 2.2: Geothermal energy applications

	Unit 2.3: Solar vs. Biomass vs. Wind vs. Geothermal: A comparison
Readings	Schaeffer, J. 2007. *Real Goods Solar Living Sourcebook: The Complete Guide to Renewable Energy Technologies and Sustainable Living*, 30th Anniversary Ed., Gaiam Aldo Da Rosa, A. 2013. *Fundamentals of Renewable Energy Processes* (Third Edition), edited by Academic Press, Boston, 2013, Pages i-ii, ISBN 9780123972194, http://dx.doi.org/10.1016/B978-0-12-397219-4.00019-9.
Activity	*Assignment 2: Sustainable energy project* 1. A group/individual sustainable energy project to suggest and study the feasibility of renewable energy projects across the University campus. 2. Students will closely work with NDU physical plant to seek help on energy related data for their projects 3. Students will have then to perform a short demonstration on this device in class.
Module 3	Energy, Economics and Environmental Assessments
Key Concepts	Economics, EIA
Overview	General design considerations (process flow charts, engineering economics, and cost estimation) will be presented.
Aim	The overriding aim of this module is to expand the students' understandings of and reasoning skills related to renewable energy choices, issues, and policies in the context of the varied social, economic and environmental implications of production, distribution and use.
Learning Outcomes	At the end of this module learners will be able to: • Assess alternative energy sources • Conduct environmental impact assessment for a selected design
Units	*Unit 3.1:* Technical and economical assessment of renewable technology Unit 3.4: Environmental impact assessments and sustainability issues
Readings	Schaeffer, J. 2007. *Real Goods Solar Living Sourcebook: The Complete Guide to Renewable Energy Technologies and Sustainable Living*, 30th Anniversary Ed., Gaiam

Activity	*Assignment 3: Comparative analysis and environmental assessment* 41. Use a multi-criteria approach to assess different options for a specific application considering the energy, economics and environmental impacts 42. Conduct an EIA for the best renewable energy system selected 43. Your findings will be discussed in class using a short presentation (PowerPoint) of five minutes.

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

CEN 462: Environmental Engineering

NDU-Louaize, Faculty of Engineering, DCEE

Fall 2014

Instructor Information

Instructor: Elsy Ibrahim/Sophia Ghanimeh, Assistant Professor

Office Location: Faculty of Engineering, HA 363/HA367

Telephone: Office – +961.9.208427

Office Hours: Tuesday 2:00 – 3:00 p.m./Wednesday 2:00 – 3:00 p.m.

E-mail: eibrahim@ndu.edu.lb/ sghanimeh@ndu.edu.lb

Website:

http://www.ndu.edu.lb/academics/faculty_research/fe/elsy~ibrahim/profile.htm
http://www.ndu.edu.lb/academics/faculty_research/fe/sophia~ghanimeh/profile.htm

Course Identification

Course Number:	CEN 462
Course Name:	Environmental Engineering
Course Location:	E 107
Class Times:	MWF 10:00 – 11:00 a.m.
Prerequisites:	CEN 462 – Environmental Engineering
Faculty Web Page:	http://www.ndu.edu.lb/academics/fe/intro.htm

Course Description/Overview

Quantitative evaluation of the environmental, economic, and technical problems involved in control of pollutants of the air, water, and land.

Course Learning Objectives

The overreaching goals of this course are to provide:

e) Ability to design basic units for the treatment of waste streams and assess their impact on the receiving water body.

f) Ability to design basic facilities for the processing and disposal of municipal solid waste.

g) General understanding of air pollution control technologies and insights into basic environmental assessment components and sustainable design concept.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Acquire the fundamentals of water quality assessment and standards.

2. Learn the basics of water treatment processes.

3. Learn the basics of wastewater treatment processes.

4. Learn the essentials of solid waste collection, treatment, and disposal.

5. Learn the essentials of air pollution emissions and their control.

6. Apply environmental engineering basics and environmental impact assessment to real problems (project).

Course Resources

Course Website(s)

- WS1: http://www.epa.org
- WS2: http://ec.europa.eu/environment/index_en.htm
- WS3: http://www.who.org

Required Course Texts and Materials

- Mihelcic and Zimmerman, 2010, *Environmental engineering: fundamentals, sustainability, design*, 1th Edition, John Wiley & Sons, Inc., ISBN-13: 978-0470165058

Optional Course Texts and Materials

- Vesilind, Morgan, and Heine, 2010, Introduction to environmental engineering, Cengage Learning, 3rd edition, ISBN-13: 978-0495295853.
- Metcalf & Eddy, 2003, Wastewater engineering: Treatment and reuse, 4th Edition, McGraw-Hill.
- Tchobanoglous, Theisen, and Vigil, 1993, *Integrated solid waste management: engineering principles and management issues,* McGraw-Hill.

Assignments and Grading Scheme

Grading System

The University uses the following system of grades. This system consists of letter grades with their corresponding numerical ranges (i.e. percentage equivalent, and the 4.0 point maximum).

Grade	Description	Quality Point Value	Percentage Equivalent
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A-	Very Good	3.7	89 - 92
B+	Good	3.3	85 - 88
B	Good	3.0	80 - 84
B-	Good	2.7	77 - 79
C+	Satisfactory	2.3	73 - 76
C	Satisfactory	2.0	70 - 72
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Grading Policy

Grades are based on the following:

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Project	20%
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Tests and Final Exams (75%): Two tests cover class presentation and assignments. The final exam is comprehensive.

Course Project (20%): Each team project (3 students) will entail analyzing a local environmental problem and/or designing a facility to treat a stream of water, wastewater, solid waste or air, then writing a report (15%) and presenting the significant findings orally (5%).

Class participation (5%): Students are expected to attend all sessions and participate actively in class discussions.

Course Policies

Late Assignments

While understanding that we all are busy with school, work, and family, your decision to register for this course is an indication that you have made it a high priority. Thus, extensions of assignment due dates are given only in extreme situations (death of a close family member, hospitalization, etc.) and require documentation on your part. Otherwise, due dates are fixed and non-negotiable. All assignments should be submitted on or before the assigned due date. Assignments past the due date will not be accepted for full credit. Examples of unreasonable extensions for an assignment include frequent computer malfunctions, outside class-work, or job responsibilities that inhibit meeting the required deadlines. If you anticipate missing a deadline on an assignment, you should send an e-mail to your instructor before the deadline. Unexcused assignments submitted after the due date may be returned ungraded or assigned a lower evaluation. Whether an extension is allowed will be at the instructor's discretion.

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English must be the only language spoken in class at all times.

Dissability

Any student who feels she/he may need an accommodation due to a disability should contact the instructor privately to discuss those specific needs.

Important Dates to Remember

Test 1: Thursday, December 11, 2014
Test 2: Thursday, February 05, 2015
Project Repot submittal: Monday, January 05, 2015
Project Presentations: Monday, January 12, 2015

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines
1	Sep. 25	Syllabus Introduction : Overview of various chapters
2	Sep. 29	Chemical & Physical Processes
3	Oct. 06	Wastewater Treatment: Physical Processes
4	Oct. 13	Wastewater Treatment: Aerobic Biological Processes
5	Oct. 20	Wastewater Treatment: Anaerobic Biological Processes (sludge treatment)
6	Oct. 27	Water Treatment: Coagulation/Flocculation, Filtration
7	Nov. 3	Water Treatment: Membrane Processes, Disinfection
8	Nov. 10	Water Quality: Oxygen Depletion and Impacts of Nutrients/Pollutants Discharge
9	Nov. 17	Solid Waste Management: Collection and Material Recovery
10	Nov. 24	Solid Waste Management: Collection and Material Recovery
11	Dec. 01	Solid Waste Management: Disposal (Landfilling)
12	Dec. 08	Air Resources Engineering: Criteria Pollutant and Particulate Emission Control
13	Dec. 15	Project Guidance
14	Jan. 05	Built Environment: Sustainable Engineering Design
15	Jan. 08	Introduction to EIA: Local Regulations and EIA Reporting

16	Jan. 12	Project Presentations

Course	Environmental Engineering
Module 1	Water and Wastewater Treatment and Discharge
Key Concepts	Contaminants, Physical/Biological/Chemical Treatment, Oxygen Depletion
Overview	This module introduces the students to main contaminants in water and wastewater and addresses key processes to remove them. The impact of wastes discharge into natural water streams is also considered. Questions to be addressed in this module include the following: How to design a wastewater (secondary) treatment plant? What is the impact of discharging the effluent of a wastewater treatment plant into a nearby water body? How to reduce water turbidity and hardness?
Aim	The students should be able to design the basic components of a wastewater treatment plant (up to the secondary treatment level). They should understand the main concepts of water treatment: coagulation/flocuulation, hardness removal, filtration, membrane processes and disinfection. In addition, the students should be able to calculate the oxygen deficit induced by wastewater disposal and assess its impact, along with the impact of other pollution-related phenomena, on the aquatic fauna and flora.
Learning Outcomes	At the end of this module learners will be able to: • Design a wastewater secondary treatment plant • Identify key water treatment concepts through: identifying the components of physical processing units and calculating dosing requirements in chemical processing units • Quantify the impact of pollution on water streams.

Units	Unit 1.1 Physical and chemical processes Unit 1.2: Wastewater treatment Unit 1.3: Water treatment Unit 1.4: Water quality
Readings	Mihelcic and Zimmerman, 2010, 1th Edition, John Wiley & Sons, Inc., Chapters 3, 4, 11, 10 and 8.
Activity	*Quiz 1: Chemical and Physical Processes* This quiz is crucial to assess the students' assimilation of the newly introduced concepts of chemical and physical processes in environmental design. Unsatisfactory entails revisiting chapters 3 and 4. *Field Trip 1: Water/Wastewater Treatment Plant*
Module 2	Solid Waste Management
Key Concepts	Collection, Material Recovery Facility, Landfill
Overview	This module introduces the students to different waste sources and components. It considers collection, processing and disposal of municipal solid waste with emphasis on material recovery facilities.
Aim	The students should be able to see the big picture of solid waste management and identify its various components.
Learning Outcomes	At the end of this module learners will be able to: • Categorize solid wastes by type and source, identify the different components of waste and calculate waste generation.

	• Design the basic components of a material recovery facility. • Provide basic design requirements of a landfill
Units	Unit 2.1: Waste generation and characterization Unit 2.2: Collection and material recovery Unit 2.2: Disposal
Readings	Mihelcic and Zimmerman, 2010, 1th Edition, John Wiley & Sons, Inc., Chapter 13.
Activity	*Team Project and Presentation* The students are asked to work, in teams of three, on an assigned project that includes a design component toward solving a local environmental problem. A full technical report should be submitted and an oral presentation needs to be delivered (by all team members).

Module 3	Air Pollution Control, Built Environment and Impacts Assessment
Key Concepts	Pollutant Criteria, Sustainable Design, EIA
Overview	This module introduces the students to air pollution and control concepts and addresses key sustainability issues in engineering design. Also, it covers basic processes and reporting components in environmental impact assessments.
Aim	At this stage, the students should be able to link all environmental risks of a project (including water, wastes and air related issues) into one assessment report and know how to incorporate it into their design concepts.
Learning Outcomes	At the end of this module learners will be able to: • Identify air criteria pollutants, their source and impacts • Apply basic concepts for the design of particulate emissions control systems. • Identify key requirements for a sustainable design. • Identify the major constituents of an EIA report
Units	Unit 3.1: Air pollution and particulate emissions control Unit 3.2: Built environment Unit 3.2: Environmental impact assessment
Readings	Mihelcic and Zimmerman, 2010, 1th Edition, John Wiley & Sons, Inc., Chapters 12 and 14.

Activity	*Field Trip 2: Solid Waste Processing and Disposal* This trip should include the material recovery facility and the composting plant in Beirut (the largest in the country), in addition to a local landfill.

Course Syllabus

BIO 314:
Ecology
Notre Dame University-Louaize, Faculty of Natural and Applied Sciences, Department of Sciences

Spring Semester, 2013-2014

Instructor Information

Instructor: Dr. Tanos G. Hage
Office Location: S242, Main Campus
Telephone: Office – 09-208725
Office Hours: MWF 1:00-2:00
E-mail: thage@ndu.edu.lb
Website:

Course Identification

Course Number: BIO 314

Course Name:	Ecology
Course Location:	Main Campus
Class Times:	MWF 1:00-2:00
Prerequisites:	None
Faculty Web Page:	http://www.ndu.edu.lb/academics/fnas/deanmess.htm

Course Description

Principles of ecosystems; the interaction of organisms and their environment. Food web, energy flow and nutrient cycling in ecosystems. Factors which affect the distribution and abundance of species, wildlife resources and extinction.

Course Overview

Ecology is the study of the relationships between organisms and their environment. It is a fascinating field that tries to understand nature as a whole, with all its interactions. The scope of ecologists range from an individual organism to the study of global scale processes, such as global warming and ozone depletion. The knowledge gained from ecology helps us understand and design solutions to environmental problems and offers humanity a chance to save our biosphere. In our discussion of ecology we will emphasize the science behind it as well as its societal applications. Since ecologists view biological systems in a hierarchy, we will take this approach in arranging the topics of our discussions. We will start with the ecology of individuals, which is the domain of physiological ecology and behavioural ecology. Population ecology is studied next; this includes adaptation, extinction, distribution and abundance of species and population growth and regulation. This will bring us to the ecology of interactions such as competition, predation and parasitism. Community ecology on the other hand is concerned with factors controlling multispecies systems. Finally the highest level of organization is the ecosystem organization which include the physical and chemical factors influencing the community and focus on subjects such as energy flow and nutrient cycling in nature. Ecologists are concerned not only with communities, populations and organisms *in nature*, but also with manmade or human influenced environments, and with the consequences of human influence *on* nature (pollution, *global climate change*). In fact, our influence is so pervasive that we would be hard pressed to find an environment that was totally unaffected by human activity. Environmental problems are now high on the political agenda and ecologists clearly have a central role to play: a *sustainable future* depends fundamentally on ecological understanding and our ability to predict or produce outcomes under different scenarios.

Course Learning Objectives

The main objectives of this course are to a) learn about the basic mechanisms that are at work in the biosphere thorough understanding of the fundamental concepts that define the field of ecology. b) Use the knowledge gained from the field of ecology to understand the impact of human activities (pollution, global warming and climate change) on the natural systems. c) Emphasize the concept of sustainable development by highlighting the link between socio-economic needs and the environment.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

148. Learn and understand relationships among biotic and abiotic components of the environment.
149. Explore and analyze concepts related to population structure and dynamics, energy flow, nutrient cycling, interactions and succession in ecological communities and apply those concepts to real world problems.
150. Understand how scientists conduct experiments, analyze data and make conclusion about the natural world.
151. Convey scientific literature and express ecological knowledge about living things to others using oral and written communication.
152. Apply concepts learned in ecology to solve real world problems including global warming and climate change.

Course Resources

Required Course Text

M. C. Molles, Jr. (2013) *Ecology: concepts and applications*. Sixth edition, McGraw-Hill publishing company, Boston, MA
There is a website associated with this text. See: www.mmhe.com/molles6e
Hands-out prepared by the instructor, readings and assignments will be posted on blackboard.

Resources Available to Students

Library Resources: NDU Library is open to students to help you in all your research and class work. Qualified personnel are available to help you.
Writing Center: The Writing Center provides assistance to all students who wish to discuss their writing with a trained consultant. The Center is located in HA 114. An appointment is required.
Blackboard (bb) Software: Lecture material, handouts, readings and assignments will be posted on blackboard. If you are not familiar with the Blackboard system, it is recommended to attend a training session at the University Computer Services in order to know how to use the Blackboard system to enrich the academic communication with your instructor and your colleagues.

Field Observation:
Field trip(s) will be planned to visit a natural wild area in Lebanon. You should record all your observations, thoughts and questions in your field journal. Your field observations will be unique to you, reflecting your personal style. For each field trip a report is expected. Includes photos and sketches with your write up.

Grading and Evaluation

Exam I	20%
Exam II	20%
Final exam (comprehensive)	35%
Project and assignments	25%
Total	**100%**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

Classes are a mix of lectures (powerpoint presentations) and discussions. The lecture topic is announced ahead of time for you in order to read assigned material before coming to class. Each lecture begins with a clear and detailed set of learning objectives. After discussing a major concept, multiple choice, and short answer questions are administered in the class to test your understanding and to pinpoint deficient areas of comprehension. This interactive approach requires your active participation. Material and assignments will be posted on blackboard and Connect Ecology-interactive webpage associated with the textbook. Additional readings will be assigned from the literature on specific subjects.

Course Schedule

Week	**Topic** (additional readings are available in the course modules)	Reading
1	Introduction to Ecology: Historical Foundations and Developing Frontiers.	Ch 1
	Natural History and Evolution	
1&2	Life on Land	Ch 2
2	Life in Water	Ch 3
2&3	Population Genetics and Natural Selection	Ch 4
	Adaptation to the Environment	
3	Temperature Relations	Ch 5
4	Water Relations	Ch 6

5	Energy and Nutrient Relations	Ch 7
	Population Ecology	
6	Population Distribution and Abundance	Ch 9
7	Population Dynamics	Ch 10
8	Population Growth	Ch 11
9	Life Histories	Ch 12
	Interactions	
9&10	Competition	Ch 13
10	Exploitation: Predation, Herbivory, Parasitism and disease	Ch 14
11	Mutualism	Ch 15
	Communities and Ecosystems	
12	Species Abundance and Diversity	Ch 16
13	Species Interactions and Community Structure	Ch 17
14	Primary Production and Energy Flow	Ch 18
15	Nutrient Cycling and Retention	Ch 19
16	Succession and Stability	Ch 20

Course Policies
No make-up exam is allowed under normal circumstances. Consequently, a student missing an exam with no justifiable reason will lose the grade value of that exam.
Under abnormal circumstances a student is allowed a make-up exam under the following conditions:
1. The student shows that missing the exam was beyond his/her control.
2. The instructor and chairperson accept the case presented and approve of the make up.
3. The student may lose 10 points out of 100 of the grade value of the exam in question.
4. The make up exam shall be done within 10 days after the elapse of the exam date.

Assignments should be returned by the due date. Failure to do so will result in losing up to 20% of the grade.

Mobile phones should be turned off and out of sight (i.e. not face-up on the desk but preferably inside purses, backpacks, briefcases, etc. or face down on the desk). Phones may not be answered.

Students must attend class with the required material (i.e. original textbook, notebook, pens, etc.).

Once in class, students are expected to remain in class for the entire period.

English must be the only language spoken in class at all times.

Special needs: Any student who feels s/he may need an accommodation due to a disability should contact the instructor privately to discuss those specific needs.

Policies & Procedures

NDU's Attendance Policy
Student should attend all classes and laboratory sessions on time. A pattern of absences, whether authorized or not, and even below the maximum number (specified below), may alter one's grade substantially. The SAO alone authorizes absences. No absence absolves a student from the responsibility of acting upon the material presented during his/her absence. The maximum number absences for classes that meet on MWF is six; the maximum number for classes that meet on TTh and in the summer is four, (or two hours per credit course). Any student whose absences exceed the maximum limits shall automatically fail the course unless the student withdraws.

Office Hours: All instructors at NDU are available for office hours during the week. Please note the office hour that your instructor has dedicated to this course to make an appointment. Just dropping by may not ensure that the professor has set aside time to assist you. Office hours may be used ideally to ask for guidance on an assignment or to ask questions concerning a subject that you were not clear on during class time.

NDU's Academic Integrity Policy

Students are expected and encouraged to be honest and to maintain the highest standards of academic integrity in their academic work and assignments at the University. They shall refrain from any academic dishonesty or misconduct including; but not limited to:

- Plagiarism; that is, the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Also, paraphrasing, summarizing, as well as well as direct quotations are considered as plagiarism, if the original source is not properly cited.
- Cheating.
- Assisting in cheating.
- Substituting a student in the taking of an examination.
- Substituting examination booklets.
- Submitting the same work for more than one course and the like. o Submitting papers written by others.
- Receiving or providing unauthorized help or assistance in any academic work or assignment. Intentional violation of program and degree requirements and regulation as established by the University.
- Dishonest reporting of computational, statistical, experimental, research, results, or the like.

System of Grades

The University uses the following system of grades. This system consists of letter grades with their corresponding numerical ranges (*i.e.* percentage equivalent, and the 4.0 point maximum).

Grade	Description	Quality Point Value	Percentage Equivalent
A^+	Outstanding	4.0	97-100
A	Excellent	4.0	93 - 96
A^-	Very Good	3.7	89 - 92
B^+	Good	3.3	85 - 88
B	Good	3.0	80 - 84
B^-	Good	2.7	77 - 79

C+	Satisfactory	2.3	73 - 76
C	Satisfactory	2.0	70 - 72
C-	Passing	1.7	66 - 69
D+	Passing	1.3	63 - 65
D	Lowest Passing	1.0	60 - 62
F	Failure	0.0	0 - 59
UW	Unofficial Withdrawal	0.0	

The grade "*UW*" is assigned by the instructor when a registered student has never attended a class or has ceased attending and has not submitted an official course withdrawal request to the Office of the Registrar. This grade is computed as an *F* grade in the grade-point average.

Course	Ecology
Module 1	Introduction to Ecology/Natural History and Evolution
Key Concepts	Ecology, biosphere, ecosystem, evolution, soil horizons, biomes, climate diagram, natural history, aquatic environments, hydrologic cycle, adaptation, allele frequency, Hardy-Weinberg principle, natural and artificial selection, genetic drift, population genetics.
Overview	The first unit of this module introduces you to the discipline of ecology, it discusses the levels of ecological organizations and provides a sampling of ecological research performed in the field and/or laboratory. Units 2 and 3 provides an overview of natural history of terrestrial and aquatic environments. Natural history is the study of how organisms in a particular area are influenced by factors such as climate, soil, soils, predators, competitors and evolutionary history. In relation to biomes, large scale patterns of climatic variation is discussed, this includes the construction of climatic diagrams. For each of the different biomes and aquatic ecosystem, geography, climate, soils (for biomes only), biology and human influences are discussed. Evolution is a unifying principle of biology (including ecology) which provides a theoretical framework to study the diversity of life. In this unit, the theory of evolution by natural selection is discussed in detail. In addition topics related to population ecology are discussed, this includes Hardy-Weinberg equilibrium model.
Aim	The aim of this module is to introduce the field of ecology, be exposed to the natural history of the biosphere by discussing biomes and aquatic ecosystems and the impact of humans on them. Finally, an overview of population genetics is presented with emphasis on the theory of evolution by natural selection and the Hardy-Weinberg equilibrium model.

Learning Outcomes	At the end of this module learners will be able to: • Define the term ecology • Comprehend the reasons behind large-Scale patterns of climate variation. • Recognize the importance of soil as the foundation of terrestrial biomes. • Recognize the natural history and geography of biomes. • Assess the impact of humans on terrestrial biomes. • Discuss how technology can contribute to curriculum change. • Understand the hydrologic cycle • Recognize the natural history of aquatic environments • Assess the impact of humans on aquatic environments • Explain the theory of evolution by natural selection • Apply the Hardy-Weinberg model to identify evolutionary forces.
Units	Unit 1.1: Introduction to ecology: historical foundations and developing fron Unit 1.2: Life on land Unit 1.3: Life in water Unit 1.4: Populations genetics and natural selection
Readings	Norris R.D., P. P. Marra, T. K. Kyser, and L. M. Ratcliffe. 2005. Tracking habitat use of a long distance migratory bird, the American *redstart Setophaga rutcilla*, using stable-carbon isotopes in cellular blood. Journal of Avian Biology 36:164-70. Nadkarni, N. M. 1981. Canopy roots: convergent evolution in rainforest nutrient cycles. Science 214:1023-24. Janzen, D. H. 1981. Guanacaste tree seed-swallowing by Costa Rican range horses. Ecology 62:587-92.

	Clausen, J., D. D. Keck, and W. M. Hiesey. 1940. Experimental studies on the nature of species. I. The effect of varied environments on Western North American Plants. Washington, D.C.: Carnegie Institution of Washington, Publication no. 520. Vila-Aiub, M. M., M. C. Balbi, P. E. Gundel, C. M. Ghersa, and S. B. Powles. 2007. Evolution of glyphosate-resistent Johnsongrass (*Sorghum halepense*) in glyphosate-resistant soybean. Weed Science 55:566-71.
Activity	**Overview** *Assignments:* 1- Pick a research article related to ecology from a refereed scientific journal and outline the different steps of the scientific method used by the author(s). (Information, question, hypothesis, prediction, test of hypothesis) 2- Construct climate diagram for the different regions of Lebanon (Beirut, Tripoli, Bekaa, Besharee). How are they different? Can you predict the type of biome of each region? Data for each location is provided on BlackBoard. 3. Construct a table for the different terrestrial biomes on earth and indicate the main features related to geography, climate, soils, biology, and human influences, for each biome. 4-Construct a table for the different aquatic environments and indicate the main features related to geography, structure, physical conditions, chemical conditions, biology and human influences.

	5- Construct a concept map for chapter 4, populations genetics and natural selection. 6- Solve the set of problems related to Hardy-Weinberg model. The problems are posted on blackboard. 7- Investigate the environmental threats to the Cedar forest of Bsherri in Lebanon. Deatail some of the conservation efforts undertaken to protect this forest.
Module 2	Adaptation to the Environment
Key Concepts	Acclimation, ectotherm, endotherm, homeotherm, Poikilotherm, macroclimate and microclimate, photosynthesis, thermal neutral zone, hyperosmotic, hypoosmotic, isoosmotic, osmoregulation, relatie humidity, water potential, autotroph, chemosynthetic autotroph, heterotroph, detritivore, Mullerian and batesian mimicry, fuctional response, optimal foraging theory.
Overview	In this unit we examine the relationships between organisms and temperature. This discussion has a practical application in view of the rapidly changing climate. Water is essential for all forms of life on earth. Most organisms must expand energy to maintain their internal water. Hence the study of water relations is fundamental to living organism especially for desert organisms. In order to survive organisms must obtain energy from their environment. Autotrophs use solar energy or inorganic chemicals. However, heterotrophs must obtain energy from the food they consume. The study of energy and nutrient relations addresses this subject.

Aim	The aim of this unit is to explore adaptations to environments in relation to temperature, water, nutrient and energy relations.
Learning Outcomes	At the end of this module learners will be able to: • Learn about microclimates and the factors that influence it. • Understand evolutionary trade-offs. • Characterize the performance of organisms in relation to temperature. • Explain how organisms regulate their body temperature. • Explain how organisms survive extreme temperatures. • Recognize water availability in different compartment.s • Discuss water regulation on land. • Understand water and salt balance in aquatic environments. • Learn about photosynthetic autotrophs, chemosynthetic autotrophs and heterotrophs. • Explain the optimal foraging theory. • Apply the concept of energy and nutrient relations: Bioremediation
Units	Unit 2.1: Temperature relations Unit 2.2: Water relation Unit 2.3: Nutrition and energy relations
Readings	Bennett, A. F. And R. E. Lenski. 2007. An experimental test of evolutionary trade-offs during temperature adaptation. Proceedings of the National Academy of Sciences of the United states. 104 supplement 1:8649-54. Baur, B. And A. Baur. 1993. Climatic warming due to thermal radiation from an urban area as possible cause for the local extinction of a landsnail. Journal of Applied Ecology 30:333-40. Toolson, E. C. And N. F. Hadley. 1987. Energy-dependent facilitation of transcuticular water flux contributes to evaporative cooling in the sonoran desert

	cicada, Diceroprocta apache (Homoptera, Cicadidae). Journal of Experimental Biology 131:439-44. Tracy, R. L. And G. E. Walsberg. 2002. Kangaroo rats revisited: re-evaluating a classic case of desert survival. Oecologia 133:449-57. Watwood, M. E. And C. N. Dahm. 1992. Effects of aquifer environmental factors on biodegradation of organic contaminants. In Proceedings of the International Tropical Meeting on Nuclear and Hazardous Waste Management Spectrum '92. La Grange Park, III.:American Nuclear Society. White, C. S. And J. T. Markwiese. 1994. Assessment of the potential for *in situ* bioremediation of cyanide and nitrate contamination at a leach mine in central New Mexico. Journal of Soil Contamination 3:271-83.
Activity	**Overview**
	Assignments: some assignments are taken or modified from the textbook. 1- Many species of plants and animals that are associated with boreal forests also occur on mountains far to the south of the boreal forests. Using what you have learned about microclimates predict how aspect and elevation would influence their distributions on these southern mountains. 2- J. L. Mosser and colleagues found that populations of the bacterium *Sulfolobus* living at different temperatures has different optimal temperatures for sulfur oxidation. Use natural selection to explain these patterns. Design an experiment to test your explanation. Assume you can create artificial springs and regulate their temperature as you like. 3- Distinguish among vapor pressure deficit, osmotic pressure, and water

	potential. How can all three phenomena be expressed in the same units of measure: pascals. 4- Why are plants such as mosses living in the understory of a dense forest, which show higher rates of photosynthesis at low irradiance, unable to live in environments where they are exposed to full sun for long periods of time? 5- In type 3 functional response, what mechanisms may be responsible for low rates of food intake – compared to type 1 and type 2 functional response- at low food densities? 6- The data of Iriarte and colleagues suggest that prey size may favor a particular body size among pumas. However, this variation in body size also correlates well with latitude; the larger pumas live at high latitudes. Consequently, this variation in body size has been interpreted as the result of selection for efficient temperature regulation. Homeothermic animals are often larger at high latitudes, a pattern called Bergmann's rule. Larger animals, with slower surface area relative to their mass, would be theoretically better at conserving heat. Smaller animals, with higher surface area relative to their masss, would be theoretically better at keeping cool. So what determines predator size? Is predator size determined by climate, predator-prey interactions, or both? Design a study of the influence of the environment on the size of homeothermic predators.
Module 3	Populations Ecology
Key Concepts	Regular, random and clumped distributions, niche, age distribution, birth and death rate, cohort life table, geometric rate of increase, life table, numerical response, survivorship curve, carrying capacity, geometric and

	exponential population growth, reproductive effort, ruderal, semelparity, phenology, k selection.
Overview	In this section we are going to study aspects related to populations: a) population distribution and abundance. b) population dynamics which is concerned with factors influencing the expansion, decline, or maintenance of population. d) population growth. e) life histories which consists of the adaptations of an organism regarding the offsprings it produces, its survival, its age and size at reproductive maturity. Population studies is a key to manage wildlife, control pest populations and save endangered species.
Aim	The aim of this module is to understand the principles of population ecology and be able to apply these principles to real life applications. Population ecology holds the key to saving endangered species, manage wildlife and forests, understand and control disease epidemics.
Learning Outcomes	At the end of this module learners will be able to: • Learn about the effect of the environment on the distribution of species. • Recognize the factors that affect the distribution patterns of individuals within populations on small and large scales. • Apply the concepts learned to assess the level of rarity and vulnerability to extinction of populations. • Comprehend the influence of population dispersal on distribution and abundance. • Understand the temporal dynamics of populations by focusing on patterns of survival and reproduction in populations. • Apply the concepts learned in population dynamics to assess the impact of human generated pollutants on ecosystems. • Examine exponential and geometric growth • Study the effect of the environment on population growth. • Study the history, current state and projected growth of human

	population. • Recognize life histories: the adaptations of organisms that influence the number of offspring it produces, its survival, its size and age at reproductive maturity. • Apply the concepts learned in life histories to restore riparian forests.
Units	Unit 3.1: Population distribution and abundance *Unit 3.2: Population dynamics* Unit 3.3: Population growth Unit 3.4: Life histories
Readings	Huchinson, G. E. 1959. Homage to Santa Rosalia or Why are there so many kinds of animals? Amrican Naturalist 93:145-159. Caughley, G., J. Short, G. C. Grigg, and H. Nix. 1987. Kangaroos and climate: an analysis of distribution. Journal of Animal Ecology 56:751-761. Winston, M. L. 1992. Biology an management of Africanized bes. Annual Review of Entomology 37: 173-93. Hengeveld, R. 1988. Mechanisms of biological invasions. Journal of Biogeography 15:819-828. U.S. Bureau of the Census, International Database. http://www.cencus.gov/pub/ipc/www/idbnew.html Turner, T. F. and J. C. Trexler, 1998. Ecological and historical associations of gene flow in darters (Teleostei:Percidae). Evolution 52:1781-1801.

	Braatne, J. H., S. B. Rood, and P. E. Heilman. 1996. Life history, ecology and conservation of riparian cotton woods in North America. In R. F. Stettler, J. H. D. Bradshaw, P. F. Heilman, P. E. and T. M. Hinckley, eds. Biology of Populus and Its Implications for conservation and management. Ottawa: NRC Research Press.
Activity	**Overview**
	Assignments: some assignments are taken or modified from the textbook. *1- Cedars of Lebanon (Cedrus libani) occurs throughout the western chains of mountains in Lebanon. a) Check the literature and draw a map of their distribution. How do altitude and aspect affect their distribution? Are any populations of cedars of Lebanon found above an altitude of 2000 m. If not justify your answer. In the mountains of Turkey cedars of Lebanon can grow at much higher altitudes. Speculate the reason behind this difference.* *2- Suppose one plant reproduces almost entirely from seeds, and that its seeds are dispersed by wind, and a second plant reproduces asexually, mainly by budding from runners. How should these two different reproductive modes affect local patterns of distribution seen in populations of the two species?* *3- How might energy and nutrient relations explain the lower population densities of birds compared to comparable-sized mammals.* *4- The world population is increasing at an alarming rate. Explain the impact of this rapid growth on the environment and on sustainable development. On what basis the carrying capacity of the earth is calculated?* *5- Why do many populations of exotic species, such as zebra mussels, Eurasian collared doves and tree of heaven, often grow at an exponential rate for some*

	time following their introductions into a new environment? *6- The discussion of seed size and number of focused on the advantages associated with large seeds. However, researchers revealed that the plants from widely separated geographic regions produce a wide variety of seed sizes. If this variation is to be maintained, what are some of the advantages associated with producing small seeds?*
Module 4	Interactions
Key Concepts	Interspecific and intraspecific competition, competitive exclusion principle, exploitation, predation and herbivory, parasites and pathogens, facultative and obligate mutualism.
Overview	This module introduces the ecology of interactions by bringing biological components together. Evolutionary effects of interactions on the species will be addressed. This unit also explores the effect of interactions on the structure of the population and on properties of the ecological communities. Practical applications learned from the ecology of interactions include the study of human disturbance on ecosystems, biological pest control and the modification of food webs by humans.
Aim	The aim of this module is to introduce the major concepts related to the biology of interactions and their applications in everyday life such as biological pest control and control of invasive species.
Learning Outcomes	At the end of this module learners will be able to: • Compare and contrast intraspecific and interspecific competition. • Discuss the competitive exclusion principle. • Explain the effect of competition on the ecological and evolutionary influences on the niches of a species.

	• Understand the mechanisms allowing invasive species to invade communities of native species. • Recognize the extent of exploitative interactions in an ecosystem. • Appreciate the value of pest control by predators. • Explore mutualisms in nature. • Evaluate the benefit of mutualisms in agriculture.
Units	Unit 3.1: Competition Unit 3.2: Exploitative interactions Unit 3.3: Mutualism
Readings	1- Byers, J. E. 2000.Competition between two estuarine snails: implications for invasions of exotic species. Ecology 81:1225-12239. 2- Bryers, J. E. and L. Goldwasser. 2001. Exposing the mechanism and timing of impact of nonindigenous species on native species. Ecology 82:1330-1343. 3- Lindstrom, E. R., H. Andren, P. Angelstam, G. Cederlund, B. Hornfeldt, L. Jaderberg, P. A. Lemnell, B. Martinsson, K. Skold, and J. E. Swenson. 1994. Disease reveals the predator: sarcoptic mange, red fox predation, and prey populations. Ecology 75:1042-1049. 4- Krebs, C. J., R. Boonstra, S. Boutin, and A. R. Sinclair. 2001. What drives the 10-year cycle of snowshoe hares? BioScience 51:25-36. 5- Kalka, M. B., A. R. Smith, and E. k. V. Kalko. 2008. Bats limit arthropods and herbivory in a tropical forest. Science 320:71. 6- Isack, H. A. and H. U. Reyer. 1989. Honeyguides and honey gatherers: interspecific communication in a symbiotic relationship. Science 243:1343-1346.

Activity	**Overview**
	Assignments: (some assignments taken or modified from the textbook) 1- The competitive exclusion theory states that two species cannot occupy the same nice indefinitely. What is the a fundamental assumption of this principle. 2- Do resources have to be present in limited supplies for competition to shape niches? 3- Can we conclude that interspecific competition commonly restricts species to realized niches in nature, based on the results of mathematical models and laboratory experiments? 4- One of the conclusions that seems justified in light of several decades of studies of interspecific competition is that competition is a common and a strong force operating in nature, but not always and not everywhere. List the environmental circumstances in which you think intraspecifc and interspecific competition would be most likely to occur in nature. In what circumstances do you think competition is least likely to occur? How would you go about testing your ideas? 5- How could you test experimentally for the combined influence of bats and birds on numbers of arthropods on foliage, as well as their individual contributions? (Check the paper of bats in the list of references for this unit).

	6- Both mathematical and laboratory models offer valuable insights into the dynamics of predator-prey systems. What are some advantages and limitations of each approach? 7- predation is one of the processes by which one organism exploits another. Others are herbivory, parasitism, and disease. What distinguishes each of these processes, including perdation, from the others? We can justify discussing these varied processes under the heading of exploitative interactions because each involves one organism making its living at the expense of another. By what "currency" would you measure that expense (e. g., energy, fitness)?
Module 5	**Communities and Ecosystems**
Key Concepts	Species diversity and evenness, community structure, commensalism, dominant or foundation species, food web, keystone species, ecological efficiency, net primary and secondary production, trophic level, decomposition, mineralization, eutrophication, nutrient cycling, climax community, pioneer community, primary and secondary succession.
Overview	In this unit we are going to discuss communities and ecosystems. Communities are composed of interacting species and their study is concentrated on the organisms inhabiting an area. However, the study of ecosystems includes the physical and chemical factors influencing the community as well, such as nutrient cycling and energy flow. Practical applications to community ecosystem ecology include: disturbance by humans to ecosystems, human modifications of foodwebs, altering aquatic ecosystems (eutrophication).
Aim	The aim of this unit is introduce the major principles and concepts related to community and ecosystem ecology.

Learning Outcomes	At the end of this module learners will be able to: • Recognize the factors affecting species abundance and diversity. • Study the effect of disturbance on promoting higher diversity. • Understand the effect of human activities on species diversity and abundance in urban areas. • Discuss the importance of food webs. • Evaluate the importance of keystone species. • Comprehend the factors limiting terrestrial primary productivity. • Define the trophic levels and energy flow in an ecosystem. • Discuss nutrient cycling and retention in an ecosystem. • Examine ecosystem changes during succession. • Evaluate the impact of invasive species on plant succession.
Units	Unit 5.1: Species abundance and diversity Unit 5.2: Species interactions and community structure Unit 5.3: Primary production and energy flow Unit 5.4: Nutrient cycling and retention Unit 5.5: Succession and stability
Readings	1- Lebo, M. E., J. E. Reuter, C. R. Goldman, N, C. L. Rhodes, N. vucinich, and D. Mosely. 1993. Spatial variations in nutrient aand particulate matter concentrations in Pyramid lake, Nevada, USA, during a dry period. Canadian Journal of Fisheries and aquatic Science 50:1045-1054. 2- Lilleskov, E. A., T. J. Fahey, T. R. Horton, and G.M. Lovett. 2002. Belowground ectomycorrhizal fungal community changes over a nitrogen deposition gradient in Alaska. Ecology 83:104-115. 3- Blair, R. 2004. The effects of urban sprawl on bids at multiple levels of biological organization. Ecology and Society 9:2 [online].

4- Tscharntke, T. 1992. Cascade effects among four trophic levels: bird predation on galls affects density-dependent parasitism. Ecology 73:1689-1698.

5- Orrock, J. L., M. S. Witter, and O. J. Reichman. 2008. Apparent competition with an exotic plant reduces native plant establishment. Ecology 89-1168-1174.

6- Kaspari, M., S. O'Donnell, and J. R. Kercher. 2000. Energy, density, and constraints to species richness: ant assemblages along a productivity gradient. American Naturalist 155:280-293.

7- Sala, O. E., W. J. Parton, L. A. Joyce, and W. K. Laurenroth. 1988. Primary production of the central grassland regions of the United States. Ecology 69:40-45.

8- Gallardo, A. and J. Merino. 1993. Leaf decomposition in two Mediterranean ecosystems of southwest Spain: influence of substrate quality. Ecology 74:152-161.

9- Takyu, M., S. I. Aiba, and K. Kitayama. 2003. Changes in biomass, productivity and decomposition along topographical gradients under different geological conditions in tropical lower montane forests on Mount Kinabalu, Borneo. Oecologia 134:397-404.

10- Pickett, S. T. A., M. L. Cadenasso, J. M. Grove, P. M. Groffman, L. E. Band, C. G. Boone, W. R. Burch Jr., C. S. B. Grimmond, J. Hom, J. C. Jenkins, N. L. Law, C. H. Nilon, R. V. Pouyat, K. Szlavecz, P. S. Warren, and M. A. Wilson.

	2008. Beyond urban legends: an emerging framework of urban ecology, as illustrated by the Baltimore Ecosystem Study. BioScience 58:139-150. 11- Chapin, F. S., III, L. R. Walker, C. L. Fastie, and L. C. Sharman. 1994. Mechanisms of primary succession following deglaciation at Glacier Bay, Alaska. Ecological Monographs 64:149-75.
Activity	**Overview**
	Assignments: some assignments are taken or modified from the textbook. 1- Suppose you discover that the fish species inhabiting small, isolated patches of coral reef use different vertical zones on the reef face- some species live down near the sand, some live a bit higher on the reef, and some higher still. Based on this pattern of zonation, can you predict how reef structure should affect the diversity of fish living on such reefs? 2- If disturbance can foster higher species diversity, why is human disturbance often (though not always) associated with reduced species diversity? 3- According to the intermediate disturbance hypothesis, could human disturbance sustain higher levels of species diversity than in the absence of human disturbance? 4- Humans have been living in the tropical rain forests of the New World for at least 11,000 years. During this period, disturbance by humans has been a part of these tropical rain forests. Use the intermediate disturbance hypothesis to explain how recent disturbances threaten the biological diversity of these

	forests, while earlier disturbances apparently did not. 5- Some paleontologists have proposed that overhunting caused the extinction of many large North American mammals at the end of the Pleistocene about 11,000 and 10,000 years ago. The hunters implicated by paleontologists were a newly arrived predatory species, *Homo sapiens*. Offer arguments for and against this hypothesis. 6-The studies of nutrient limitations of aquatic primary production that we reviewed in class focused almost entirely on lakes within the temperate zone. Suppose you are an ecologist interested in determining whether primary production in tropical lakes is subject to similar control by nutrient availability. Design a study to find out what controls rates of primary production in tropical lakes. Use all the sources of information at your disposal, including published research, surveys of natural variation, and large- and small-scale experiments. 7- The concentration of atmospheric CO_2, which continues to rise, has been associated with an increased lignin content of the leaves of some plant species. Why is this potential change in leaf chemistry, in response to increased atmospheric CO2, an active area of research by ecosystem ecologists? 8- Many rivers around the world have been straightened and deepened to improve conditions for navigation. Side effects of these changes include increased average water velocity and decreased movement of water into shallow riverside environments such as marginal wetlands. What are the probable influences of these changes on the nutrient spiraling length? Use the model discussed by Newbold in the textbook.

	9- Succession seems to lead to predictable changes in community and ecosystem structure. Predict the characteristics of a frequently disturbed community/ecosystem. What do your predictions suggest about a future biosphere increasingly disturbed by a growing human population? How does the intermediate disturbance hypothesis figure into your answer?
Module 6	**Global warming and Climate change**
Key Concepts	Applied ecology, global distribution of climate change, Impact of climate change on biodiversity and ecosystems.
Overview	One of the biggest future challenges to organisms, ecologists and resource managers is global climate change. Attempts to mitigate predicted changes to climate have an ecological dimension (e.g. plant more trees to soak up some of the extra carbon dioxide produced by the burning of fossil fuels), although mitigation must also focus on the economic and sociopolitical dimensions of the problem. This is discussed because the relevant issues relate to ecosystem functioning. In this module we deal with the way we can use knowledge about the ecology of individual organisms to predict and manage the consequences of global climate change such as the spread of disease and weeds and the positioning of conservation reserves. Given the pressing environmental problems we face, it is not surprising that a large number of ecologists now perform research that is applied (i.e. aimed directly at such problems) and then publish it in specialist scientific journals.
Aim	The aim of this unit is to use knowledge gained in the field of ecology to help solve problems associated with climate change.
Learning Outcomes	At the end of this module learners will be able to: • Understand how to use the knowledge gained in ecological research to predict and manage the consequences of global climate change.

	• Study the impact of climate change on biodiversity • Examine the impact of climate change on the spread of disease • Study the impact of climate change on the spread of invasive species. • Explore how predicted global climate change is expected to affect species' distribution patterns.
Units	Unit 5.1: The global distribution of climate change Unit 5.2: Can the biota keep up with climate change? Unit 5.3: the challenge of global climate change Unit 5.4: The impact of climate change on biodiversity and ecosystems Unit 5.5: the impact of climate change on health Unit 5.6: Adaption of living organisms to climate change.
Readings	1- Beaumont, L.J. & Hughes, L. (2002) Potential changes in the distributions of latitudinally restricted Australian butterfly species in response to climate change. *Global Change Biology*, 8, 954–971. 2- Corn, P.S. (2003) Amphibian breeding and climate change: importance of snow in the mountains. *Conservation Biology*, 17, 622–625. 3- Ehleringer, J.R., Sage, R.F., Flanagan, L.B. & Pearcy, R.W. (1991) Climate change and the evolution of C4 photosynthesis. *Trends in Ecology and Evolution*, 6, 95–99. 4- Kriticos, D.J., Sutherst, R.W., Brown, J.R., Adkins, S.W. & Maywald, G.F. (2003) Climate change and the potential distribution of an invasive alien plant: *Acacia nilotica* spp. *indica* in Australia. *Journal of Applied Ecology*, 40, 111–124.

	5- Law, B.E., Thornton, P.E., Irvine, J., Anthoni, P.M. & van Tuyl, S. (2001) Carbon storage and fluxes in ponderosa pine forests at different developmental stages. *Global Climate Change*, 7, 755–777.
Activity	**Overview**
	Assignments: some assignments are taken or modified from the textbook. 1- would you favor building more nuclear power plants to reduce CO2 emissions? Why or why not? 2- Many people don't believe climate change is going on even though climate scientists have amassed a great deal of data to demonstrate it. What factors do you think influence the degree to which a person believes or doesn't climatologists' reports? 3- What is the impact of climate change on biodiversity, forestry and agriculture in Lebanon? 4- What is the difference between climate change and climate variability?4-

Student Practicum Placement

In this course you will be assigned a practicum to integrate the knowledge acquired in class to real life applications. The practicum is a short term supervised work with the assigned facility/institution. This will give you an opportunity to use your skills, knowledge and experiences in the real world and open your eyes to face new challenges that may arise in the future.

Practicum 1:

A ROCHA Lebanon, NGO.

A ROCHA Lebanon, is an NGO that was established in 1996 with the main objective of saving Ammiq wetlands in the Beqaa valley in Lebanon from destruction. The work of A ROCHA Lebanon currently focuses on three main areas: scientific studies, practical conservation, and environmental education.
After finishing your practicum with A ROCHA Lebanon, the following are expected of you:

4- You should be familiar with the overall activities related to environmental conservation.
5- More specifically, you should participate in the work done to protect migratory birds. You should be able to integrate knowledge gained in class to propose solutions to problems facing migratory birds.
6- At the end of the practicum you will write a report and give a presentation, emphasizing what you have learned from the practicum.

Practicum 2:

Organic farms in the area of Zouk Mikayel

In this practicum you will spend time with the managers of the organic vegetable farms in the area of Zouk Mikayel. You will have to familiarize yourself, and report all the cultural practices utilized in the above operations. Most importantly, you have to emphasize and document sustainable practices, like biological control of pests and maintaining the health and fertility of the soil. In your report and presentation you have to compare and contrast organic vs conventional farms and highlight the importance of sustainable practices to improve the quality of life of the society and individuals.

Practicum 3:

Ministry of Agriculture-Forestry section

The forestry sector in Lebanon is under major environmental threat that are caused by human activities, such as forest cutting and fires. After finishing your practicum at the ministry you should be able to draw a clear picture of the current status of forests in Lebanon and future plans to conserve these forests. Most importantly, you should apply the principles and concepts learned in class to conserve and use this precious natural resource sustainably. A report and a presentation are required to showcase what you have learned from this practicum.

Practicum 4:

Shouf Cedar Reserve

The Shouf Cedar Reserve is the largest nature reserve in Lebanon that covers approximately 5% of the area of Lebanon. This reserve is a haven for biodiversity. The following are the main objectives of the reserve which focuses on sustainable development of the local community:

- Natural and cultural heritage conservation of the region
- Research and monitoring
- Eco-tourism
- Environmental awareness
- Capacity building

After finishing your practicum you should write a report and give a presentation emphasizing the sustainable practices done to protect and develop the area of the resrve. Also you should integrate what you have learned in class to conserve the area using the principles of sustainability.

Practicum 5:

Ministry of the Environment

The world is facing a real threat due to climate change and global warming. The Lebanese Ministry of the Environment is conducting studies, in collaboration with UN agencies, related to emissions of greenhouse gases in Lebanon and exploring new adaptation strategies to reduce the impact of climate change and global warming on society.
After finishing this practicum you should be familiar with the work done related to the above issue. You are also required to write a report and give a presentation emphasizing the concepts learned in class and how it can be applied to reduce the impact of climate change and global warming.

Course Syllabus

BIO 324
Plant Physiology
Notre Dame University-Louaize, Faculty of Natural and Applied Sciences, Department of Sciences
Spring Semester, 2014-2015

Instructor Information

Instructor:	Dr. Tanos G. Hage
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Course Identification

Course Number:	BIO 324

Course Name:	Plant Physiology
Course Location:	FA 1032
Class Times:	MWF 9:00 – 10:00/F 13:00 – 15:00
Prerequisites:	BIO 212 and BIO 227
Faculty Web Page:	http://www.ndu.edu.lb

Course Description

This course covers the basic principles of plant physiology, the physiological processes of green plants and the effect of the environment on these processes. Prerequisite: BIO 212, BIO 227.

Course Overview

This is an introductory, undergraduate course in Plant Physiology. Plants are unique organisms that can manufacture their own food (biomass) from carbon dioxide, water and sunlight. In turn other organisms are dependent on this food for survival, including humans. Plants play a crucial role in our life by providing animals and humans with food, feed, paper, medicine, chemicals, energy, and beautiful landscapes. In addition plants provide ecological services such as regulation of the water cycle and climate, soil formation, nutrient recycling and air purification. Plant physiology is the study of the organization and operations of the processes in the plant that order its development and behavior. Simply put it is the study of plant functions. In this course we will concentrate on transport and translocation of water and solutes, Biochemistry and metabolism, and brief account on growth and development. Throughout the course, and in particular towards the end, concepts related to climate change and sustainability will be emphasized.

Course Learning Objectives

The main objectives of this course are to a) Gain a thorough understanding of the functioning of the plants in their environment b) Develop critical thinking skills to ask pertinent questions related to plant physiology and to go about seeking answers to those questions. c) Use the knowledge gained from Plant Physiology to understand the role of plants in ecosystems. c) Emphasize the concept of sustainable development and climate change by highlighting the link between plants, socio-economic needs and the environment.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

153. Appreciate the important role of plants in the ecosystem and the services rendered to other organisms, including humans.
154. Understand the unique physical properties of water, the concept of water potential and its application to cell-water relations.
155. Demonstrate in-depth an understanding of the physiological processes involved in water balance in plants.
156. Describe how plants obtain and use mineral nutrients.
157. Understand the physical and chemical principles that govern the movements of molecules in solutions and how these principles apply to membranes and to biological systems.
158. Explain the role of light in photosynthesis and the processes that are involved in the synthesis of ATP and NADPH.
159. Describe the cyclic reactions that accomplish the fixation and reduction of CO2 to produce organic molecules.
160. Understand the process of translocation of photosynthates in the phloem.
161. Understand the role of plant secondary metabolites in plant defense mechanisms.
162. Cultivate basic understanding of plant growth and development.
163. Infuse the concept of sustainable development and climate change in the course.

Course Resources

Required Course Text

Taiz,L, Zeiger, E. Molles, (2006) *Plant Physiology*. Fourth edition, Sinauer Associates, Inc., Publishers, Sunderland, MA
There is a website associated with this text. See: www.plantphys.net
Hands-out prepared by the instructor, readings and assignments will be posted on blackboard.

References

Hopkins, G. and Huner, N. 2004. Introduction to Plant Physiology. 3rd ed. John Wiley & Sons.
Buchanan, B; Gruissem, W. and Jones, R. 2000. Biochemistry and Molecular Biology of Plants. American Society of Plant Physiologists.
Walter, L. 2003. Physiological Plant Ecology: Ecophysiology and Stress Physiology of functional groups. 4th ed. Springer.

Resources Available to Students

Library Resources: NDU Library is open to students to help you in all your research and class work. Qualified personnel are available to help you.

Writing Center: The Writing Center provides assistance to all students who wish to discuss their writing with a trained consultant. The Center is located in HA 114. An appointment is required.

Blackboard (bb) Software: Lecture material, handouts, readings and assignments will be posted on blackboard. If you are not familiar with the Blackboard system, it is recommended to attend a training session at the University Computer Services in order to know how to use the Blackboard system to enrich the academic communication with your instructor and your colleagues.

Grading and Evaluation

Exam I	20%
Exam II	20%
Final exam (comprehensive)	35%
Lab work and assignments	25%
Total	**100%**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

Classes are a mix of lectures (powerpoint presentations) and discussions. The lecture topic is announced ahead of time for you in order to read assigned material before coming to class. Each lecture begins with a clear and detailed set of learning objectives. After discussing a major concept, multiple choice, and short answer questions are administered in the class to test your understanding and to pinpoint deficient areas of

comprehension. This interactive approach requires your active participation. Laboratory experiments are designed to parallel, augment and clarify lecture material. Assigned reading from current literature will keep you abreast with recent developments in the field. I will use blackboard to post announcements and lecture material.

Course Schedule

# Weeks	**Topic** (additional readings are available in the course modules)	Reading
1	Discussion of the syllabus.	
	Transport and Translocation of Water	
1-2	Water and plant cells.	Ch 3
3	Water balance of plants.	Ch 4
	Transport and Translocation of Solutes	
4	Mineral nutrition.	Ch 5
5	Solute transport.	Ch 6
	Biochemistry and Metabolism	

6-7	Photosynthesis: the light reactions.	Ch 7
8-9	Photosynthesis: carbon reactions.	Ch 8
10	Translocation in the phloem.	Ch 10
11	Secondary metabolites and plant defence.	Ch 13
	Growth and Development	
12	Growth and Development (Several sources)	
	Growth and Development	
13-14	Focus on climate change and sustainable development	

Course	Plant Physiology
Module 1	Transport and Translocation of Water
Key Concepts	Polarity of water molecule, Hydrogen bond, Latent heat of vaporization, cohesive and adhesive properties of water, surface tension of water, capillarity of water, Tensile strength of water, hydrostatic pressure, Diffusion of water, Fick's first law, Pressure driven bulk flow, Osmosis, Chemical potential of water, osmotic potential, Hoffler diagram, Hydraulic conductivity, aquaporins, water potential and plant growth, water in the soil, field capacity, Permanent wilting point, water movement in symplast and apoplast, root pressure, cohesion-tension theory of sap ascent, xylem cavitation, water loss in plants.
Overview	In the first unit of this module we will study the function of water in plant life and how water moves into and out of plant. In order to understand this we need to study the properties of water and the physical forces that influence water movement. In the second unit we will study the water balance in plants by discussing water status in the soil, water absorption by the roots, water transport through the xylem and water movement from the leaf to the atmosphere. Emphasis in this module will be placed on the sustainable use of water in our society.
Aim	The aim of this module is to emphasize the importance of water in the life of plants and all living organisms and to explore the adaptation of plants to hot, arid conditions.
Learning Outcomes	At the end of this module learners will be able to: • Study the structure and properties of water. • Understand water transport processes. • Learn about water movement in the soil. • Trace the movement of water from the soil to the roots. • Examine how the structure of the xylem contributes to the movement of water from the roots to the leaves. • Examine how plants minimize the consequences of cavitation. • Explore the driving force for leaf transpiration and the anatomical features of the leaf that regulates transpiration.

	• Emphasize the importance of selection of plants in sustainable use of water in agriculture.
Units	Unit 1.1: Water and plant cells. Unit 1.2: Water balance of plants.
Readings	Measuring water potential. http://5e.plantphys.net/article.php?ch=3&id=29 Calculating capillary rise http://5e.plantphys.net/article.php?ch=3&id=25 Green, P. B., and Stanton, F. W. (1967) Turgor pressure: Direct manometric measurement in single cells of *Nitella. Science* 155: 1675–1676. Heydt, H., and Steudle, E. (1991) Measurement of negative pressure in the xylem of excised roots. Effects on water and solute relations. *Planta* 184: 389–396. Leaf transpiration and water vapor gradient. http://5e.plantphys.net/article.php?ch=4&id=42 Malone, M., and Tomos, A. D. (1992) Measurement of gradients of water potential in elongating pea stem by pressure probe and picolitre osmometry. *J. Exp. Bot.* 43: 1325–1331. Irrigation http://5e.plantphys.net/article.php?ch=4&id=38 Steudle, E. (2001) The cohesion-tension mechanism and the acquisition of water by plant roots. *Annu. Rev. Plant Physiol. Plant Mol. Biol.* 52: 847-875. Zeiger, E. (1983) The biology of stomatal guard cells. *Annu. Rev. Plant*

	Physiol. 34: 441–475.
Activity	**Overview** *Assignments:* 1. What is the importance of the water potential concept in plant physiology? What are the components of water potential? 2. List three unique properties of water that make it such a good medium for cellular functioning, and explain how each property is useful to the plant. 4. How does water move across a largely hydrophobic plasma membrane? 5. Describe the path followed by water from the soil, through the plant and into the atmosphere. Where in the path are the important resistances to water movement? 6. Describe the casparian strip and its function. What is the most important substance in the casparian strip, from the point of view of its function? 7. What is the driving force for the movement of water from the soil to the top of a tree and into the atmosphere? 8- Explore the landscape on campus. Do you think that the selection of plants is appropriate for our environment in Lebanon, especially when it come to water use. Based on what you learned in this module what modifications you suggest for sustainable use of water on campus.
Module 2	Transport and Translocation of Solutes

Key Concepts	Mineral nutrition, Essential nutrients, deficiencies and plant disorders, nutrient solutions, soil and plant tissue analysis, treating nutritional deficiencies, mycorrhizal fungi facilitate nutrient uptake by roots, Passive and active transport, chemical potential, diffusion potential, Nernst equation, membrane transport processes, primary and secondary active transport, membrane transport proteins, ion transport in roots.
Overview	In this module we will discuss the essential nutrients of plants along with their deficiencies and associated plant disorders. This is followed by a discussion on treating nutritional deficiencies. In addition, the role of microbes in plant nutrition will be explored. In the second unit of this module we examine passive and active transport of solutes, transport of ions across membrane barriers, membrane transport processes and ion transport in roots.
Aim	The aim of this unit is to explore the overall topic of nutrition in plants along with transport of solutes. The effect of overuse of fertilizers on the ecosystem will be tackled along with solutions to this problem.
Learning Outcomes	At the end of this module learners will be able to: • Recognize essential nutrients, deficiencies, and plant disorders. • Learn how to treat nutritional deficiencies. • Discuss the importance of soil properties, root structure and mycorrhizal symbiotic relationships to plant mineral nutrition. • Recognize the difference between passive and active transport of solutes. • Study the factors that influence the passive distribution of ions across a membrane. • Understand membrane transport processes. • Recognize the impact of overuse of chemical fertilizers on the environment.
Units	Unit 2.1: Mineral nutrition

	Unit 2.2: Solute transport
Readings	Symptoms of deficiency inessential minerals. http://5e.plantphys.net/article.php?ch=5&id=289 Raghothama, K. G. (2000) Phosphorus acquisition; plant in the driver's seat! *Trends in Plant Science* 5: 412-413. Fox, T. C., and Guerinot, M. L. (1998) Molecular biology of cation transport plants. *Annu. Rev. Plant Physiol. Plant Mol. Biol*. 49: 669-696. Baker, A. J. M., and Brooks, R. R. (1989) Terrestrial higher plants which hyperaccumulate metallic elements—A review of their distribution, ecology and phytochemistry. *Biorecovery* 1: 81–126. ABC transporters in plants http://5e.plantphys.net/article.php?ch=6&id=54 Bush, D. S. (1995) Calcium regulation in plant cells and its role in signaling. *Annu. Rev. Plant Physiol. Plant Mol. Biol.* 46: 95-122. Hedrich, R., and Schroeder, J. I. (1989) The physiology of ion channels and electrogenic pumps in higher plants. *Annu. Rev. Plant Physiol*. 40: 539-56
Activity	**Overview**
	Assignments: some assignments are taken or modified from the textbook. 1. What does a plant need to grow from seed and complete its life cycle? What is the difference between the requirements of a plant and an animal?

	2. What is an essential element? How many have been identified? What is the difference between an essential element and a beneficial one? Provide an example of each. 3. What is a nutrient solution? Why is it more convenient to use liquid medium, as opposed to soil, to grow plants in nutritional studies? In nutrient solutions, nitrogen can be supplied as NH_4^+ or NO_3^-. Which one would use in a nutritional study? 4. What is the difference between a macronutrient and a micronutrient? Provide a reason for the inability of plant physiologists to identify micronutrients in early nutritional studies. Why is it difficult to supply iron in nutrient solutions? What is the best way to overcome this difficulty? 5. What is a mineral deficiency? How can a mineral deficiency be recognized? How can farmers benefit from nutrient analysis? 6. What is meant by the term "active transport"? What is the difference between "primary" and "secondary" active transport? 7. What is the meaning of the Nernst equation? If the current carried by K^+ ions diffusing through a K^+ channel is plotted against the membrane potential, at what potential will the direction of current reverse? 8. Both membrane channels and carriers show changes in protein conformation. What is the role of such conformation changes (a) in channels, and (b) in carriers? 9. How can the operation of the plasma membrane H^+-ATPase affect (a) the

	diffusion of K^+ through membrane channels, and (b) the accumulation of sugars from the apoplast into the cell? 10. Overuse of chemical fertilizers in Lebanon is contributing to water and soil pollution. Investigate the extent of this problem. 11. How can we sustainably maintain the fertility of the soil? Based on what you studied in this module, devise a plan to be used by a farmer to achieve this objective.
Module 3	Biochemistry and Metabolism
Key Concepts	Thylakoid reactions, Light as a particle and a wave, absorption spectrum, antenna complex, reaction center complex, quantum yield, Photosystem I and II, enhancement effect, red drop effect, antenna funnels energy to the reaction center, Light harvesting complex I and II, electron transport, ATP synthesis by chemiosmotic mechanism. The Calvin cycle, Light regulate the Calvin cycle, Rubisco activity and light, photorespiration, CO2 concentrating mechanisms: C4 carbon cycle and CAM. Pathways of translocation, P. Protein bodies, companion cells, source to sink pathway, pressure flow model, phloem loading and unloading, photosynthate distribution: allocation and partitioning.
Overview	In this module we will discuss the process of photosynthesis in plants, translocation of sugars in the phloem and secondary metabolites and plant defence. In photosynthesis we are going to explore the light reactions and carbon dioxide fixation reactions. Emphasis will be placed on food security and the role of agriculture in sustainable production of food. The translocation of sugars will be discussed with emphasis on accumulating sugars in storage organs to be used as a source of food. Finally we will explore the large number of secondary metabolites produced in plants,

	their role in plants for defence and the potential sustainable use of these compounds by society in medicine and industry.
Aim	The aim of this module is to appreciate the role of plants as producers of biomass and food. In exploring the biochemistry of the process of photosynthesis, we are interested in sustainably increasing food production to satisfy the need of increasing world population. In exploring the biosynthetic pathways of secondary metabolites, we will be able to tap this great resource to be used in medicine and industry.
Learning Outcomes	At the end of this module learners will be able to: • Study the organization of the photosynthetic apparatus • Comprehend the organization of light-absorbing antenna systems • Examine the organization of the photosynthetic apparatus • Understand the mechanisms of electron transport • Study proton transport and ATP Synthesis in the chloroplast • Explore the Calvin cycle • Understand the regulation of the Calvin cycle • Understand the process of photorespiration • Examine the synthesis of starch and sucrose. • Apply what we studied in photosynthesis to sustainably increase food production. • Examine the pathway and patterns of translocation of photosynthates in the phoem. • Discuss Phloem loading and unloading. • Understand the allocation and partitioning of photosynthates. • Explore ways to increase storage of starch in edible portion of the plant. • Discuss the mechanism of by which plants protect themselves against pests. • Emphasize the use of disease and insect resistant plants to reduce

	the unsustainable use of pesticides.
Units	Unit 3.1: Photosynthesis: the light reactions. *Unit 3.2:* Photosynthesis: carbon reactions. Unit 3.3: Translocation in the phloem. Unit 3.4: Secondary metabolites and plant defence.
Readings	The distribution of chlorophylls and other photosynthetic pigments. http://5e.plantphys.net/article.php?ch=7&id=67 Chlorophyll biosynthesis. http://5e.plantphys.net/article.php?ch=7&id=76 Yachandra, V. K., Derose, V. J., Latimer, M. J., Mukerji, I., Sauer, K., and Klein, M. P. (1993) Where plants make oxygen: A structural model for the photosynthetic oxygen-evolving manganese cluster. *Science* 260: 675–679. Abrahams, J. P., Leslie, A. G. W., Lutter, R., and Walker, J. E. (1994) Structure at 2.8 Å resolution of F_1 -ATPase from bovine heart mitochondria. *Nature* 370: 621–628. Mayfield, S. P., Yohn, C. B., Cohen, A., and Danon, A. (1995) Regulation of chloroplast gene expression. *Annu. Rev. Plant Physiol. Plant Mol. Biol.* 46: 147–166. How the Calvin Benson cycle was elucidated. http://5e.plantphys.net/article.php?ch=8&id=77 Single-cell C4 photosynthesis.

	http://5e.plantphys.net/article.php?ch=8&id=421 Badger, M. R., and Price, G. D. (2003) CO_2 concentrating mechanisms in cyanobacteria: Molecular components, their diversity and evolution. *J. Exp. Bot.* 54: 609–622. Dai, S., Schwendtmayer, C., Schürmann, P., Ramaswamy, S., and Eklund, H. (2000) Redox signaling in chloroplasts: Cleavage of disulfides by an iron-sulfur cluster. *Science* Jan 28, 287: 655–658. Partitioning: the role of sucrose-metabolizing enzymes in sinks http://5e.plantphys.net/article.php?ch=10&id=431 Aki, T., Shigyo, M., Nakano, R., Yoneyama, T., and Yanagisawa, S. (2008) Nano scale proteomics revealed the presence of regulatory proteins including three FT-like proteins in phloem and xylem saps from rice. *Plant Cell Physiol.* 49: 767-790. Aoki, K., Suzui, N., Fujimaki, S., Dohmae, N., Yonekura-Sakakibara, K., Fujiwara, T., Hayashi, H. Yamaya, T., and Sakakibara, H. (2005) Destination-selective long-distance movement of phloem proteins. *Plant Cell* 17: 1801–1814. Furch, A. C. U., Hafke, J. B., Schulz, A., and van Bel, A. J. E. (2007) Ca^{2+}-mediated remote control of reversible sieve tube occlusion in *Vicia faba*. *J. Exp. Bot.* 58: 2827-2838. The Shikimic Acid Pathway. http://5e.plantphys.net/article.php?ch=13&id=23

	Unraveling the function of secondary metabolites. http://5e.plantphys.net/article.php?ch=13&id=313
Activity	**Overview**
	Assignments: some assignments are taken or modified from the textbook. 1. What is an action spectrum? What is the relationship between the action spectrum for photosynthesis and the absorption spectrum of chlorophyll? 2. Photosynthesis in oxygen-evolving organisms is said to involve two distinct photosystems. Describe the two photosystems and provide two lines of experimental evidence that led to their discovery. 3. What is the role of electron transport in oxygen-evolving photosynthesis? Name the final electron donor and final electron acceptor in photosynthesis. Describe the path travelled by an electron in the electron transport process. 4. Describe the process of ATP synthesis at the thylakoid membrane. Name the reactants, the energy source and the role of light in the process. Can ATP synthesis take place in thylakoid membranes kept in the dark? Explain your answer. 5. The term "dark reactions" was used for many years to describe the reactions for incorporating CO_2in photosynthesis. Why was this term considered appropriate at the time and why is it considered inappropriate

	now? 6. Photorespiration is generally considered to be a wasteful process that decreases the yield of C_3plants. What experiment would you propose to minimize the role of photorespiration in plants? 7. What would be the consequence in each of the following if the thioredoxins in chloroplasts were reduced not by ferredoxin but by NADPH as is the case for their cytosol counterparts? Assume NADPH is constant. Explain your answer. A. Rate of starch synthesis. B. Hexose monophosphate pool in chloroplasts in the dark. C. Synthesis of malate in C_4 plants. D. Synthesis of malate in CAM plants assuming an adequate supply of phosphoenolpyruvate. E. Activity of Rubisco. 8. A sucrose molecule has been synthesized in the chloroplast stroma of a mesophyll cell. Describe the path that the sucrose molecule would follow if it is to become part of the sucrose pool in a developing seed. 9. What is a typical velocity of sap moving in the phloem? Can phloem sap move at that velocity by diffusion? 10. Describe the pressure-flow model of translocation in the phloem. Does water move down its water potential gradient in this model? 11. Explain the concepts of source and sink in phloem transport. Leaves

	are said to be sinks early in development and to become sources as they attain photosynthetic competence. What experiments would you design to study the leaf transition from sink to source? 12. How do secondary metabolites differ from primary metabolites? 13. Discuss the main functions of secondary metabolites in plants and relate these functions to their sites of accumulation in the plant. 14. What are terpenes, chemically, and how are they synthesized? Give one example each of how mono- and triterpenes serve as feeding deterrents to insects. 15. Apply what you learned in this module to prepare a report on the best practices to produce food sustainably.
Module 4	Growth and Development
Key Concepts	Sporophytic development, embryogenesis, vegetative development, the origins of polarity in embryogenesis, axial polarity of plant, intercellular communication, shoot apical meristem development, root apical meristem development, vegetative organogenesis, types of senesce, programmed cell death.
Overview	This module is concerned with the morphological and anatomical changes during development along with the biochemical and molecular mechanisms underlying these changes. This includes both the vegetative as well as the reproductive phases of the life of plants.
Aim	The aim of this module is to understand the mechanisms that regulate the development of the plant from embryogenesis through vegetative and

	reproductive stages.
Learning Outcomes	At the end of this module learners will be able to: • Discuss the major stages of sporophytic development. • Study the origins of polarity in embryogenesis. • Understand the function of shoot apical meristem. • Understand the function of root apical meristem. • Discuss the process of vegetative organogenesis • Understand the process of senescence and programmed cell death of plants
Units	Unit 3.1: Growth and development
Readings	Division Plane Determination in Plant Cells - Laurie G. Smith, Division of Biological Sciences, University of California, San Diego (May 2006). http://5e.plantphys.net/article.php?ch=16&id=225 Plant Meristems: A Historical Overview - Ian Sussex, Department of Molecular, Cellular, and Developmental Biology, Yale University (May 2006). http://5e.plantphys.net/article.php?ch=16&id=169 Watanabe, A., Hamada, K., Yokoi, H., and Watanabe, A. (1994) Biophysical and differential expression of cytosolic glutamine synthetase genes of radish during seed germination and senescence of cotyledons. *Plant Mol. Biol*. 26: 1807–1817. Ryu, S. B., and Wang, X. (1995) Expression of phospholipase D during castor bean leaf senescence. *Plant Physiol*. 108: 713–719.

	McLean, B. G., Hempel, F. D., and Zambryski, P. C. (1997) Plant intercellular communication via plasmodesmata. *Plant Cell* 9: 1043–1054. Bleecker, A. B., and Patterson, S. E. (1997) Last exit: Senescence, abscission, and meristem arrest in *Arabidopsis*. *Plant Cell* 9: 1169–1179. Barlow, P. W. (1994) Evolution of structural initial cells in apical meristems of plants. *J. Theor. Biol.* 169: 163–177.
Activity	**Overview**
	Assignments: (some assignments are taken or modified from the textbook) 1- What are the three main stages of sporophytic (that is, diploid generation) development in plants? 2- What are the five stages of embryogenesis in Arabidopsis*?* 3- What essential features of the mature plant are established during embryogenesis, and at what stage in embryogenesis is each feature determined? 4- Using a labelle diagram, show how the apical–basal organization of tissues in Arabidopsis seedlings is derived from earlier embryonic stages. 5- Compare and contrast "position-dependent" cell division patterns during plant embryogenesis with "lineage-dependent" cell division

	patterns during animal embryogenesis. 6- What is the evidence that the hormone auxin may serve as a signaling agent during plant embryogenesis? 7- What mutation in Arabidopsis causes the formation of vascular tissue consisting of xylem, but no phloem. 8- Discuss how the intercellular movement of a transcription factor is involved in the differentiation of cortical and endodermal cells in Arabidopsis. 9- What is the primary function of the *CLAVATA* genes, and what type of proteins do they encode? Diagram a model for CLV1 and CLV3 action and regulation at the molecular level. What is the nature of the extracellular signal regulating CLV1?
Module 5	Focus on Climate Change and Sustainability
Key Concepts	.
Overview	One of the major challenges facing our society is forecasting the response of plants and their ecosystems to climate change. The rapid environmental changes caused by humans may cause the extinction of many plant species due to the lack of sufficient genetic diversity to adapt successfully to the rapid environmental changes. In this module we are going to review articles published in a special issue of Plant Physiology [(December 2012, 160 (4)] about pants and climate change. The article provide an overview on the current advances in relation to the response of plants to rapid climate change.
Aim	The aim of this unit is to explore our current understanding of the abrupt changes in climate on the health of plants and their ecosystems along with their

	impact on society.
Learning Outcomes	At the end of this module learners will be able to: • Recognize the impact of climate change on plant-insect interactions. • Evaluate the influence of climate change on global crop productivity and its effect on society. • Recognize the physiological traits for improving heat tolerance in wheat. • Understand the consequences of climate Warming and altered precipitation patterns for plant-insect and multitrophic Interactions. • Know the evolutionary and ecological responses to anthropogenic climate Change: • Discuss therole of plants in the effects of global change on nutrient Availability.
Units	Unit 2.1: \plant insect interactions and climate change. Unit 2.2: Crop productivity and climate change. Unit 2.3: Heat tolerance in wheat. Unit 2.4: Evolutionary and ecological responses to climate change. Unit 2.5: Role of plants in the effects of climate change on nutrient availability.
Readings	Climate Change: Resetting Plant-Insect Interactions *Plant Physiol. 2012 160: 1677-1685. First Published on September 12, 2012; doi:10.1104/pp.112.204750* The Influence of Climate Change on Global Crop Productivity *Plant Physiol. 2012 160: 1686-1697. First Published on October 10, 2012;*

	doi:10.1104/pp.112.208298 Physiological Traits for Improving Heat Tolerance in Wheat *Plant Physiol. 2012 160: 1710-1718. First Published on October 9, 2012; doi:10.1104/pp.112.207753* Consequences of Climate Warming and Altered Precipitation Patterns for Plant-Insect and Multitrophic Interactions *Plant Physiol. 2012 160: 1719-1727. First Published on October 5, 2012; doi:10.1104/pp.112.206524* Evolutionary and Ecological Responses to Anthropogenic Climate Change: Update on Anthropogenic Climate Change *Plant Physiol. 2012 160: 1728-1740. First Published on October 5, 2012; doi:10.1104/pp.112.206219* The Role of Plants in the Effects of Global Change on Nutrient Availability and Stoichiometry in the Plant-Soil System *Plant Physiol. 2012 160: 1741-1761. First Published on October 31, 2012; doi:10.1104/pp.112.20878.*
Activity	**Overview**
	1. A group of 2-3 students choose a review article from list of articles above and present it in the class as a PowerPoint presentation.

Course Syllabus

ENS 205:

Environment, Society and Ethics

Notre Dame University-Louaize, Faculty of Natural and Applied Sciences, Department of Sciences

Spring Semester, 2013-2014

Instructor Information

Instructor:	Dr. Tanos G. Hage
Office Location:	S242, Main Campus
Telephone:	Office – 09-208725
Office Hours:	MWF 1:00-2:00
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Course Identification

Course Number:	ENS 205
Course Name:	Environment, Society and Ethics
Course Location:	Main Campus
Class Times:	MWF 3:00-4:00
Prerequisites:	None
Faculty Web Page:	http://www.ndu.edu.lb/academics/fnas/deanmess.htm

Course Description/Overview

Introduction to the environmental goods and services, impacts of population growth and economic development on the environment, the evolution of societies, community organizations and the quality of life are presented. Special focus is given to the value types and existing moral relationships between human beings and their environment, environmental ethics views, their evolution and effects on the environment and wildlife protection. Sustainability principles and the impacts of international policies, environmental management worldviews and legally binding agreements on natural resources, societies and the world's economic balance are emphasized.

Course Learning Objectives

The overarching goals of this course are: a) to provide a clear, systematic, and comprehensive introduction to the philosophical issues underlying environmental and ecological awareness. b) introduce the relevance of philosophy for environmental concerns and some traditional ethical theories and principles. c) examine attempts to extend moral standing to animals, future generations, trees, and other natural objects. d) explore comprehensive environmental and ecological philosophies such as biocentrism, ecocentrism, deep ecology and ecofeminism. e) discuss climate change ethics and sustainability.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

164. Explore the impacts of humans on the environment.
165. Understand the current concepts and controversies in relation to environmental ethics.
166. Examine the concept of human rights in the context of population pressures and the hunger of poor people around the world.
167. Distinguish between anthropocentric and non anthropocentric environmentalism.
168. Implement sustainability principles as a framework to improve the quality of life
169. Assess practical matters by addressing issues of personal character and lifestyle as well as public policy.
170. Address the issue of ethics of climate change and sustainability.

Course Resources

Required Text Book

Joseph R. DesJardins (2006) Environmental Ethics: An introduction to Environmental Philosophy. Fourth edition. Wadsworth, Cengage Learning. USA.

Additional References

Dale Jamieson (2008) Ethics *and the Environment*. Cambridge University Press, Cambridge, UK.

Peter S. Wenz (2001) *Environmental Ethics today*. Oxford University Press, Oxford, UK

Louis P. Pojman and Paul Pojman (2012) *Environmental Ethics: Readings in Theory and Applications*, Sixth edition. Wadsworth, Cengage Learning. USA.

Andrew Light and Holmes Rolston III (2003) *Environmental Ethics: An Anthology*. Blackwell Publishing, USA.

David R. Keller (2010) *Environmental Ethics: The Big Questions*. Wiley-Blackwell, U.K.

The ethics of sustainability: Charles J. Kibert Leslie Thiele Anna Peterson Martha Monroe
http://www.cce.ufl.edu/wp-content/uploads/2012/08/Ethics%20of%20Sustainability%20Textbook.pdf

Assignments and Grading Scheme

The University uses the following system of grades. This system consists of letter grades with their corresponding numerical ranges (*i.e.* percentage equivalent, and the 4.0 point maximum).

Grade	Description	Quality Point Value	Percentage Equivalent
A^{+}	Outstanding	4.0	97-100
A	Excellent	4.0	93 - 96
A^{-}	Very Good	3.7	89 - 92
B^{+}	Good	3.3	85 - 88
B	Good	3.0	80 - 84
B^{-}	Good	2.7	77 - 79
C^{+}	Satisfactory	2.3	73 - 76
C	Satisfactory	2.0	70 - 72
C^{-}	Passing	1.7	66 - 69
D^{+}	Passing	1.3	63 - 65
D	Lowest Passing	1.0	60 - 62
F	Failure	0.0	0 - 59
UW	Unofficial Withdrawal	0.0	

The grade "*UW*" is assigned by the instructor when a registered student has never attended a class or has ceased attending and has not submitted an official course withdrawal request to the Office of the Registrar. This grade is computed as an *F* grade in the grade-point average.

Grading Policy

Grades can be based on the following: (Example)

First exam	20%
Second exam	20%
Final Exam	35%
Project and Assignments	20%
Participation and Evaluation	05%
Total Points	**100**

Course Policies

Late Assignments

It is essential that papers and other assignments be completed and submitted on time. Once the due date is past, without notice and justification, the submission is not accepted.

Classroom Protocol

Classes are a mix of lectures (Powerpoint presentations) and class discussions. The material related to course is presented in a clear manner that engages the students by relating abstract concepts to current everyday issues or controversies that they care about. Material and assignments will be posted on blackboard. Additional readings will be assigned from the literature on specific subjects. Field trip(s) will be planned to visit a natural wild area in Lebanon. You should record all your observations, thoughts and questions in your field journal. Your field observations will be unique to you, reflecting your personal style. For each field trip a report is expected. Includes photos and sketches with your write up.

Course Schedule

Week	Date	Topics
1-2		Science, ethic and the environment
3-4		Responsibilities to future generations: sustainable development
5-6		Responsibilities to the natural world: from anthropocentric nonanthropocentric ethics.
7-8		Biocentric ethics and the inherent value of life
9-10		The land ethics, deep ecology and ecofeminism
11-12		Environmental justice and social ecology
13-14		Climate Change and energy policy
15		Class presentations and discussions

Course Policies

No make-up exam is allowed under normal circumstances. Consequently, a student missing an exam with no justifiable reason will lose the grade value of that exam.

Under abnormal circumstances a student is allowed a make-up exam under the following conditions:

1. The student shows that missing the exam was beyond his/her control.
2. The instructor and chairperson accept the case presented and approve of the make up.
3. The student may lose 10 points out of 100 of the grade value of the exam in question.

4. The make up exam shall be done within 10 days after the elapse of the exam date.

Assignments should be returned by the due date. Failure to do so will result in losing up to 20% of the grade.

Mobile phones should be turned off and out of sight (i.e. not face-up on the desk but preferably inside purses, backpacks, briefcases, etc. or face down on the desk). Phones may not be answered.

Students must attend class with the required material (i.e. original textbook, notebook, pens, etc.).

Once in class, students are expected to remain in class for the entire period.

English must be the only language spoken in class at all times.

Special needs: Any student who feels s/he may need an accommodation due to a disability should contact the instructor privately to discuss those specific needs.

Policies & Procedures

NDU's Attendance Policy
Student should attend all classes and laboratory sessions on time. A pattern of absences, whether authorized or not, and even below the maximum number (specified below), may alter one's grade substantially. The SAO alone authorizes absences. No absence absolves a student from the responsibility of acting upon the material presented during his/her absence. The maximum number absences for classes that meet on MWF is six; the maximum number for classes that meet on TTh and in the summer is four, (or two hours per credit course). Any student whose absences exceed the maximum limits shall automatically fail the course unless the student withdraws.

Office Hours: All instructors at NDU are available for office hours during the week. Please note the office hour that your instructor has dedicated to this course to make an appointment. Just dropping by may not ensure that the professor has set aside time to assist you. Office hours may be used ideally to ask for guidance on an assignment or to ask questions concerning a subject that you were not clear on during class time.

NDU's Academic Integrity Policy

Students are expected and encouraged to be honest and to maintain the highest standards of academic integrity in their academic work and assignments at the University. They shall refrain from any academic dishonesty or misconduct including; but not limited to:

- Plagiarism; that is, the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Also, paraphrasing, summarizing, as well as well as direct quotations are considered as plagiarism, if the original source is not properly cited.
- Cheating.
- Assisting in cheating.
- Substituting a student in the taking of an examination.
- Substituting examination booklets.
- Submitting the same work for more than one course and the like. o Submitting papers written by others.
- Receiving or providing unauthorized help or assistance in any academic work or assignment. Intentional violation of program and degree requirements and regulation as established by the University.
- Dishonest reporting of computational, statistical, experimental, research, results, or the like.

Course	Environment, Society and Ethics
Module 1	Science, ethics and the environment
Key Concepts	Environmental philosophy and ethics, Interplay between science and philosophy, decision making
Overview	Humans face unprecedented environmental challenges. Faced with such a catastrophic future we are challenged with critical decisions. Relying on science and technology without any consideration to ethical and philosophical issues may lead to more problems. Environmental policy needs to be decided upon in the political arena and not by scientists because the decisions that might be taken by experts in science and technology may not be objective.
Aim	The overriding aim of this module is to understand the critical role that environmental philosophy and ethics play in order to take the proper decisions related to environmental problems.
Learning Outcomes	At the end of this module learners will be able to: • Define environmental philosophy and environmental ethics. • Understand the role of environmental ethics in decisions related to environmental problems. • Discuss the interplay between scientists and environmental ethicists to reach the proper decisions related to environmental problems.
Units	Unit 1.1 Introduction: Why philosophy Unit 1.2: Science and ethics Unit 1.3: What is environmental ethics? Unit 1.4: Summary and conclusions
Readings	Louis P. Pojman and Paul Pojman (2012) *Environmental Ethics: Readings in Theory and Applications*, Sixth edition. Wadsworth, Cengage Learning. USA. The Master Bibliography in Environmental ethics has been composed by

	Holmes Rolston at Colorado State University and can beaccessed from the ISSE's website at http://www.cep.unt.edu/ISEE.html . This site has many links to other environmental resources.
Activity	**Overview** Assignment 1. When evaluating the safety of chemical pesticides, who should determine levels of acceptable risks? Is "risk" a matter of scientific fact, or is it a matter of value? What makes an issue a value issue? 2. Identify as many different uses of the words natural and nature as you can. Which, if any, have value connotations? Are all things that are "natural" also good? What about "human nature"? What is not natural about human beings? What would be the difference between "natural" fertilizers and "nonnatural" ones? Could there be such a thing as a "natural: pesticide? 3. Is there a difference between good science and bad science? We often hear that science should be value neutral. Is this true? Can you think of any values involved in the practice of good science? 4. How is reasoning about ethical matters different from reasoning about scientific matters? How do scientists evaluate controversial claims in science? How would we evaluate controversial ethical claims? 5. What makes a belief or statement objective? Contrast this with subjective beliefs or statements. What statements about a tree, for example, are objective? What statements about a tree are subjective?
Module 2	Responsibilities to future generations: sustainable development

Key Concepts	Sustainable development, overpopulation, consumption, environmental ethics and sustainability.
Overview	This module looks at how overpopulations and overconsumption issues raise questions related to future generations. If these trends remained unchanged the earth may face environmental and economic collapse in the next century, thus threatening the existence of future generations. The increased production of greenhouse gases and the destruction of carbon-absorbing vegetation threaten the entire planet with shifting climates and global warming. Applying traditional, standard ethical theories are unsatisfactory to tackle the above issues. Philosophical ethics are extended to answer questions related to our responsibilities toward future generations.
Aim	The overriding aim of this module is to understand the debate related to our responsibilities for future generations based on newly developed theories of environmental philosophy.
Learning Outcomes	At the end of this module learners will be able to: • Understand the impact of our actions on the quality of the environment for future generations. • Demonstrate a clear understanding of the concept of sustainable development. • Evaluate the different ideas related to our responsibilities toward maintaining a healthy environment for future generations.
Units	Unit 2.1: Introduction Unit 2.2: Population, consumption, and environmental ethics Unit 2.3: Do we have responsibilities to future generations? Unit 2.4: Climate change and sustainability Unit 2.5: Consumptions and sustainable development Unit 2.6: Summary and conclusions

Readings	Anne and Paul Ehrlich (1987) *Earth*. Franklin Watts, New York Paul Ehrlich and John Holdren (1988) *The Cassandra Conference: Resources for the Human Predicament*. Texas A&M University Press, Texas Station. Herman Daly (1987) *Sustainable Growth: An Impossible Theorem.* Massachusetts Institute of Technology Press, Boston.
Activity	**Overview**
	Assignment 1- Controversies such as those surrounding global warming and climate change involve long term predictions and therefore cannot be resolved in the short term. In light of this uncertainty, is there one reasonable course of action? What does reason advise when we must make a decision with incomplete information? 2- Do you believe that overconsumption or overpopulation plays a greater role in environmental destruction? Which problem would you address first? 3- Does more material lead to greater happiness? 4- Many indigenous cultures were destroyed when Europeans colonized the Americas and Africa. We can only guess at what we have lost as a result of these conquests. Have we been hurt by this loss? Can people be harmed by the loss of opportunities and the loss of knowledge of which they will never be aware? Will future generations be harmed if they never know about the blue whale or never know of a wilderness area?

	5- Global warming and Climate Change results primarily from using fossil fuels for energy. Americans use much more fossil fuel energy per capita than most other people. In fact According to environmental journalist Bill McKibben, "an American uses seventy times as much energy as a Bangladeshi, fifty times as much as a Malagasi, twenty times as much as Costa Rican." One result is this: "During the next decade India and China will each add to the planet about ten times as many people as the United States will-but the stress on the natural world caused by new Americans may exceed that from new Indians and Chinese combined." In light of these facts, and the importance of mitigating global warming, maybe we should combat population growth in the United States. Currently, American can claim children as a tax deduction on income taxes. Perhaps this should apply only to the first two children. What do you think?
Module 3	Responsibilities to the natural world: from anthropocentric to nonanthropocentric ethics.
Key Concepts	Moral standing, anthropocentrism versus non anthropocentrism, Animal liberation and animal rights, moral standing to nature.
Overview	This module answers two fundamental questions related to environmental ethics. First, what is the proper ethical relationship between humans and the natural environment? Second, what is the philosophical basis for this relationship? Standard ethical theories are not enough to answer the above questions. According to the traditional theories we protect the environment for our interests (human-centered views or anthropocentric views). In this module we examine the shift in the philosophical perspective. Philosophers started to argue that we have direct ethical responsibilities to nature, responsibilities that do not depend on the consequences to humans. This shift can be characterized as the shift between anthropocentric to nonanthropocentric theories of ethics.

Aim	This module aims at examining shift between anthropocentric to nonanthropocentric theories of environmental ethics.
Learning Outcomes	At the end of this module students will be able to: • Understand the concept of moral standing • Evaluate the shift between anthropocentric to nonanthropecentric views about nature and the environment. • Review the animal liberation movement as discussed by Peter Singer • Explain Tom Regan's argument concerning animal rights • Discuss the systematic ethical considerations to nonhuman natural objects.
Units	Unit 3.1: Introduction *Unit 3.2: Moral standing in the western tradition* Unit 3.3: Early environmental ethics Unit 3.4: Moral standing Unit 3.5: Do trees have standing? Unit 3.6: Peter Singer and the animal liberation movement Unit 3.7: Tom Regan and animal rights Unit 3.8: Ethical implications of animal welfare Unit 3.9: Critical challenges:
Readings	Peter Singer (1990) *Animal Liberation*. Second edition. Review of Books Press, New York. Tom Regan (1985) *The Case for Animal Rights* in *In Defence of Animals*. Basil Blackwell, Oxford. Roderick Nash (1989) *The rights of Nature*. University of Wisconsin Press, Madison.

	Eugene Haegrove (1989) *Foundations of nvironmental Ethics*. Prentice-Hall, New York.
Activity	**Overview**
	Assignment 1- Throughout the world, many laws prohibit abuse of animals. List as many reasons for these prohibitions as you can. Do any of these reasons commit you to holding that animals have a moral standing in their right:? 2- Try the following mental experiment concerning what objects have moral standing. Assume that competent adult human beings are placed at one end of a continuum and a rock at the other. Where along that continuum would you place the following: a child, a brain-dead adult, a fetus, a dolphin, a dog, an insect, an alien, a bird, a species, and a tree? Have you used a single criterion either implicitly or explicitly? 3- Do you see any morally relevant differences between domesticated and wild animals? Would Singer? Would Regan? Do you see any morally relevant differences between animals that are threatened with extinction and those that are not? 4- Does hunting or fishing raise any moral issues? If people eat the animals they kill, does that make a difference? In many areas, deer are overpopulating local habitats. Destruction of the habitat as well as mass starvation can occur in such circumstances. Would you favor selective hunting to thin overpopulated herds?

Module 4	Biocentric ethics and the inherent value of life
Key Concepts	Ethical extensionism, instrumental versus intrinsic value, Biocentrism.
Overview	The focus of this module is to consider systematic attempts in order to develop comprehensive environmental philosophies that are not in the realm of traditional standard Philosophy. Most of the recent philosophical work on the environment breaks with standard ethical theory and strive to rethink the relationships between humans and nature. Modern philosophers are are adopting the point of view of concerned citizens seeding to articulate, develop, and defend a coherent and comprehensive environmental philosophy.
Aim	The aim of this module is to explore the recent trends in environmental philosophy and ethics by emphasizing the concept of biocentrism or the reverence to life.
Learning Outcomes	At the end of this module learners will be able to: • Understand the concept of ethical extensionism • Define the terms instrumental and intrinsic vlaues • Evaluate the importance of biocentric ethics and its application in everyday life experiences.
Units	Unit 4.1: Introduction Unit 4.2: Instrumental value and intrinsic value Unit 4.3: Biocentric ethics and the reverence for life Unit 4.4: Ethics and character Unit 4.5: Taylor's biocentric ethics Unit 4.6: Practical implications Unit 4.7: Challenges and developments Unit 4.8: Summary and conclusions
Readings	James Brabazon (1975) *Albert Schweitzer: A Biography*. Putnam, New York.

	Holmes Rolston (1988) Environmental Ethics. Temple University Press, Philadelphia. R. Edward Grumbine (1994) Environmental *Policy and Biodiversity*. Island Press, Washington, D.C.
Activity	**Overview**
	Assignment 1- We use the word value both as a noun and as verb. Certain objects are said to possess value, and humans value numerous objects. If no humans were around to do the valuing, would anything of value remain? 2- Compose a list of things that you value. Distinguish those things that you value instrumentally from those things valued for their own sake. How many different types value can you think of? 3-Like Aristotle, Taylor suggests that each species has a distinctive nature that can best be identified in terms of a characteristic activity. How else might you distinguish between species? 4- In Taylor's account, does it make sense to attribute interests or goods to a wilderness area, to a river, or to other ecosystems? Can such things be teleological centers of life?
Module 5	The land ethics, deep ecology and ecofeminism
Key Concepts	Ecocentric ethics, ecosystems, holistic ethics, land ethics, deep ecology, ecofeminism
Overview	Some philosophers think that we should go beyond focusing mostly on

	individual species. They believe that we have an ethical responsibility to take a wider view and work to prevent degradation of the earth's ecosystems, biodiversity and the biosphere. This ecocentric view is devoted to helping sustain earth's biodiversity and the functioning of its life-support systems for all forms of life, now and the future. Their view is that the natural systems that we are all part of is holistic, that is, interconnected and interdependent. Ecocentric worldview holds that because humans and all forms of life are interconnected parts of the earth's life support system, it is in our own self-interest not to act in ways that impair the overall system. In this module we are going to explore three examples of ecocentric environmental philosophy: Land ethics, deep ecology and ecofeminism.
Aim	The overriding aim of this module is to discuss several examples of ecocentric environmental philosophies.
Learning Outcomes	At the end of this module learners will be able to: • Define holistic ethics and ecocentric ethics. • Discuss the influence of field of ecology in developing the ideas behind ecocentric ethics. • Describe the development of Leopold's land ethics principles. • Explore the criticisms associated with the Leopold's land ethics. • Explain the deep ecology platform as developed by Naess and Sessions. • Identify the two ultimate norms of deep ecology: self realization and biocentric equality. • Explore the criticisms associated with deep ecology • Elaborate on the variety of approaches that comprises ecofeminism
Units	Unit 5.1: The land ethics and Leopold's holism

	Unit 5.2: Criticism of the land ethics Unit 5.3: The ecology platform Unit 5.4: Self-realization and biocentric equality Unit 5.5: Criticisms of deep ecology Unit 5.6: Ecofeminism: making connections Unit 5.7: Ecofeminism: Recent developments
Readings	Aldo Leopold (1949) *A Sand County Almanac*. Ballantine, New York. J. Baird Callicott (1989) *In Defence of the Land Ethic*. State University of New York Press, Albany. John Davis (1991) *Earth first!* Pergrine Smith Books, Salt lake City. Dave Foreman (1991) *Confessions of an Eco-Warrior*. Harmony, New York. George Sessions (1995) *Deep Ecology for the Twenty-First Century*. Shambala Publishing, Boston. Janet Biehl (1991) *Rethinking Ecofeminist Politics*. South End Press, Boston. Greta Gaard (1993) *Ecofeminism: Women, Animals, Nature*. Temple university Press, Philadelphia.
Activity	**Overview**
	Assignment 1- Should farmers and ranchers be allowed to kill wild predetors such as coyote and wolves in order to protect their herds? How should government balance these competing interests?

	2- Do you support the view that humans are equal moral citizens of the biotic community? Is there a middle ground between humans as masters of nature and humans as equal biotic citizens? 3- Leopold suggests that the ”dead earth” is an organism that does possess a certain kind of life. What exactly is the difference between a living organism and a nonliving object? Is earth itself alive? 4- Can land or an ecosystem really be characterized as healthy or unhealthy in anything other than a metaphorical way? What exactly would a healthy ecosystem be? 5- Would civil disobedience in defence of the environment ever be justified? If so, when and why? Is tree spiking a defensible means for preventing logging of old-growth forests? 6- Is the statement “This is a tall tree” anymore objective that the statement “This is a majestic tree” ? Explain how both might be defended as true. 7- What “different questions” might someone taking a feminist approach to science and technology ask about such issues as nuclear energy, population policy, pesticides use, and animal agriculture?
Module 6	Environmental justice and social ecology
Key Concepts	Social justice theories, personal morality versus social justice, social ecology

Overview	Justice can be understood as the first principle of social and political philosophy: How should we live together? What is the proper structure of society? Living together in a community creates benefits and burdens that exist only within community, and we cannot account for community benefits and burdens solely in terms of individual rights and responsibilities. Social justice must address these questions: How should the benefits and burdens of society be distributed? How should social institutions treat people? What do people deserve from society? What type of individual is created by various social structures and institutions? This module examines the question of environmental justice in general and, more specifically, as it is understood within the philosophical perspective that has come be called social ecology. Two basic questions guide the discussion of environmental justice: Who bears the burdens of environmental harms? And who, if anyone, benefits from environmental harms? Justice demands a fair distribution of benefits and burdens.
Aim	The major focus of this module is the discussion related to environmental justice and social ecology.
Learning Outcomes	At the end of this module learners will be able to: • Distinguish between personal morality and social justice. • Review the theories of social justice • Discuss the link between environmental racism and environmental justice. • Understand the concept of social ecology
Units	Unit 6.1: Introduction Unit 6.2: Theories of social justice Unit 6.3: Property rights and justice Unit 6.4: Environmental justice and environmental racism Unit 6.5: Murray Bookchin's social ecology

	Unit 6.6: Critical reflections Unit 6.7: Summary and conclusions
Readings	1- Murray Bookchin, Dave Foreman in Steve Chase, ed. (1991) *Defending the earth*. South End Press, Boston. 2- Robert Bullard, ed. (1994) *Unequal Protection*. Sierra Club Books, San Francisco.
Activity	**Overview**
	Assignment 1- Must a public policy intentionally discriminate before it can be described as racist or sexist? Is discrimination always a matter of intent? In your opinion, what is the intent behind decisions on where to locate waste dumps? 2- Bookchin claims that human beings cannot help but be, or should they seek to being "purposive interveners" in nature. That would seem to conflict with the view of many preservationists and Deep Ecologists who believe that humans should let nature take its course. Discuss how these different theorists might evaluate policy on population control. 3- If the price of land in a rural area is less than that of comparable land in an urban area, is this land less valuable? If not, how do you determine the value of land? 4- Nomadic countries on many continents travel great distances following migrating herds of animals. Such people never settle permanently on one section of land. How might their understanding of ownership and property differ from yours? Can a concept of "private property" even exist in such a culture?

Module 7	Climate Change ethics and energy policy
Key Concepts	
Overview	This module presents a selection of 8 essays selected from the literature that deals with climate change ethics and energy policy: 1- Understanding the causes of global climate change (Pew Center on Global Climate Change). 2- Livestock's role in climate change and air pollution (UN report: Climate change and livestock). 3- Ethics and global climate change (Stephen M. Gardiner). 4- The denial industry (George Monbiot). 5- Hoodwinked in the Hothouse: False solutions to climate change. 6- Climate justice: The emerging movement against green capitalism (Ashley Dawson). 7- Sustainability and technology solutions in the climate policy debate: The case of geologic carbon sequestration (Evelyn Wright and Paul Pojman). 8- War and Climate Change (Barry Sanders). The first three essays offer an introduction to the science behind our understanding of climate change as well as the observed and predicted impacts. Together they make the argument that urgent action is needed.

	But although there is a consensus that action is needed, there is a vast difference of opinion as to what that action would be. The last four essays examine the growing resistance to proposed technological solutions, examining both the proposals and the global social concerns.
Aim	The overriding aim of this module is to critically evaluate eight essays that deals the science of climate change, proposed solutions and ethical concern.
Learning Outcomes	At the end of this module learners will be able to: • Understand the phenomenon of global warming and climate change. • Evaluate the proposed solutions to mitigate the effects of climate change. • Discuss the ethical concerns in relation to climate change
Units	Refer to the eight essays listed under the overview section.
Readings	The above eight essays are published in: Louis P. Pojman and Paul Pojman (2012) *Environmental Ethics: Readings in Theory and Applications,* Sixth edition. Wadsworth, Cengage Learning. USA.
Activity	**Overview**
	Read and evaluate the eight essays and provide a synthesis in a review article articulating the major ideas discussed. Review the status of climate change in Lebanon in regard to impacts, mitigation and adaptation practices. What is the ethical dimension of the climate change problem in Lebanon.

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

CEN 461: Water Pollution Control and Treatment

NDU-Louaize, Faculty of Engineering, DCEE

Fall 2014

Instructor Information

Instructor: Sophia Ghanimeh, Assistant Professor

Office Location: Faculty of Engineering, HA 367

Telephone: Office +961.9.208427

Office Hours: Tuesday 12:00 – 1:00 p.m.

E-mail: sghanimeh@ndu.edu.lb

Website: http://www.ndu.edu.lb/academics/faculty_research/fe/sophia~ghanimeh/profile.htm

Course Identification

Course Number: CEN 461

Course Name: Water Pollution Control and Treatment

Course Location: FA 1018

Class Times: TTh 1:30 – 3:00 p.m.

Prerequisites: CEN 462 – Environmental Engineering

Faculty Web Page: http://www.ndu.edu.lb/academics/fe/intro.htm

Course Description/Overview

Fundamental principles and engineering application of physical, chemical, and biological processes (like sedimentation, filtration, coagulation, flocculation, membranes, aerobic, anaerobic biological processes) are discussed.

Course Learning Objectives

The overreaching goals of this course are to provide:

h) Ability to design potable water treatment plants.

i) Ability to design treatment facilities for domestic wastewater.

j) Knowledge of resource conservation and sustainability aspects of water and wastewater management and biosolids processing and reuse.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Learn the basics of physical processes and apply them in the design of the treatment units addressed in this course.

2. Learn the basics of chemical processes and apply them in the design of the treatment units addressed in this course.

3. Learn the fundamentals and design concepts of aerobic and anaerobic biological treatment technologies.

4. Learn essential disinfection processes.

5. Be able to define an adequate process scheme for treating raw water and wastewater.

6. Perceive wastewater treatment as a resource conservation alternative by learning about the recycling and reuse of water and biosolids.

Course Resources

Course Website(s)

- WS1: http://www.epa.org
- WS2: http://www.eea.europa.eu/themes/water
- WS3: http://www.who.org

Required Course Texts and Materials

- Metcalf & Eddy, 2003, *Wastewater engineering: Treatment and reuse* (4th ed.). McGraw-Hill

Optional Course Texts and Materials

- Reynolds, T. D., and P. A. Richards, 1996. *Unit Operations and Processes in Environmental Engineering.* 2nd ed. Boston, MA: PWS Publishing Company. ISBN: 0534948847.

Assignments and Grading Scheme

Grading System

The University uses the following system of grades. This system consists of letter grades with their corresponding numerical ranges (i.e. percentage equivalent, and the 4.0 point maximum).

Grade	Description	Quality Point Value	Percentage Equivalent
A+	Outstanding	4.0	97-100
A	Excellent	4.0	93 - 96
A-	Very Good	3.7	89 - 92
B+	Good	3.3	85 - 88
B	Good	3.0	80 - 84
B-	Good	2.7	77 - 79
C+	Satisfactory	2.3	73 - 76
C	Satisfactory	2.0	70 - 72
C-	Passing	1.7	66 - 69

D+	**Passing**	**1.3**	**63 - 65**
D	**Lowest Passing**	**1.0**	**60 - 62**
F	**Failure**	**0.0**	**0 - 59**

Grading Policy

Grades are based on the following:

Exams (Midterm and Final)	65%
Projects/Assignment	30%
Class attendance/participation	5%
Total Points	**100**

Midterm and Final Exams (60%): Two exams cover class presentation and assignments. The final exam is comprehensive.

Course Projects (30%): Two projects (15% each) are designed to cover (1) water and (2) wastewater treatment design. In each project, every team (5 students) will propose a creative design to solve/manage a water/wastewater problem, then write a report and present it orally (10%) and critically review the proposal of another group (5%).

Class participation (5%): Students are expected to attend all sessions and participate actively in class discussion.

Course Policies

Late Assignments

While understanding that we all are busy with school, work, and family, your decision to register for this course is an indication that you have made it a high priority. Thus, extensions of assignment due dates are given only in extreme situations (death of a close family member, hospitalization, etc.) and require documentation on your part. Otherwise, due dates are fixed and non-negotiable. All assignments should be submitted on or before the assigned due date. Assignments past the due date will not be accepted for full credit. Examples of unreasonable extensions for an assignment include frequent computer malfunctions, outside class-work, or job responsibilities that inhibit meeting the required deadlines. If you anticipate missing a deadline on an assignment, you should send an e-mail to your instructor before the deadline. Unexcused assignments submitted after the due date may be returned ungraded or assigned a lower evaluation. Whether an extension is allowed will be at the instructor's discretion.

Classroom Protocol

Mobile phones should be turned off and out of sight (i.e. not face-up on the desk but preferably inside purses, backpacks, briefcases, etc. or face down on the desk). Phones may not be answered.
Students must attend class with the required material (i.e. original textbook, notebook, pens, etc.).
Once in class, students are expected to remain in class for the entire period.
English must be the only language spoken in class at all times.

Dissability

Any student who feels s/he may need an accommodation due to a disability should contact the instructor privately to discuss those specific needs.

Important Dates to Remember

Midterm Exam: Monday, December 01, 2014
Water Project Repot submittal: Thursday, October 30, 2014
Wastewater Project Repot submittal: Monday, January 05, 2015

Course Schedule

No. of weeks	*Topic covered*	*Reading assignment*
0.5	Introduction to water supply and wastewater treatment Course syllabus	Chapter 1 & notes or textbook of CEN 462
0.5	Wastewater characteristics and water standards	Chapter 2 & notes
0.5	Review of process analysis	Chapter 4 (4-1 to 4-3, 4-6 & 4-7)
Water Treatment		
1	Physical unit operations: Filtration using granular media and membrane technology	Chapter 11 (11-3, 11-4, 11-6, 11-7)
1.5	Chemical unit operations: Removal of turbidity, softening, adsorption and ion exchange	Chapter 11 & notes (11-7 to 11-9)
0.5	Disinfection	Chapter 12
1	Water week: Presentation of the student teams water projects Seminar delivered by a guest speaker Field trip to a water treatment plant	
Wastewater Treatment		
1	Physical unit operations: Screening, size reduction, flow equalization, sedimentation, flotation	Chapter 5 (5-1 to 5-3,5-5 to 5-7,5-10)
	Mid-Term Exam	
1	Introduction to biological treatment	Chapter 7
1.5	Aerobic biological processes (suspended growth): Activated sludge process, SBR and MBR	Chapter 8
0.5	Aerobic biological processes (attached growth): Trickling filters	Chapter 9 (9-1, 9-2)
1.5	Anaerobic biological processes: sludge management	Chapter 10

		(10-1 to 10-4) Chapter 14
1	Introduction to wastewater treatment software Class application	
1	Tertiary treatment: removal of phosphorus, heavy metals and nitrogen	Chapter 6 (6-1 to 6-5) Chapter 8 (8-5)
1	Wastewater week: Presentation of the student teams wastewater projects Seminar delivered by a guest speaker Field trip to a wastewater treatment plant	
1	Water and biosolids reuse	Chapter 13
	Final Exam	

Course	**Water Pollution Control and Treatment**
Module 1	Water Treatment
Key Concepts	Filtration, membranes, chemical treatment, disinfection
Overview	This module introduces the students to the concepts of depth filtration and the design of granular filters. It addresses also membrane filtration and the related commercial applications. Basic chemical treatment and disinfection methods are considered. The main question to be addressed in this module is: how to provide adequate treatment of groundwater, surface water or wastewater plant effluent to produce high-quality water?
Aim	The students should be able to describe the major components of a water treatment plant. They should understand the main concepts of water treatment: coagulation/flocuulation, hardness removal, ion exchange,

	filtration and disinfection. In addition, the students should be able to understand the operational requirements and challenges of state-of-the-art membrane technologies.
Learning Outcomes	At the end of this module learners will be able to: • Define the units needed for a water treatment plant • Identify the components of filtering units, including membrane elements, and calculate dosing requirements in chemical processing and disinfection units
Units	Unit 1.1 Granular and membrane filtration Unit 1.2: Chemical treatment Unit 1.3: Disinfection
Readings	Reynolds, T. D., and P. A. Richards, 1996. *Unit Operations and Processes in Environmental Engineering.* 2nd ed. Boston, MA: PWS Publishing Company. ISBN: 0534948847.
Activity	Water Week: This activity includes 3 components: 1. Field trip This trip includes a visit to a water treatment plant where the students get the chance to see commercial-scale applications and discuss operational aspects with the technical team 2. Meeting with a water professional A guest speaker, with a long experience in water treatment projects, will be invited to share a case study with the students. 3. Project #1 The student teams will submit and orally present their water treatment project proposals and critically review the proposal submitted by another team.

Course	Water Pollution Control and Treatment
Module 2	Wastewater Treatment and Sludge Management
Key Concepts	Physical treatment, aerobic and anaerobic biological treatment, tertiary treatment, Biosolids reuse
Overview	This module introduces the students to major wastewater treatment principles including: preliminary treatment, sedimentation and aerobic and anaerobic treatment, including membrane applications. Also, it covers the different aspects of sludge processing and reuse. The main question to be addressed in this module is: how to reuse the spent water and wastewater biosolids, as means to conserve Earth's resources and promote sustainable development?
Aim	The students should be able to address the different aspects of wastewater management, including generation and characteristics of wastewater, selection of treatment processes and design of individual treatment units. Similarly, the students should be able to quantify and characterize sludge generation, select the appropriate processing methods and design the corresponding treatment units. Most importantly, the students should be aware of the importance of water recycling as a main component of sustainable development and an efficient mean for adaptation to climate change.
Learning Outcomes	At the end of this module learners will be able to: • Identify and design the units needed for a wastewater treatment plant • Identify and design sludge treatment units • Place water and organics recycling in the bigger picture of sustainable development and climate change adaptation.
Units	Unit 1.1 Aerobic treatment processes Unit 1.2: Anaerobic treatment processes

	Unit 1.3: Tertiary treatment of wastewater Unit 1.4: Sludge processing
Readings	Reynolds, T. D., and P. A. Richards, 1996. *Unit Operations and Processes in Environmental Engineering.* 2nd ed. Boston, MA: PWS Publishing Company. ISBN: 0534948847.
Activity	Wastewater Week: This activity includes 3 components: 1. Field trip This trip includes a visit to a commercial-scale wastewater treatment plant and entails discussions with the plant personnel. 2. Meeting with a wastewater professional A guest speaker, with a long experience in wastewater treatment projects, will be invited to share a case study with the students. 3. Project #2 The student teams will submit and present a wastewater treatment proposal and critically review the proposal submitted by another team.

TEMPUS CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

PAD 421

Fiscal and Budgetary Policies of Lebanon
Notre Dame University, Faculty of Law and Political Science,
Fall Semester, 2014

Instructor Information

Instructor: Dr. Georges Labaki
Office Location: Zouk Campus
Telephone: Office – 09 218 950 Ext: 2464
Office Hours: T, 9;30-11 AM
E-mail: glabaki@ndu.edu.lb
Website:

Course Identification

Course Number: PAD 421
Course Name: Fiscal and Budgetary Policies of Lebanon
Course Location: University Campus
Class Times: T, 11-12 AM
Prerequisites:
Faculty Web Page:

Course Description/Overview

The course provides a solid background in the study of the main rules governing the Lebanese Budgetary and Fiscal Legislation. A special emphasis is placed on the current financial situation of the Public Finance sector and the policies aiming at curbing the current deficit and the role of Taxes in the promotion of a clean environment specially in terms of renewable sources of energy, housings, industry, tourism, and business.

Course Learning Objectives

By the end of the semester a student should have:

1- Examined the basic budget and fiscal theories.
2- Consider the various types of taxes, the ways in which they are classified, and their characteristic features and the role of the tax system in developing sustainable development.
3- A good understanding of the basic powers and functions of public finance and their role in developing sustainability.
4- Identified the major budgetary and public finance problems faced by Lebanon such as the public debt, the tax pressure, and the role of interest groups in shaping tax policies and the need to focus on such issues like environment and preservation of natural resources.
5- Explored the citizen's role and duties as a voter defending his/her rights to benefit from government funds especially when it comes to sustainability.
6- To provide a good background in the Lebanese Budgetary and Fiscal Policies.
7- To acquaint students with the legal context of Public Finance legislation and to public policy-making.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1- To understand the significance of budgetary and Fiscal processes.
2- To explain the concept of public finance, its significance and implications for citizens and their quality of life.
3- To identify a working vocabulary in the discipline, definition of basic terms and concepts especially in terms of tax expenditures dedicated to sustainability.
4- To explain the discipline of Taxation, its scope, significance, components, and theoretical foundations and the role of interest groups in finding resources and their application in sustainable projects specially at the local level.
5- To be able to create or to be a member of advocacy groups involved in the development of sustainable projects.

Course Resources

Required Course Texts and Materials

Required text books : -Koteiche, Abdel Latif,(2009) The Budget of the State: A Comparative Study, Beirut, Al-Halabi.

- The Code of Taxation, Lebanese Official Journal, 2008.

-The Lebanese Public Accounting Law, Lebanese Official Journal.

Additional Reading:

BOOKS:

- El Gemayel, Antoine, (1985), The Lebanese Legal System, Washington D.C., Georgetown University, International Law Institute.

- Labaki, Georges, (1989),La Fiscalité et le Financement de l"Habitat au Liban,
Paris, L.G.D.J.
-Awada, Hassan,.(n.d.) , Public Finance: A Comparative Study (latest edition), Beirut, Dar-al-Nahda-al-Arabiya.

-Koteiche, Abdel-Raouf,(2007) Income Tax in Lebanon
Beirut, Dar-al-Khulud.

-Chibli, Khatar,(1994), Public Finance, 5th edition, Beirut, Dar-al-Manshurat-al-Hukukiyat, Sader.

- The Lebanese Ministry of Finance Reports and Publications

- Prasard Monica, (2008), The Politics of Free Markets: The Rise of Neoliberal Economic Politics in Britain, Germany, and the US, University of Chicago Press.

- CRS Reports, (2008), The Congressional Appropriation Process: An Introduction, US, The Library of Congress.

- Dye, Thomas, (2008), Understanding Public Policy, (2008), New Jersey, Prentice Hall.

- Rosen, Harvey, (2005), Public Finance, seventh Edition, US, McGrawHill.

Articles and reports

- Labaki, Georges: The Public Finance Crisis, Aouraak Fikr-al-Lubnani, Beirut, Vol. I, 1996.

- Public Finance and Development Policy in Lebanon, Notre Dame University Palma Review, Vol. 2, Spring, 1993.

- The Lebanese Budget of 1994, Palma Review, Vol.2, Issue, no 3,1994.

- The Role of the State under globalization, Byblos Journal, 2008

- Annual Reports of the Lebanese Central Bank.

- Annual Reports of the Beirut Chamber of Commerce

- Monthly Reports of the Lebanese Ministry of Finance.

- The Annual Report of the Account Bureau, Beirut, latest 3 years.

- The Lebanese Budget, for 2005, Lebanese Official Journal.

- Project of the Budget , 2012, 2013.

-Investor's Guide, Etudes et Consultations Economiques, Beirut, (Annual Report).

Readings must be done prior to the class session listed in the distribution of readings. Readings will be part of the exam.

Assignments and Grading Scheme

Weekly Schedule:

Week 1 Introduction
Approaches to Public Budgeting
The Budget as an instrument of Public Policy
Budgetary Strategies and Political Games
The role of the state in to days world
Dye, Ch.2,3
Labaki, G.; The New Role of the State, The Journal of Lebanese Public Administration, Beirut, Board of Civil Service, Vol. 1, 2000.

Weeks 2&3 History of the Lebanese Public Finance since World War I.
The characteristics of the Budget
Koteiche, Abdel-Latif, p.5-127

Week 4 Preparation and approval of the Budget
Role of advocacy groups in the vote of appropriations

Koteiche, Abdel-Latif, p.131-206

Week 5 Nomenclature of the Lebanese Budget
Classification of Expenditures and Taxes
Public policies related to environment
Public Accounting Law
Decisions of the Minister of Finance

Week 6 Implementation and Control of the Budget
Implementation of the Budget
Control of the Budget
Administrative control
Judicial Control
Political Control
Koteiche, Abdel-Latif, p. 296-417

Week 7 Case Studies: The Lebanese Budget of 2005
The Project of the Budgets of 2010 and 2011.
Comparative approach with US and French Budgets
Official Journal of the Lebanese Republic
US and French Legislations
Test I

Week8 The Public Accounting Law
The Lebanese Accounting Law
Koteiche. Abdel-Latif,p. 240-287

Week 9 The Lebanese Tax System

Tax on the Profit of Industrial, Commercial and
Non-Commercial Entreprises
Lebanese Income Tax Law

Week 10 The Lebanese Tax System
Taxes on Salaries and Wages
Lebanese Income Tax Law
Taxes in favor of sustainable development

Week 11 The Income Tax
Tax on Income from Movable Capital
Lebanese Income Tax Law
Environmental taxes
Test II

Week 12 The Value Added Tax
Lebanese VAT Law

Week 13 The Buildings Tax
The Succession and Gifts Tax
Other Direct Taxes
Lebanese Tax Laws

Week 14 Indirect Taxes

(Tax on Inflammables, Cement, and Customs Duties...)
Lebanese Indirect Tax Laws

Week 15 Evaluation of the Lebanese Budgetary and Fiscal System
Means for solving the Lebanese Public Debt
IMF and World Bank Reports
Instructor notes
Conclusion

FINAL EXAM

BREAKDOWN		
#	TOPIC	% of Final Grade
1	Attendance & Class Participation	10%
2	Group/Individual Project & Class Presentation	20%
3	Mid-term Exam	35%
4	Final Exam	35%
Total		100%

Assessment Description:

- Class Participation: includes discussing instructor's presentations, assigned readings, exercises, and case studies etc. that are apt to make the course more enjoyable for both the students and the instructor. Students are expected to read the assigned material and come to class fully prepared to participate in the discussion of the material assigned for that day. Active participation and contribution is expected from each student, noting that discussion of a given subject matter is one of the most effective methods of learning. Since class participation plays a role in the final grade, it is essential that students do not only read the assignments but properly comprehend the material.

- Attendance: Students are expected to attend all classes. Absence, excused or not, does not absolve a student from the responsibility for the work done or for any announcement made during his/her absence. The maximum absences allowed are according to university policy 6 hrs of class work (6 MWF session or 4 TTh sessions).

- Group/Individual Project: Research and fact-finding assignments, which constitute an integral part of the course, are designed to allow the student to apply course concepts, learn how to interact within the group and others, and understand the challenges of working in a competitive and changing environment. The assigned projects shall be conducted either individually or in groups. The Group/Individual Project shall be submitted in soft copy, and hard copy on A4 paper, font 12 Times New Roman, double spacing.

- Class Presentation: Students are required to make specific Class Presentations as will be assigned by the Course Instructor.

- Exams: All exams will be closed book and closed notes. The exam will cover material from lectures, assigned readings, and issues discussed in class. No makeup or early exam will be given, except in very exceptional circumstances. The exams will be designed in a way to assess the students' knowledge and absorption of the course material covered in the assigned readings and instructor's presentations.

Course Schedule

Course	Fiscal and Budgetary Policies
Module 1	What are Public Finance and Taxes?
Key Concepts	Understanding of the basic concepts of public finance and taxes
Overview	The concept of Public Finance and Taxation is difficult to new students especially in the role of the budget in shaping policies and its political impact on citizens. Questions to be addressed in this module include the following: What is the nature and function of Public Finance and the Tax System? Why is it important to meld the theory and practice in Public Finance? What are the major classifications of theories in the field? How has deficits been a catalyst for policy change?
Aim	The overriding aim of this module is to turn students able to discourse on public finance theories, types and functions.
Learning Outcomes	At the end of this module learners will be able to: -Identify the different types of taxes -Discuss how taxes can contribute to sustainable development?
Units	Unit 1.1 Taxes as a Body of Knowledge Unit 1.2: The Tax system as a Process Unit 1.3: Taxes as a practice Unit 1.4: The Context of Public Finance and Taxation
Readings	-Koteiche, Abdel-Raouf,(2007) Income Tax in Lebanon Beirut, Dar-al-Khulud. -Chibli, Khatar,(1994), Public Finance, 5th edition, Beirut, Dar-al-Manshurat-al-Hukukiyat, Sader.

Activity	Overview
	Assignment 1 : Reflecting Upon Public Finance and Tax systems 1. What are the major theories in Public Finance and Taxation? 2. Which theories and approaches are applied abroad? Which ones promote sustainability? To which extend they are successful? 3. " *Assignment 2: Applying Theory* 1. Which theory are you most attracted to? Why? 2. Which theory is applicable in Lebanon? Why? 3. What challenges or obstacles do you face in applying the chosen theory in Lebanon especially when it comes to environment protection? *Assignment 3: Survey* Conduct a brief survey on people awareness about the importance of Public Finance in their life and their expectations

Module 2	Approaches to green taxes infusion in Public Finance
Key Concepts	Understanding budgetary choices
Overview	Financing is key for implementation of green tax policies. This module will outline a whole- approach to infuse green taxes in Public Finance that includes highlights some of the key challenges that must be addressed to make the widespread adoption of the whole-school approach to taxes nature friendly a reality. Questions to be addressed in this module are: -Budgetary preparation processes -How public policy choices are made in the budget? -How to infuse new green taxes in the budget?
Aim	The aim of this module is to enhance understandings of the processes and practices that advance a whole approach to modern taxation.
Learning Outcomes	At the end of this module learners will be able to: -Identify major public policy issues and expenditures

	-Understand the processes to *initiate* a green taxation oriented action plan
Units	Unit 2.1: Clarifying the concept of Public choices Unit 2.2: The processes to initiate climate tax action plans Unit 2.3: The means to implement a whole green taxation approach in the budget Unit 2.3: Examples of approaches to green taxes in the budget. Example to be taken from developed countries experience.
Readings	- CRS Reports, (2008), The Congressional Appropriation Process: An Introduction, US, The Library of Congress. - Dye, Thomas, (2008), Understanding Public Policy, (2008), New Jersey, Prentice Hall. - Rosen, Harvey, (2005), Public Finance, seventh Edition, US, McGrawHill.
Activity	**Overview**
	Design an action plan to establish a list of much needed climate protection oriented projects both at the national and local levels. This list is to be drawn after consultation with stakeholders at national and local levels.
Module 3	Major Lebanese taxes and their contribution to environment protection
Key Concepts	Taxes impact on nature protection, Tariffs, Public choices
Overview	

	Taxes play a major role in promoting of a green environment. There is need to find out what are the major component of the Lebanese tax system, their importance, their impact, the beneficiaries, and the extent to which they are pro or anti environment.
Aim	Awareness about current taxes and future taxes enhancing a clean climate
Learning Outcomes	At the end of this module learners will be able to: Demonstrate knowledge on the principles of taxation policies, and their role in an environment friendly implementation
Units	Unit 3.1: List of Lebanese Taxes Unit 3.2: List of Tax expenditures and their cost Unit 3.3: Designing a new friendly tax policy Unit 3.4: Developing an action plan Unit 3.5: Assessing the thematic instruction
Readings	- El Gemayel, Antoine, (1985), The Lebanese Legal System, Washington D.C., Georgetown University, International Law Institute. - Labaki, Georges, (1989),La Fiscalité et le Financement de l"Habitat au Liban, Paris, L.G.D.J. -Awada, Hassan,.(n.d.) , Public Finance: A Comparative Study (latest edition), Beirut, Dar-al-Nahda-al-Arabiya.
Activity	**Overview** *Assignment 1: Generating Themes* 44. Think of 5 possible themes dealing with taxes aimed at supporting a friendly environment. 45. Next consider whether these themes are important in your

	community at the national and local level 46. Choose one item that is the most important to your country. Explain how does it fit into your community's and personal interest?
Module 4	Advocacy in public policy choices
Key Concepts	Taxes, advocacy, rights , empowerment
Overview	In our times, most countries are suffering from severe financial crisis. Most countries are looking for means to fuel their economies while under looking environmental taxes. Thus, there is a need to improve advocacy to advance environment plans financing and implementation
Aim	The overriding aim of this module is first to explore the potentialities for environmental advocacy, empowerment and capacity building and second to learn to write advocacy proposal techniques
Learning Outcomes	At the end of this module learners will be able to: Demonstrate knowledge on the concept of budget advocacy Plan and develop an advocacy plan
Units	Unit 3.1: Setting advocacy principles Unit 3.2: Developing advocacy choices Unit 3.3: Doing research Unit 3.4: Writing a working frame proposal
Readings	- Prasard Monica, (2008), The Politics of Free Markets: The Rise of Neoliberal Economic Politics in Britain, Germany, and the US, University of Chicago Press. - CRS Reports, (2008), The Congressional Appropriation Process: An Introduction, US, The Library of Congress.

	- Dye, Thomas, (2008), Understanding Public Policy, (2008), New Jersey, Prentice Hall. - Rosen, Harvey, (2005), Public Finance, seventh Edition, US, McGrawHill.
Activity	**Overview**
	Prepare a research advocacy proposal
Module 5	**Production of a written tax proposal aimed at SD implementation**
Key Concepts	Environmental taxes, public choices, development
Overview	There is a need for setting a strategy aimed at convincing public authorities to adopt plans for adoption of green taxes with specific choices as well budgeting and implantation. This final project shall be disseminated in the community to create awareness and promote action plans for green taxes promotion at both national and local levels
Aim	The overriding aim of this module is to equip students with the capacity to act for environmental taxes implementation
Learning Outcomes	At the end of this module learners will be able to: Set an environmental taxes promotion strategy Work with others in groups Be active members in society
Units	Unit 5.1: Drafting the strategy

	Unit 5.2: Be ready for its implementation
Readings	- The Role of the State under globalization, Byblos Journal, 2008 - Annual Reports of the Lebanese Central Bank. - Annual Reports of the Beirut Chamber of Commerce - Monthly Reports of the Lebanese Ministry of Finance. - The Annual Report of the Account Bureau, Beirut, latest 3 years. - The Lebanese Budget, for 2005, Lebanese Official Journal. Windows Movie Maker free online video tutorials from Atomic Learning are available at http://www.atomiclearning.com/moviemaker2. These tutorials are very helpful in learning the various features of Movie Maker. (You will need the QuickTime video player to view the Atomic Learning tutorials. If needed, click on QuickTime to download the latest version.)
Activity	**Overview**
	Prepare the proposal and up load it on the Internet

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

CEN 560: Air Pollution Engineering

NDU-Louaize, Faculty of Engineering, DCEE

Fall 2015

Instructor Information

Instructor: Talal Salem, Assistant Professor

Office Location: Faculty of Engineering E216

Telephone: Office – +961.9.208427

Office Hours: Wednesday 2:00 – 3:00 p.m.

E-mail: tsalem@ndu.edu.lb

Website: http://www.ndu.edu.lb/academics/faculty_research/fe/salem~talal/profile.htm

Course Identification

Course Number: CEN 560

Course Name: Air Pollution Engineering

Course Location: E 107

Class Times: MWF 3:00 – 4:00 p.m.

Prerequisites: CEN 462 – Environmental Engineering
Faculty Web Page: http://www.ndu.edu.lb/academics/fe/intro.htm

Course Description/Overview

Characterization of sources, emissions, transport, transformation, effects, and control of air pollutants.

Course Learning Objectives

The overreaching goals of this course are to provide:
a) Ability to select control systems, components, or processes to meet standards and regulations.
b) Ability to identify, formulate, and solve air pollution engineering problems.
c) Ability to understand the impact of air pollution control solutions in a global and societal context.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Apply fundamental concepts of engineering to solve air pollution problems.
2. Learn various aspects of air pollution in an economic, environmental, and societal context.
3. Identify appropriate systems to control gas phase and particulate air pollutants emissions.
4. Understand the impact of engineering solutions to global air quality problems.

Course Resources

Course Website(s)

- WS1: http://www.epa.org
- WS2: http://www.eea.europa.eu/themes/air
- WS3: http://www.who.org

Required Course Texts and Materials

- TX: Cooper, 2010, *Air Pollution Control - A Design Approach*, 4th Ed., Waveland Press

Optional Course Texts and Materials

- Vallero, D., 2008, *Fundamentals of Air Pollution*, 4th Ed., Academic Press
- Davis W., 2000, *Air Pollution Engineering Manual*, 2nd Ed., Wiley Interscience
- Godish, T., 2004, *Air Quality*, 4th Ed., Lewis Publishers

Assignments and Grading Scheme

Grading System

The University uses the following system of grades. This system consists of letter grades with their corresponding numerical ranges (i.e. percentage equivalent, and the 4.0 point maximum).

Grade	Description	Quality Point Value	Percentage Equivalent
A+	Outstanding	4.0	97-100
A	Excellent	4.0	93 - 96
A-	Very Good	3.7	89 - 92
B+	Good	3.3	85 - 88
B	Good	3.0	80 - 84
B-	Good	2.7	77 - 79
C+	Satisfactory	2.3	73 - 76
C	Satisfactory	2.0	70 - 72
C-	Passing	1.7	66 - 69
D+	Passing	1.3	63 - 65
D	Lowest Passing	1.0	60 - 62
F	Failure	0.0	0 - 59

Grading Policy

Grades are based on the following:

Exams (2 exams x 30 points each)	60%
Project	30%
Class attendance/participation	10%
Total Points	**100**

Midterm and Final Exams (60%): Two exams cover class presentation and assignments. The final exam is comprehensive.

Course Project (30%): Each team project (3 students) will entail conducting a research on a local air quality problem, then writing a report (15%) and presenting the significant findings orally (15%).

Class participation (10%): Students are expected to attend all sessions and participate actively in class discussion.

Course Policies

Late Assignments

While understanding that we all are busy with school, work, and family, your decision to register for this course is an indication that you have made it a high priority. Thus, extensions of assignment due dates are given only in extreme situations (death of a close family member, hospitalization, etc.) and require documentation on your part. Otherwise, due dates are fixed and non-negotiable. All assignments should be submitted on or before the assigned due date. Assignments past the due date will not be accepted for full credit. Examples of unreasonable extensions for an assignment include frequent computer malfunctions, outside class-work, or job responsibilities that inhibit meeting the required deadlines. If you anticipate missing a deadline on an assignment, you should send an e-mail to your instructor before the deadline. Unexcused assignments submitted after the due date may be returned ungraded or assigned a lower evaluation. Whether an extension is allowed will be at the instructor's discretion.

Classroom Protocol

Mobile phones should be turned off and out of sight (i.e. not face-up on the desk but preferably inside purses, backpacks, briefcases, etc. or face down on the desk). Phones may not be answered.
Students must attend class with the required material (i.e. original textbook, notebook, pens, etc.).
Once in class, students are expected to remain in class for the entire period.
English must be the only language spoken in class at all times.

Dissability

Any student who feels s/he may need an accommodation due to a disability should contact the instructor privately to discuss those specific needs.

Important Dates to Remember

Midterm Exam: Wednesday, December 02, 2015
Project Repot submittal: Monday, January 04, 2015
Project Presentations: Friday, January 16, 2015

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines
1	Sep. 25	*Syllabus* *Air Pollution Essentials:* Earth's Atmosphere, Definitions & Types of Pollutants, Regulations.
2	Sep. 28	*Air Pollution Essentials:* Causes, Sources & Effects, Ideal gas Law.
3	Oct. 05	*Air Pollution Essentials:* Concentration Measurements in Gases.
4	Oct. 12	*Physics & Chemistry of Air Pollution:* Air Pollution Physics.
5	Oct. 19	*Physics & Chemistry of Air Pollution:* Systems & Processes.
6	Oct. 26	*Physics & Chemistry of Air Pollution:* Characterization, Air Quality.
7	Nov. 02	*Process Design:* Design Considerations, Engineering Economics.
8	Nov. 09	*Process Design:* Equipment Cost Consideration.
9	Nov. 16	*Air Pollution and Meteorology:* Ambient Air Sampling.
10	Nov. 23	*Air Pollution and Meteorology:* Analysis & Measurement.
11	Nov. 30	*Preventing & Controlling Air Pollution:* Preventing Air Pollution.

12	Dec. 07	*Preventing & Controlling Air Pollution:* Engineering Control Concepts.
13	Dec. 14	*Mobile Sources:* Vehicle Emissions, Emission Controls.
14	Jan. 04	*Indoor Air Quality:* Pollutants of Concern, Source Control & Ventilation.
15	Jan. 11	*Indoor Air Quality:* Practical Solutions to IAQ Problems. *Projects Presentations.*

Course	**Air Pollution Engineering**
Module 1	Control Program History and Human Health
Key Concepts	Climate Change, Regulation, Health
Overview	It is for students to develop a fundamental understanding of the background of legislation related to outdoor and indoor air pollution, and the impact of various pollutants on the climate change and health of humans. Questions to be addressed in this module include the following: What is the existent legislation? What are considered to be the criteria air pollutants? What are the impacts of each pollutant on the respiratory system?
Aim	The overriding aim of this module is to turn students able to discuss the possible future developments of air pollution management and a sustainable policy.
Learning Outcomes	At the end of this module learners will be able to: • Identify and discuss the influences that are affecting the development of air quality management programs and air pollution control legislation. • Identify the components of the human respiratory system and how air pollution

	affects it.
Units	Unit 1.1 An Overview Unit 1.2: NAAQS & Types of Pollutants Unit 1.3: Human Health
Readings	Cooper, 2010, *Air Pollution Control - A Design Approach*, 4th Ed., Waveland Press, pp. 1–69
Activity	*Assignment 1: Understanding the magnitude of air pollution problems* 2. Go to the World health Organization's Web Site (www.who.org). Select a particular air pollutant, and write a report up to two pages on the global magnitude of the problem on climate change and human health and what engineered or policy solutions are needed to deal with this problem. 3. You will have then to prepare a short presentation (PowerPoint) of five minutes to discuss the problem and the suggested solutions.
Module 2	Outdoor Air Pollution Control & Process Design
Key Concepts	PM, Gas emission, Control
Overview	To design or select a system to control outdoor air pollution, students need to understand the physical and chemical properties of different types of emission, and the sampling techniques. The available technologies will be presented and discussed. General design considerations (process flow charts, engineering economics, and cost estimation) will be presented.
Aim	The overriding aim of this module is to enhance students' understanding of the

	processes used in controlling outdoor particulates and gaseous emissions.
Learning Outcomes	At the end of this module learners will be able to: • Identify and describe the control devices for particulate emissions. • Identify and describe the control equipments for gaseous emissions
Units	Unit 2.1: What is process design? Unit 2.2: Control of stationary sources Unit 2.2: Control of mobile sources Unit 2.3: Control of gaseous emissions
Readings	Cooper, 2010, *Air Pollution Control - A Design Approach*, 4th Ed., Waveland Press, pp. 75–134 EPA, *Introduction to Air Pollution Control*, available on: http://www.epa.gov/eogapti1/course_format.html
Activity	*Assignment 2: Measuring particulate concentrations* 4. The equipment shown in figure is available at the environmental laboratory of the Department of Civil & Environmental Engineering of NDU-Louaize. You have to do research about the equipment and explain what it is used for. **5.** You will have then to perform a short demonstration on this device in

	class.
Module 3	Indoor Air Pollution Control
Key Concepts	Ventilation, Sources, Sick Building Syndrome
Overview	We spend most of our time in indoor spaces. The impact of indoor air pollution on our health might be more critical than that of outdoor pollutants because of the time of exposure to contaminants. The different types of pollutants of concern will be presented and discussed. Students will be introduced to methods of estimation and design of needed rates of ventilation in a room.
Aim	The overriding aim of this module is to enhance the students' understandings of the impact of indoor air pollution and to provide them with the information needed to propose solutions to the problem.
Learning Outcomes	At the end of this module learners will be able to: • Identify and describe the control devices for indoor emissions.
Units	*Unit 3.1: Sick Building Syndrome* Unit 3.2: Factors influencing IAQ Unit 3.3: Control of indoor emissions Unit 3.4: Material Balance Model
Readings	Cooper, 2010, *Air Pollution Control - A Design Approach*, 4th Ed., Waveland Press, pp. 695–720 EPA, *Introduction to Air Pollution Control*, available on: http://www.epa.gov/eogapti1/course_format.html
Activity	*Assignment 3: Estimating the indoor air quality of the classroom* 47. Use the ASHRAE's Web Site (www.ashrea.org) to find the values of

	the ventilation rate needed to have a good air quality inside the classroom where the lectures are being given. Write a report up to two pages on the sources of emission in this room and what engineered can be used to deal with this problem 48. Your findings will be discussed in class using a short presentation (PowerPoint) of five minutes.

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

CEN 466: Environmental Pollution and Control

NDU-Louaize, Faculty of Engineering, DCEE

Fall 2015

Instructor Information

Instructor: Elsy Ibrahim/Sophia Ghanimeh, Assistant Professor

Office Location: Faculty of Engineering, HA 363/HA367

Telephone: Office – +961.9.208427

Office Hours: Tuesday 2:00 – 3:00 p.m./Wednesday 2:00 – 3:00 p.m.

E-mail: eibrahim@ndu.edu.lb/ sghanimeh@ndu.edu.lb

Website:

http://www.ndu.edu.lb/academics/faculty_research/fe/elsy~ibrahim/profile.htm

http://www.ndu.edu.lb/academics/faculty_research/fe/sophia~ghanimeh/profile.htm

Course Identification

Course Number: CEN 466
Course Name: Environmental Pollution and Control
Course Location: E 107
Class Times: MWF 1:00 – 2:00 p.m.
Prerequisites: None
Faculty Web Page: http://www.ndu.edu.lb/academics/fe/intro.htm

Course Description/Overview

Concepts and principles to identify and control water, air and noise pollution. This course also provides knowledge on solid waste and hazardous waste management, and the effects of pollution to general health.

Course Learning Objectives

The overreaching goals of this course are to provide:

k) Ability to understand pollution control technologies and insights into basic environmental assessment components

l) Ability to design basic units for the treatment of waste streams and assess their impact on the receiving water body.

m) Ability to design basic facilities for the processing and disposal of municipal solid waste

n) Ability to design basic facilities for the control of air pollution

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Discover correctly the knowledge related to public health and environmental pollution

2. Apply the concept and principles to control or mitigate the environmental pollution appropriately

3. Design systems to control environmental pollution from an engineering perspective

Course Resources

Course Website(s)

- WS1: http://www.epa.org
- WS2: http://ec.europa.eu/environment/index_en.htm
- WS3: http://www.who.org

Required Course Texts and Materials

- Mihelcic and Zimmerman, 2010, *Environmental engineering: fundamentals, sustainability, design*, 1th Edition, John Wiley & Sons, Inc., ISBN-13: 978-0470165058

Optional Course Texts and Materials

- Vesilind, Morgan, and Heine, 2010, Introduction to environmental engineering, Cengage Learning, 3rd edition, ISBN-13: 978-0495295853.
- Metcalf & Eddy, 2003, Wastewater engineering: Treatment and reuse, 4th Edition, McGraw-Hill.
- Tchobanoglous, Theisen, and Vigil, 1993, *Integrated solid waste management: engineering principles and management issues,* McGraw-Hill.

Assignments and Grading Scheme

Grading System

The University uses the following system of grades. This system consists of letter grades with their corresponding numerical ranges (i.e. percentage equivalent, and the 4.0 point maximum).

Grade	Description	Quality Point Value	Percentage Equivalent
A+	Outstanding	4.0	97-100

A	Excellent	4.0	93 - 96
A-	Very Good	3.7	89 - 92
B+	Good	3.3	85 - 88
B	Good	3.0	80 - 84
B-	Good	2.7	77 - 79
C+	Satisfactory	2.3	73 - 76
C	Satisfactory	2.0	70 - 72
C-	Passing	1.7	66 - 69
D+	Passing	1.3	63 - 65
D	Lowest Passing	1.0	60 - 62
F	Failure	0.0	0 - 59

Grading Policy

Grades are based on the following:

Tests (2 tests x 22.5 points each)	45%
Final Exam	30%
Project	20%
Class attendance/participation	5%
Total Points	**100**

Tests and Final Exams (75%): Two tests cover class presentation and assignments. The final exam is comprehensive.

Course Project (20%): Each team project (3 students) will entail analyzing a local environmental problem and/or designing a facility to treat a stream of water, wastewater, solid waste or air, then writing a report (15%) and presenting the significant findings orally (5%).

Class participation (5%): Students are expected to attend all sessions and participate actively in class discussions.

Course Policies

Late Assignments

While understanding that we all are busy with school, work, and family, your decision to register for this course is an indication that you have made it a high priority. Thus, extensions of assignment due dates are given only in extreme situations (death of a close family member, hospitalization, etc.) and require documentation on your part. Otherwise, due dates are fixed and non-negotiable. All assignments should be submitted on or before the assigned due date. Assignments past the due date will not be accepted for full credit. Examples of unreasonable extensions for an assignment include frequent computer malfunctions, outside class-work, or job responsibilities that inhibit meeting the required deadlines. If you anticipate missing a deadline on an assignment, you should send an e-mail to your instructor before the deadline. Unexcused assignments submitted after the due date may be returned ungraded or assigned a lower evaluation. Whether an extension is allowed will be at the instructor's discretion.

Classroom Protocol

Mobile phones should be turned off and out of sight (i.e. not face-up on the desk but preferably inside purses, backpacks, briefcases, etc. or face down on the desk). Phones may not be answered.
Students must attend class with the required material (i.e. original textbook, notebook, pens, etc.).
Once in class, students are expected to remain in class for the entire period.
English must be the only language spoken in class at all times.

Dissability

Any student who feels she/he may need an accommodation due to a disability should contact the instructor privately to discuss those specific needs.

Important Dates to Remember

Test 1: Thursday, December 11, 2014
Test 2: Thursday, February 05, 2015
Project Repot submittal: Monday, January 05, 2015
Project Presentations: Monday, January 12, 2015

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines
1	Sep. 25	Syllabus

		Introduction : Overview of various chapters
2	Sep. 29	Chemical & Physical Processes
3	Oct. 06	Wastewater Treatment: Physical Processes
4	Oct. 13	Wastewater Treatment: Aerobic Biological Processes
5	Oct. 20	Wastewater Treatment: Anaerobic Biological Processes (sludge treatment)
6	Oct. 27	Water Treatment: Coagulation/Flocculation, Filtration
7	Nov. 3	Water Treatment: Membrane Processes, Disinfection
8	Nov. 10	Water Quality: Oxygen Depletion and Impacts of Nutrients/Pollutants Discharge
9	Nov. 17	Solid Waste Management: Collection and Material Recovery
10	Nov. 24	Solid Waste Management: Collection and Material Recovery
11	Dec. 01	Solid Waste Management: Disposal (Landfilling)
12	Dec. 08	Air Resources Engineering: Criteria Pollutant and Particulate Emission Control
13	Dec. 15	Project Guidance
14	Jan. 05	Built Environment: Sustainable Engineering Design
15	Jan. 08	Introduction to EIA: Local Regulations and EIA Reporting
16	Jan. 12	Project Presentations

Course	Environmental Pollution and Control
Module 1	Water and Wastewater Treatment and Discharge
Key Concepts	Contaminants, Physical/Biological/Chemical Treatment, Oxygen Depletion
Overview	This module introduces the students to main contaminants in water and wastewater and addresses key processes to remove them. The impact of wastes discharge into natural water streams is also considered. Questions to be addressed in this module include the following: How to design a wastewater (secondary) treatment plant? What is the impact of discharging the effluent of a wastewater treatment plant into a nearby water body? How to reduce water turbidity and hardness?
Aim	The students should be able to design the basic components of a wastewater treatment plant (up to the secondary treatment level). They should understand the main concepts of water treatment: coagulation/flocuulation, hardness removal, filtration, membrane processes and disinfection. In addition, the students should be able to calculate the oxygen deficit induced by wastewater disposal and assess its impact, along with the impact of other pollution-related phenomena, on the aquatic fauna and flora.
Learning Outcomes	At the end of this module learners will be able to: • Design a wastewater secondary treatment plant • Identify key water treatment concepts through: identifying the components of physical processing units and calculating dosing requirements in chemical processing units • Quantify the impact of pollution on water streams.

Units	Unit 1.1 Physical and chemical processes Unit 1.2: Wastewater treatment Unit 1.3: Water treatment Unit 1.4: Water quality
Readings	Mihelcic and Zimmerman, 2010, 1th Edition, John Wiley & Sons, Inc., Chapters 3, 4, 11, 10 and 8.
Activity	*Quiz 1: Chemical and Physical Processes* This quiz is crucial to assess the students' assimilation of the newly introduced concepts of chemical and physical processes in environmental design. Unsatisfactory entails revisiting chapters 3 and 4. *Field Trip 1: Water/Wastewater Treatment Plant*
Module 2	Solid Waste Management
Key Concepts	Collection, Material Recovery Facility, Landfill
Overview	This module introduces the students to different waste sources and components. It considers collection, processing and disposal of municipal solid waste with emphasis on material recovery facilities.
Aim	The students should be able to see the big picture of solid waste management and identify its various components.
Learning Outcomes	At the end of this module learners will be able to: • Categorize solid wastes by type and source, identify the different components of waste and calculate waste generation.

	• Design the basic components of a material recovery facility. • Provide basic design requirements of a landfill
Units	Unit 2.1: Waste generation and characterization Unit 2.2: Collection and material recovery Unit 2.2: Disposal
Readings	Mihelcic and Zimmerman, 2010, 1th Edition, John Wiley & Sons, Inc., Chapter 13.
Activity	*Team Project and Presentation* The students are asked to work, in teams of three, on an assigned project that includes a design component toward solving a local environmental problem. A full technical report should be submitted and an oral presentation needs to be delivered (by all team members).

Module 3	Air Pollution Control, Built Environment and Impacts Assessment
Key Concepts	Pollutant Criteria, Sustainable Design, EIA
Overview	This module introduces the students to air pollution and control concepts and addresses key sustainability issues in engineering design. Also, it covers basic processes and reporting components in environmental impact assessments.
Aim	At this stage, the students should be able to link all environmental risks of a project (including water, wastes and air related issues) into one assessment report and know how to incorporate it into their design concepts.
Learning Outcomes	At the end of this module learners will be able to: • Identify air criteria pollutants, their source and impacts • Apply basic concepts for the design of particulate emissions control systems. • Identify key requirements for a sustainable design. • Identify the major constituents of an EIA report
Units	Unit 3.1: Air pollution and particulate emissions control Unit 3.2: Built environment Unit 3.2: Environmental impact assessment
Readings	Mihelcic and Zimmerman, 2010, 1th Edition, John Wiley & Sons, Inc., Chapters 12 and 14.

Activity	*Field Trip 2: Solid Waste Processing and Disposal* This trip should include the material recovery facility and the composting plant in Beirut (the largest in the country), in addition to a local landfill.

CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

ENG 360: Renewable Energy Technologies
NDU-Louaize, Faculty of Engineering, DCEE
Fall 2014

Instructor Information

Instructor: Talal Salem, Assistant Professor
Office Location: Faculty of Engineering E216
Telephone: Office – +961.9.208427
Office Hours: Friday 2:00 – 3:00 p.m.
E-mail: tsalem@ndu.edu.lb
Website: http://www.ndu.edu.lb/academics/faculty_research/fe/salem~talal/profile.htm

Course Identification

Course Number: ENG xxx

Course Name:	Renewable Energy Technologies
Course Location:	E 107
Class Times:	MWF 1:00 – 2:00 p.m.
Prerequisites:	No Prerequistes
Faculty Web Page:	http://www.ndu.edu.lb/academics/fe/intro.htm

Course Description/Overview

Principles of renewable technologies for sustainable future. Process design, energy analysis, engineering economics and environmental assessment of renewable energy systems and techniques and applications of solar, wind, biomass, geothermal, hydro-electric, wave and tidal energy technologies. More emphasis is given to solar energy technologies to convert solar radiation into heat or electricity.

Course Learning Objectives

The overreaching goals of this course are to provide:

e) Ability to recognize the need of renewable energy technologies and their role in the global and local context.

f) Ability to distinguish between the sustainable energy sources and fossil energy sources.

g) Ability to describe the principles of renewable energy production from various renewable sources.

h) Ability to conduct a preliminary evaluation of the performance of an energy conversion system for maximum efficiency

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Learn various aspects of renewable energy technologies in an economic, environmental, and societal context

2. Apply fundamental concepts of engineering to identify the appropriate renewable energy systems required for specific applications.

3. Compare various technologies and propose the best possible energy conversion system for a particular location.

Course Resources

Course Website(s)

- WS1: http://energy.gov/eere/office-energy-efficiency-renewable-energy
- WS2: http://www2.ademe.fr/
- WS3: http://www.epa.gov/statelocalclimate/state/topics/renewable.html

Required Course Texts and Materials

- TX: Schaeffer, J. 2007. *Real Goods Solar Living Sourcebook: The Complete Guide to Renewable Energy Technologies and Sustainable Living*, 30th Anniversary Ed., Gaiam

Optional Course Texts and Materials

Wengenmayr, R., Bührke,T., 2008, *Renewable energy : sustainable energy concepts for the future*, Wiley-VCH, 118 pages (ISBN: 9783527408047).

- Boyle, G., 2004. *Renewable Energy* , 2nd Ed., Oxford University Press, 450 pages (ISBN: 0-19-926178-4).

Assignments and Grading Scheme

Grading System

The University uses the following system of grades. This system consists of letter grades with their corresponding numerical ranges (i.e. percentage equivalent, and the 4.0 point maximum).

Grade	Description	Quality Point Value	Percentage Equivalent
A+	Outstanding	4.0	97-100
A	Excellent	4.0	93 - 96
A-	Very Good	3.7	89 - 92
B+	Good	3.3	85 - 88
B	Good	3.0	80 - 84
B-	Good	2.7	77 - 79
C+	Satisfactory	2.3	73 - 76

C	Satisfactory	2.0	70 - 72
C-	Passing	1.7	66 - 69
D+	Passing	1.3	63 - 65
D	Lowest Passing	1.0	60 - 62
F	Failure	0.0	0 - 59

Grading Policy

Grades are based on the following:

Midterm	30%
Project	30%
Final Exam	30%
Class attendance/participation	10%
Total Points	**100**

Exams (60%): Two exams cover class presentation and assignments. The final exam is comprehensive.

Project (30%): One project covers a local case study

Class participation (10%): Students are expected to attend all sessions and participate actively in class discussion.

Course Policies

Late Assignments

While understanding that we all are busy with school, work, and family, your decision to register for this course is an indication that you have made it a high priority. Thus, extensions of assignment due dates are given only in extreme situations (death of a close family member, hospitalization, etc.) and require documentation on your part. Otherwise, due dates are fixed and non-negotiable. All assignments should be submitted on or before the assigned due date. Assignments past the due date will not be accepted for full credit. Examples of unreasonable extensions for an assignment include frequent computer malfunctions, outside class-work, or job responsibilities that inhibit meeting the required deadlines. If you anticipate missing a deadline on an assignment, you should send an e-mail to your instructor before the deadline. Unexcused assignments submitted after the due date may be returned ungraded or assigned a lower evaluation. Whether an extension is allowed will be at the instructor's discretion.

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Students must attend class with the required material (i.e. original textbook, notebook, pens, etc.).
Once in class, students are expected to remain in class for the entire period.
English must be the only language spoken in class at all times.

Dissability

Any student who feels s/he may need an accommodation due to a disability should contact the instructor privately to discuss those specific needs.

Important Dates to Remember

Midterm Exam: Monday, November 03, 2014
Project Repot submittal: Friday, December 19, 2014
Project Presentations: Monday, January 12, 2015

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines
0	Sep. 26	*Syllabus*
1	Sep. 29	*Introduction:* Energy consumption & Demand, Renewable vs fossil energy sources *Overview of Renewable Energy Technologies:* Renewable energy sources, Advantages and benefits, Available technologies and challenges.
2	Oct. 06	*Solar energy:* Solar radiation
3	Oct. 13	*Solar energy:* fundamentals of thermal exchange
4	Oct. 20	*Solar energy:* Solar thermal systems
5	Oct. 27	*Solar energy:* fundamentals of photovoltaic

6	Nov. 03	*Solar energy:* photovoltaic systems
7	Nov. 10	*Biomass and Bioenergy:* Biomass resources
8	Nov. 17	*Biomass and Bioenergy:* Conversion technologies
9	Nov. 24	*Wind energy:* : Resources
10	Dec. 01	*Wind energy:* Turbines and power generating systems
11	Dec. 08	*Geothermal energy:* Resources
12	Dec. 15	*Geothermal energy:* Principles, operation and recovery of energy
13	Jan. 05	*Energy economics*
14	Jan. 12	*Environmental assessments*
15	Jan. 19	*Project*

Course	**Renewable Energy Technologies**
Module 1	Solar Energy
Key Concepts	Solar radiation, Thermal, PV
Overview	The students will be introduced to the fundamentals of solar radiation. The difference between solar thermal (to produce heat) and solar photovoltaic (to produce electricity) will be highlighted. Students have to develop a basic understanding of the impact of various types of modules and their orientations on the choice of the best system to be applied. Questions to be addressed in this module include the following: What is the existent local legislation? Is there any governmental support (incentives) to promote solar energy application? What are the environmental impacts of each solution?
Aim	The overriding aim of this module is to turn students able to suggest the best solar system for a certain application and to be able to do a preliminary design of the solar

	system.
Learning Outcomes	At the end of this module learners will be able to: • Identify the best solar system for a given application. • Conduct a preliminary design of solar systems.
Units	Unit 1.1 An Overview Unit 1.2: Thermal Unit 1.3: Photovoltaic
Readings	Schaeffer, J. 2007. *Real Goods Solar Living Sourcebook: The Complete Guide to Renewable Energy Technologies and Sustainable Living*, 30th Anniversary Ed., Gaiam
Activity	*Assignment 1: Identifying the different types of solar energy systems* 4. Go to the NDU's Library Web Site (www.ndu.edu.lb). Select a reliable reference on renewable energy and write a report up to two pages on the solar applications in buildings.
Module 2	Outdoor Air Pollution Control & Process Design
Key Concepts	Solar, Biomass, Wind, Geothermal
Overview	To select a system to produce heat or electricity from renewable resources, students need to understand the physical properties of different types of systems, and the environmental impact in terms of climate change and CO_2 emissions. The available technologies will be presented and discussed.
Aim	The overriding aim of this module is to enhance students' understanding of the renewable energy systems (Solar, biomass, wind and geothermal) used to reduce the dependence on fossil fuel systems.
Learning Outcomes	At the end of this module learners will be able to: • Identify and describe the different types of renewable energy systems. • Select the proper system for a specific application
Units	Unit 2.1: Biomass applications Unit 2.2: Wind energy applications

	Unit 2.2: Geothermal energy applications Unit 2.3: Solar vs. Biomass vs. Wind vs. Geothermal: A comparison
Readings	Schaeffer, J. 2007. *Real Goods Solar Living Sourcebook: The Complete Guide to Renewable Energy Technologies and Sustainable Living*, 30th Anniversary Ed., Gaiam Aldo Da Rosa, A. 2013. *Fundamentals of Renewable Energy Processes* (Third Edition), edited by Academic Press, Boston, 2013, Pages i-ii, ISBN 9780123972194, http://dx.doi.org/10.1016/B978-0-12-397219-4.00019-9.
Activity	*Assignment 2: Sustainable energy project* 6. A group/individual sustainable energy project to suggest and study the feasibility of renewable energy projects across the University campus. 7. Students will closely work with NDU physical plant to seek help on energy related data for their projects 8. Students will have then to perform a short demonstration on this device in class.
Module 3	Energy, Economics and Environmental Assessments
Key Concepts	Economics, EIA, Policy
Overview	General design considerations (process flow charts, engineering economics, and cost estimation) will be presented.
Aim	The overriding aim of this module is to expand the students' understandings of and reasoning skills related to renewable energy choices, issues, and policies in the context of the varied social, economic and environmental implications of production, distribution and use.
Learning Outcomes	At the end of this module learners will be able to: • Assess alternative energy sources • Conduct environmental impact assessment for a selected design
Units	*Unit 3.1:* Technical and economical assessment of renewable technology Unit 3.4: Environmental impact assessments and sustainability issues
Readings	Schaeffer, J. 2007. *Real Goods Solar Living Sourcebook: The Complete Guide to Renewable Energy Technologies and Sustainable Living*, 30th Anniversary Ed., Gaiam

Activity	*Assignment 3: Comparative analysis and environmental assessment* 49. Use a multi-criteria approach to assess different options for a specific application considering the energy, economics and environmental impacts 50. Conduct an EIA for the best renewable energy system selected 51. Your findings will be discussed in class using a short presentation (PowerPoint) of five minutes.

Course Syllabus

FOREIGN DIRECT INVESTMENT

FDI 626

Notre Dame University, Faculty of Law and Political Science,
FALLSemester, 2014-2015

Instructor Information

Instructor: Dr. Georges Labaki
Office Location: Zouk Campus
Telephone: Office – 09 218 950 Ext: 2464
Office Hours: F 4-5 PM
E-mail: glabaki@ndu.edu.lb
Website:

Course Identification

Course Number: FDI 626
Course Name: Foreign Direct Investment
Course Location: University Campus
Class Times: F, 5-8 PM
Prerequisites:
Faculty Web Page:

Course Description/Overview

A study of FDI in developed as well as in developing countries. Topics covered: international business transactions including: the legal form of FDI (Joint Ventures, offshore, holdings and joint stock companies), laws governing access to foreign markets, mergers and acquisitions, arbitration, political risk, investments in renewable sources of energy, sustainable investments, arbitration, promotion of fait trade, and strategies in foreign investments, trends and patterns, regional and international inflow of FDI. The course is supplemented by case studies on FDI in the USA, Europe, China, and Japan

Course Learning Objectives

Highly interactive, the objectives for the FDI course are:

1- To allow students to have a basic understanding of FDIs and to show how firms do business among the more of 197 countries of the world.

2. To provide ample opportunities for relating theories to realities of everyday life through numerous case studies.

3- To study the impact of international organizations on world investments.

4- To be able to allow the assessment of the impact of FDIs on climate change, natural resources, the environment, developed and developing countries.

5- To possess the ability to discuss means for critical analysis of FDIs policy issues specially in the area of climate change and their impact on human development.

6-To be able to create or to be a member of advocacy groups involved in the development of fair trade with respect to environment and climate change protection.

7-To be able to assess and write policy papers intended to encourage SD in international investments.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

By the end of this course students will be able to:

6- To understand key concepts in Foreign Direct Investment.
7- To explain the significance and implications of FDIs on nations and people specially when it comes to climate change and the protection of environment.
8- To identify the major issues related to FDIs impact on environment and climate change.
9- To explain the major rule of FDIs, their scope, significance, components, theoretical bases and its many changing patterns.

5- To find alternative ways of international trade focusing on ESD and preservation of natural resources and better policies concerning climate change.
6-To be able to write policy papers and work with groups advocating for fair trade and for a better sharing of resources and protection of climate change effects.

Course Resources

Required Course Texts and Materials

Required Text books :
Textbooks:
- Borja, Bijit, (2004)
Foreign Direct Investment,
US, Routledge Studies in International Business and the World Economy

- UNCTAD, (2007)
World Investments Prospects: 2007-2009
UN, NY.

- Economist Intelligence Unit, (2007)
World Investment Prospects to 2011 and the Challenge of Political Risk,
US, Columbia Program of International Investments

Readings:

- Hearth,D, et Al.(2004)
Contemporary Investments,
Canada, Thomson Publishing Company..

- Wei, Y.A., et AL. (2004)
FDI Six Countries Case Studies
US, EE, New Horizons in International Business

- Hitt. M. et Al, (2001)
Mergers and Acquisitions.
UK, Oxford University Press

- AUGUST, Ray, (1997),
International Business Law, Second Edition
New Jersey, Prentice Hall.

- Francis, John, (1993)
The Politics of Regulation,
U.S.A., Blackwell Publishers, 1993.

- Material provided by the instructor.

Websites:

www.unctad.org – **A number of reports on global and regional investment trends,**

www.oecd.org – **global foreign investment trends, country investment guides, investment reviews, analysis**

www.columbia.edu/cu/libraries/indiv/business/guides/fordinv.html – **a wide range of links to statistical information on global foreign direct investment.**

www.doc.gov - **U.S Department of Commerce website contains a wealth of information on industrial trends, overseas investment statistics, etc.**

www.ita.gov – **USDOC International Trade Administration - foreign/global industry studies, export statistics**

www.usatrade.gov – Foreign Commercial Service – country commercial analyses, partner identification program, etc

www.itd.org – A joint venture between the World Bank and WTO, the site contains links to a wide range of country and regional reports, information local government agencies.

www.opic.gov – Outline of the financing and insurance programs available for American firms investing overseas. A range of country and general information links for investors.

Readings must be done prior to the class session listed in the distribution of readings. Readings will be part of the exam.

Readings must be done prior to the class session listed in the distribution of readings. Readings will be part of the exam.

Grading Scheme

BREAKDOWN		
#	TOPIC	% of Final Grade
1	Attendance & Class Participation	10%
2	Group/Individual Project & Class Presentation	40%
3	Paper	20%
4	Final Exam	30%

Total	100%

Assessment Description:

- Class Participation: includes discussing instructor's presentations, assigned readings, exercises, and case studies etc. that are apt to make the course more enjoyable for both the students and the instructor. Students are expected to read the assigned material and come to class fully prepared to participate in the discussion of the material assigned for that day. Active participation and contribution is expected from each student, noting that discussion of a given subject matter is one of the most effective methods of learning. Since class participation plays a role in the final grade, it is essential that students do not only read the assignments but properly comprehend the material.

- Attendance: Students are expected to attend all classes. Absence, excused or not, does not absolve a student from the responsibility for the work done or for any announcement made during his/her absence. The maximum absences allowed are according to university policy 6 hrs of class work (6 MWF session or 4 TTh sessions).

- Group/Individual Project: Research and fact-finding assignments, which constitute an integral part of the course, are designed to allow the student to apply course concepts, learn how to interact within the group and others, and understand the challenges of working in a competitive and changing environment. The assigned projects shall be conducted either individually or in groups. The Group/Individual Project shall be submitted in soft copy, and hard copy on A4 paper, font 12 Times New Roman, double spacing.

- Class Presentation: Students are required to make specific Class Presentations as will be assigned by the Course Instructor.

Paper:

Term Paper: Each student is supposed to write a paper, approximately 20 to 30 pages in length, related to the course material. You must submit a two-page summary of the topic that you have chosen for the paper along with a list of references that will be featured in your paper no later April, 9. The completed paper is due on June, 9. The paper must be typed and double spaced. Plagiarism will not be tolerated under any circumstances, and will lead to an "F" for their papers.

The term paper will be graded according to its organization, quality of thinking, originality, use of the English language, number of references, length,...

- Exams: All exams will be closed book and closed notes. The exam will cover material from lectures, assigned readings, and issues discussed in class. No makeup or early exam will be given, except in very exceptional circumstances. The exams will be designed in a way to assess the students' knowledge and absorption of the course material covered in the assigned readings and instructor's presentations.

Course Schedule

Week 1

Definition of FDI
Types of FDI
Ray, A. Ch. 5

Week 2

Conditions required attracting FDI
The place dedicated to environmental and climate change issues
Supervision of FDI and their impact on climate change
Arbitration

- Graham, J. & Spaulding B., *Understanding FDI*, c. City Bank, 2007.

Ray, A. Ch. 5

Weeks 3&4

Laws Governing Access to Foreign Markets
Role of sustainable Development principles
- Augusti et Al., *International Business Law and Its Environment*, US International Thomson Publishing, 2001, Ch 11.
- Ray, Ch. 7

Week 5

Trends and Patterns in FDI
The challenge of protection of environment
The study of the impact of investments on climate change
- Christiansen, H., *Trends and Recent Developments in FDI*, OECD, 2007.
- UN, UNCTAD, *World Investment Prospects, 2007-2009*, NY, Ch. III.

Weeks 6&7

The Multinational Company
Environmental concerns of multinational companies?
Ray, A., Ch. 4

Week 8

Merger and Acquisitions and their impact on climate change

Hitt, M, Chap3-4

Week 9

FDI and Political Risk
FDI and climate change

Daniels, J. et Al., Ch. 3.
Case Study; Political Risk and Energy Supply
Economist Intelligence Unit, Chap III.

Week 10

Regional Inflow of FDI
International Flow of FDI
FDI in Lebanon
Impact assessment on climate change

- Economist Intelligence Unit, Ch. II.
- Lebanese Investment Law, Idal)

Week 11

FDI in the US
Impact on climate change

-Jackson, J., CRS report for Congress, *Foreign Direct Investment in the United States*, Washington DC, Library of Congress, 2007.

-US Department of Treasury, Committee Report on Foreign Investments in the US (CFIUS), Washington DC, 2007.

Week 12

FDI in the EU
Impact on climate change
- UNCTAD, *Geographical Breakdown of international investment projects in Europe by selected industry*, Annex 4.

Week 13

FDI in China
Impact on climate change
- Wei, Y.A., FDI in China, Ch. 2
- Daniels, J. and Al., *FDI Investments in China*, Ch. 11.
- Boker, Pitman, *Implications of China Accession to the WTO*, China Quarterly, n167, 2001.

Week 14

FDI in India
FDI in Saudi Arabia
Impact on climate change

- Wei, Y.A., FDI in India, Ch. 3
- Saudi Arabia Foreign Capital investment Law, Arab Law Quarterly, Vol. 16, 2001.
- Daniels, J. Et Al., Ch. 2, Adjusting to Saudi Arabia Culture.

Week 15

Impact of FDI on home and host developing and transition economies
Corporate social responsibility
UNCTAD, UN, Conclusions *and policy implications adapting to threats and opportunities* p.59-62.

General Conclusion

Course	**Foreign Direct Investments**
Module 1	What is the Scope of FDIs?
Key Concepts	Understanding of the basic concepts of FDIs
Overview	Under globalization FDIS are a key element in shaping domestic policies. Its impact on citizens is critical for employments opportunities are more depending on international competition. Questions to be addressed in this module include the following: What are FDIs? What does it encompass? Why is it important to meld the theory and practice? What are the major classifications of theories in the field? How has financial crisis been a catalyst for policy change?
Aim	The overriding aim of this module is to turn students able to discourse on FDIs foundations, areas, and volume.
Learning Outcomes	At the end of this module learners will be able to: • Identify the different elements of FDIs • Discuss how international can contribute to sustainable development preserving resources for future generations?

Units	Unit 1.1 FDIs evolution since the nineties Unit 1.2: FDIs trends and patterns Unit 1.3: FDIs types Unit 1.4: The current Context of FDIs
Readings	-Bohlman, M Herbert,(2002) The Legal, Ethical and International Environment Of Business, Fifth Edition Cincinati, West Legal Studies. -Agusti Earle Shaffer, (2002) International Business Law and Its Environment, Fifth Edition Cincinnati, West Legal Studies. - - Graham, J. & Spaulding B., *Understanding FDI*, c. City Bank, 2007. Ray, A. Ch. 5
Activity	**Overview** *Assignment 1 : Reflecting Upon current trends in Foreign Direct Investments* 1. What are the major theories, trends, and patterns related to FDIs especially in relation to the state role?

	2. Which ones promote climate change protection? To which extend they are successful? *Assignment 2: Applying Theory* 4. Which theory are you most attracted to? Why? 5. What challenges are faced with in applying your chosen theory on trade in developing countries and Lebanon especially when it comes to climate change and environment protection?
Module 2	The environment of international trade
Key Concepts	FDIs and opening of boundaries to trade
Overview	The current international trade system has been promoted the beginning of the nineties. It is based on the principle on international and regional economic integration through the creation of free trade areas, deregulation, and Direct Investments across boundaries.
Aim	The aim of this module is to enhance the understanding of the role of markets in attracting international investments in a global world.

Learning Outcomes	At the end of this module learners will be able to: -Identify the conditions for opening markets to FDIs -Understand the growing role of international and regional organizations in the promotion of international trade
Units	Unit 2.1: Clarifying the conditions for accepting FDIs Unit 2.2: The role of states Unit 2.3: The role of multinational enterprise Unit 2.4 : FDIs In Lebanon
Readings	Trends and Patterns in FDI - Christiansen, H., *Trends and Recent Developments in FDI*, OECD, 2007. - UN, UNCTAD, *World Investment Prospects, 2007-2009*, NY, Ch. III.
Activity	**Overview**
	A detailed research on FDIs as and their legal international structure and their impact of FDI on home and host developing and transition economies Corporate social responsibility: The need to take care of the impact of investments on climate change and on social on society

Module 3	FDIs and their impact on climate change
Key Concepts	The major areas of FDIs
Overview	The major principles of international trade law such as waiving technical and non technical barriers to trade, s and elimination of every barrier to exchange.
Aim	Awareness about current taxes and future taxes enhancing climate protection
Learning Outcomes	At the end of this module learners will be able to: Demonstrate knowledge on the principles of the basic trends in FDIs and their impact on sustainability and climate
Units	Unit 3.1: Major principles of FDIs Unit 3.2: Their implementation Unit 3.3:Their impact on climate change in terms of corporate responsibility, fair trade, renewable sources of energy
Readings	-UNCTAD, UN, Conclusions *and policy implications adapting to threats and opportunities* p.59-62. -Folsom, H Ralph, (2001) International Trade and Investment, Second Edition USA, West Group.
Activity	**Overview** *Assignment 1: Generating Themes*

	52. Consider one of the indicated themes of this module. 53. Next explain the modalities of its implementation in Lebanon (case study: investments in renewable sources of energy) 54. Explain which impact it has on climate? 55. Next consider the corporate social responsibility related to FDIs in Lebanon
Module 4	Approaches to climate change protection infusion in FDIs
Key Concepts	Advocacy, empowerment, capacity building, international lobbying, sustainability, new approach to development and investments, renewable sources of energy, fair trade, corporate social responsibility
Overview	In our times, the majority of states are suffering from severe financial crisis due to lack of competitively. Those countries are looking for means to restore their economies while under looking climate change impact. Thus, there is a need to improve advocacy to advance climate protection along with other environmental issues in international trade
Aim	The aim of this module is first to explore the potentialities for climate change advocacy, empowerment and capacity building at the international level.
Learning Outcomes	At the end of this module learners will be able to develop an advocacy action plan preserving resources for future generations
Units	Unit 3.1: Setting advocacy principles Unit 3.2: Developing advocacy choices specific to Lebanon such as: investments in sustainable energy sectors, impact assessment of climate change and on environment a large. Unit 3.3: Doing detailed research on the current and future trends of FDIs in Lebanon Unit 3.4: Writing a proposal on climate change assessment procedures
Readings	

	- Prasard Monica, (2008), The Politics of Free Markets: The Rise of Neoliberal Economic Politics in Britain, Germany, and the US, University of Chicago Press. - Economist Intelligence Unit, Ch. II. - Lebanese Investment Law
Activity	**Overview**
	Prepare a research advocacy proposal
Module 5	Advocacy in international trade
Key Concepts	ESD , taxes, public choices, development
Overview	There is a need for setting a strategy aimed at convincing international and regional trade organizations to adopt plans for climate change protection with specific choices. This final project shall be disseminated at the global level to create awareness and promote action plans for climate change protection in the framework of SD promotion at both national and local levels.
Aim	The overriding aim of this module is to equip students with the capacity to act for SD implementation in cooperation with international advocacy groups.
Learning Outcomes	At the end of this module learners will be able to: Set a climate change procedure assessment strategy in international trade Work with others in groups Be active members in society

Units	Unit 5.1: Drafting the strategy Unit 5.2: Work for its implementation Unit. 5.3: Lobbying Lebanese decisions makers and civil society for its implementation
Readings	-Annual Report of the US Trade Commission -Annual Reports of the World Trade Organization.
Activity	**Overview**
	Prepare the working plan and up load it on internet.

TEMPUS CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

PUBLIC INTERNATIONAL LAW

IAF 401

Notre Dame University, Faculty of Political Science, Public Administration and Diplomacy

SPRING Semester, 2012-2013

Instructor Information

Instructor: Dr. Georges Labaki
Office Location: B 266 The Green Building
Telephone: 09 218 950 Ext: 2464
Office Hours: M 12:00-1:00 PM
E-mail: glabaki@ndu.edu.lb
Website: ndu.edu.lb

Course Identification

Course Number: IAF 401
Course Name: PUBLIC INTERNATIONAL LAW
Course Location: HA 303
Class Times: MWF 11-12:00
Prerequisites: N/A
Faculty Web Page: http://www.ndu.edu.lb/academics/fpspad/intro.htm

Course Description/Overview

Course Objectives: A study of the sources and development of international law, with special emphasis given to current trends and problems. A critical evaluation of contemporary problems of world order is provided, covering legal issues, war, and economic development.

Topics include: the role of the state in the current international legal system, treaties, peaceful solutions of problems, the preservation of natural resources, the law of the sea, the law of war, ethics, and state credibility in the international system.

Course Learning Objectives

This course aims at providing the following learning objectives:

-Identify the sources, principles, concepts and law-making procedures which underpin the international legal system;

-Understand the international environmental law negotiation process;

-Examine and interpret the content of environmental l laws treaties.

-Differentiate the role of main actors involved in the development of international environmental law;

-The understanding of major legal challenges faced by the international community today.

- To examine and evaluate the practical application of international law and its response to contemporary international issues.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

Learning Outcome 1

Demonstrate a good knowledge of the nature of the basic institutional structure of international society and of the nature of Statehood;

Learning Outcome 2

Explain how international law is made and the relationship between international law and municipal law;

Learning Outcome 3

Demonstrate an awareness of the political, social, economic and other factors that affect international law-making processes;

Learning Outcome 4

Demonstrate the ability to explain how the rules of public international law would apply to a particular case and to critically examine questions about a substantive area of international law.

Learning Outcome 5

To be able to analyze and critically evaluate the principles, sources and vocabulary of international law, and to use the special terminology of international law

Learning Outcome 6

Demonstrate, when discussing and writing about any particular rule of international an ability to say whether the rule in question derives from a treaty or custom;

Course Resources

Course Website(s)

This course is based on Blackboard.

On line resources:

-www. Law.ox.ac.uk/PIL/
-www. Worldlii.org/catalog/169.html
-www. Catalaw.com/topics/PublicInternational.shtml

Required Course Texts and Materials

GLAHN Von Gerhard: Law Among Nations, An Introduction to Public International Law, Latest Edition, New York, Macmillan Publishing Company, 2010.

Optional Course Texts and Materials

The following are a set of references, which may also be consulted. It should be emphasized that these references have been listed to enable students to consult a variety of alternative treatments of the subject matter.

- Antonio Cassese, *International Law*, 2nd ed.,UK, Oxford University Press, 2005.
- Malcolm D. Evans (ed.), *Blackstone's International Law Documents*, 9th ed., UK, Oxford University Press, 2009.
- Adam Roberts and Richard Guelff (eds.), *Documents on the Laws of War*, 3rd ed., UK, Oxford University Press, 2000.
-Patricia Birnie, Alan Boyle and Catherine Redgwell, *International Law & the Environment*,3rd ed., UK, Oxford University Press, 2009.

- John Collier and Vaughan Lowe, *The Settlement of Disputes in International Law: Institutions and Procedures*, UK, Oxford University Press, 2000.
- James Crawford, *The International Law Commission's Articles on State Responsibility: Introduction, Text and Commentaries*, UK, Cambridge University Press, 2002.
-Helen Duffy, *The "War on Terror" and the Framework of International Law*, UK, Cambridge University Press, 2005.
- Lori F. Damrosch, Louis Henkin, Richard Pugh, Oscar Schachter and Hans Smit, *International Law: Cases and Materials*, Fourth Ed., West Publishing Co., US, 2001.

Journals:

-The International Journal of Marine and Coastal Law
- Arbitration International
-Information Law and Technology
-Netherlands International Law Review

Assignments and Grading Scheme

Students will receive a series of numerical grades throughout the semester. At the end of the semester the grand total of the number grades will be converted into a letter grade according to the university grading system as posted in the catalogue.

Grades are based on the following:

Writing Assignments	10%
Final Exam	40%
Term paper	40%
Class attendance	5%
Class participation	5%
Total Points	**100%**

Each student is supposed to write a paper, approximately 25 to 30 pages in length, related to the course material. You must submit a two-page summary of the topic that you have chosen for the paper along with a list of references that will be featured in your paper no later than April 7th. The completed paper is due on May, 11. The paper must be typed and double spaced. Plagiarism will not be tolerated under any circumstances, and will lead to an "F" for their papers. The term paper will be graded according to its organization, quality of thinking, originality, use of the English language, number of references, length,

Course Policies

Assessment Description:

- Class Participation: includes discussing instructor's presentations, assigned readings, exercises, and case studies etc. that are apt to make the course more enjoyable for both the students and the instructor. Students are expected to read the assigned material and come to class fully prepared to participate in the discussion of the material assigned for that day. Active participation and contribution is expected from each student, noting that discussion of a given subject matter is one of the most effective methods of learning. Since class participation plays a role in the final grade, it is essential that students do not only read the assignments but properly comprehend the material.

- Attendance: Students are expected to attend all classes. Absence, excused or not, does not absolve a student from the responsibility for the work done or for any announcement made during his/her absence. The maximum absences allowed are according to university policy 6 hrs of class work (6 MWF session or 4 TTh sessions).

- Group/Individual Project: Research and fact-finding assignments, which constitute an integral part of the course, are designed to allow the student to apply course concepts, learn how to interact within the group and others, and understand the challenges of working in a competitive and changing environment. The assigned projects shall be conducted either individually or in groups. The Group/Individual Project shall be submitted in soft copy, and hard copy on A4 paper, font 12 Times New Roman, double spacing.

- Class Presentation: Students are required to make specific Class Presentations as will be assigned by the Course Instructor.

Paper:

Term Paper: Each student is supposed to write a paper, approximately 20 to 30 pages in length, related to the course material. You must submit a two-page summary of the topic that you have chosen for the paper along with a list of references that will be featured in your paper no later than March, 9. The completed paper is due on May , 30. The paper must be typed and double spaced. Plagiarism will not be tolerated under any circumstances, and will lead to an "F" for their papers.
The term paper will be graded according to its organization, quality of thinking, originality, use of the English language, number of references, length,...
Exams: All exams will be closed book and closed notes. The exam will cover material from lectures, assigned readings, and issues discussed in class. No makeup or early exam will be given, except in very exceptional circumstances. The exams will be designed in a way to assess the students' knowledge and absorption of the course material covered in the assigned readings and instructor's presentations.

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines
1	24 Feb	**Introduction** - The Nature and Sources of International Law - Development of Law Among Nations

		- Relationship Between International Law and Municipal Law *Von Glahn, Ch. 1,2,3*
2	02 Mar	**The Community of Nations** State credibility Case Study *Vohn Glahn, Ch. 4*
3	09 Mar	**Recognition of Sates and Governments** *Von Glahn, Ch.5*
4	16 Mar	**State Succession** **Rights of International legal Persons** *Von Glahn, Ch. 6,7*
5	23 Mar	**Duties of States** Respect of environmental treaties Obligations to abide by treaties fighting air, marine pollution, nuclear testing, and hazardous waste *Von Glahn, Ch. 8*
Test 1		
6	30 Mar	**Jurisdiction Over Persons** **Individuals under State Law** **Extradition** *Von Glahn, Ch. 9, 10,12*
7	20 Apr	**International Criminal Law** Case studies: The International Criminal Court: The Special Court for Lebanon

		Von Glahn, Ch. 11
8	27 Apr	**Title to Territory** *Von Glahn Ch. 14, 15*
9	4 May	**Agents of International Intercourse** *Von Glahn, Ch. 16*
10	11 May	**Law of the Sea** Exclusive economic zones, conservation zones, *Vohn Glahn, Ch. 15* **Papers due date**
Test 2		
11	18 May	**International Agreements** *Vohn Glahn, Ch. 17*
12	25 May	**Peaceful Settlement of Disputes** *Vohn Glahn, Ch. 18*
13	01 Jun	**The Use of Force** **Modern War, Commencement Effects, Termination** Vohn Glahn, Ch. 20, 23
14	13 Jun	**Laws of War** *Vohn Glahn Ch. 22*
15	20 Jun	**War Crimes** Conclusion *Vohn Glahn Ch. 26*
Final Exam		

Course	
Module 1	What is the Scope of Public International Law?
Key Concepts	Understanding of the basic concepts of Public International Law
Overview	Under globalization public international law is a key element in shaping international policies. Its impact on states is critical. Questions to be addressed in this module include the following: What is Public international law? What does it encompass? Why is it important to meld the theory and practice? What are the major classifications of theories in the field?
Aim	The overriding aim of this module is to turn students able to discourse on public international law foundations, areas, and volume.
Learning Outcomes	At the end of this module learners will be able to: • Identify the different elements of public international law

	• Discuss how public international law can contribute to sustainable development preserving resources for future generations?
Units	Unit 1.1 Public International evolution since the nineties Unit 1.2: The trends in Public International Law Unit 1.3: The UN Charter Unit 1.4: The current Context of public international law within globalization
Readings	-Von Glahn Ch1-3

Activity	**Overview** *Assignment 1 : Reflecting Upon current trends in public international law* 1. What are the major theories related to public international law especially in relation to the state role? 2. Which ones promote sustainability? To which extend they are successful? 3. What is the role of the state in todays world? *Assignment 2: Applying Theory* 6. Which theory are you most attracted to? Why?

	7. What challenges are faced with in applying your chosen theory on different states especially when it comes to sustainable development?
Module 2	The environment of international trade
Key Concepts	UN, statehood, sovereignty, diplomacy
Overview	The current shift in public international law has been promoted since the beginning of the nineties. It is giving a growing role to human rights, governance, democracy through advocacy and the reduction of state sovereignty.
Aim	The aim of this module is to enhance the understanding of the role of the international community in a context of globalization
Learning Outcomes	At the end of this module learners will be able to: -Identify the foundations of public international law -Understand the growing role of international and regional organizations at the expense of the state role
Units	Unit 2.1: Clarifying the concept of international law

	Unit 2.2: The role of international organizations Unit 2.3: The role of regional organizations
Readings	Von Glahn, Ch. 4-6
Activity	**Overview**
	A detailed research on the evolution of Public International Law since the nineties
Module 3	Public International Law and its impact on ESD
Key Concepts	Law of the sea, law of the air, environmental treaties, protected zones
Overview	The major principles of public international law are based on state sovereignty, state commitment through treaties, and their obligations to act peacefully
Aim	Awareness about the issues enhancing ESD
Learning Outcomes	At the end of this module learners will be able to: Demonstrate knowledge of public international law impact on sustainability
Units	Unit 3.1: Major principles of public international law related to sustainability *Unit 3.2: Their implementation* Unit 3.3:Their impact on sustainable development
Readings	Von Glahn Ch 9-15
Activity	**Overview**
	Assignment 1: Generating Themes **56. Consider one of the indicated themes of this module.**

	57. Next explain the modalities of its implementation **58. Explain which impact it has en SD?** **59. Next consider whether this theme is important at the national and local level of your country**
Module 4	**Approaches to SD infusion in public international law**
Key Concepts	**Advocacy, empowerment, capacity building, international lobbying**
Overview	**In our times, many states are suffering from inappropriate development, inequality, pollution, and economic crisis. Those countries are looking for means to restore their economies while under looking SD. Thus, there is a need to improve advocacy to advance SD in public international law.**
Aim	**The aim of this module is first to explore the potentialities for SD advocacy, empowerment and capacity building at the international level.**
Learning Outcomes	**At the end of this module learners will be able to develop an advocacy action plan preserving resources for future generations**
Units	**Unit 3.1: Setting advocacy principles** **Unit 3.2: Developing advocacy choices** **Unit 3.3: Doing research** **Unit 3.4: Writing a proposal**
Readings	**- Prasard Monica, (2008), The Politics of Free Markets: The Rise of Neoliberal Economic Politics in Britain, Germany, and the US, University of Chicago Press.** **- John H. Jackson and Al., (2002), Legal Problems of International economic Relations,**

	U.S.A., west Group, 4th edition.
Activity	**Overview** **Prepare a research advocacy proposal** ***Assignments: Generating Themes*** **1. Consider one of the indicated themes of this module.** **2. Next explain the modalities of its implementation** **3. Explain which impact it has en SD?** **4. Next consider whether this theme is important at the national and local level of your country**

Module 5	Advocacy in public international law
Key Concepts	ESD , treaties, public choices, development
Overview	There is a need for setting a strategy aimed at convincing international and regional trade organizations to adopt plans for SD with specific choices. This final project shall be disseminated at the global level to create awareness and promote action plans for SD promotion at both national and local levels.
Aim	The overriding aim of this module is to equip students with the capacity to act for SD implementation in cooperation with international advocacy groups.
Learning Outcomes	At the end of this module learners will be able to: Set an SD strategy in public international law Work with others in groups

	Be active members in society
Units	Unit 5.1: Drafting the strategy Unit 5.2: Work for its implementation Unit. 5.3: Lobbying national and international decisions makers and civil society for its implementation
Readings	Von Glahn Ch 18-23
Activity	Overview
	Prepare the working plan and up load it on Y tube

TEMPUS CLIMASP COURSE SYLLABUS TEMPLATE

Course Syllabus

International Business transactions

INL 624

Notre Dame University, Faculty of Law and Political Science,
FALL Semester, 2014-2015

Instructor Information

Instructor: Dr. Georges Labaki
Office Location: Zouk Campus
Telephone: Office – 09 218 950 Ext: 2464
Office Hours: F 4-5PM
E-mail: glabaki@ndu.edu.lb
Website:

Course Identification

Course Number: INL 626
Course Name: International Trade Law
Course Location: University Campus
Class Times: F, 5-8 PM
Prerequisites:
Faculty Web Page:

Course Description/Overview

Course Learning Objectives

The study of international legal practices relating to characteristic forms of international transactions, including the international sale of goods (various forms of commercial terms, insurance, letter of credit, joint-ventures, contracts of sales. Other topics include: the United Nations Convention for the International Sale of Goods, technology transfer contracts, Foreign Direct Investment contracts, and mergers and acquisitions…

Highly interactive, the objectives for the International Business Transactions Course are:

1- To allow students to have a basic understanding of international business transaction and to show how firms do business.

2. To provide ample opportunities for relating theories to realities of everyday life through numerous case studies.

3- To be able to allow the assess the impact of international trade on natural resources, the environment, and developing countries.

4-To be able to create or to be a member of advocacy groups involved in the development of fair trade.

5-To be able to assess and write policy papers intended to encourage climate protection in international trade.

6- Provide students with understanding of legal and contractual issues arising out of various kinds of international commercial transactions and contracts;

7- Develop students' practical problem-solving skills through numerous case studies. Preparing students to acquire the ability to participate in real-life negotiations of international commercial transactions.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

By the end of this course students will be able to:

10- To understand key concepts in international business transactions.
11- To explain the significance and implications of international trade on nations and people.
12- To identify the major issues related to international business transactions.
13- To explain the major rule of international business transaction, its scope, significance, components, theoretical bases and its many changing patterns.
5- To find alternative ways of international business transactions focusing on climate change challenges and preservation of natural resources.
6-To be able to write policy papers and work with groups advocating for fair trade and for a better sharing of resources.

Course Resources

Required Course Texts and Materials

Required Text books :

-Bohlman, M Herbert,(2013)
The Legal, Ethical and International Environment Of Business,
Fifth Edition
Cincinati, West Legal Studies.

-Agusti Earle Shaffer, (2012)
International Business Law and Its Environment, Fifth Edition
Cincinnati, West Legal Studies.

-Additional Readings will be required on weekly basis.

Other Readings:

- John H. Jackson and Al., (2002),
Legal Problems of International economic Relations,
U.S.A., west Group, 4th edition.

– John h. Jackson, (2002)
Documents Supplement to Legal Problems of International ,
Economic Relations
U.S.A., West Group, 2002.

- Petr Van den Bossche, (Latest edition),
The Law and Policy of the World Trade Organization,
U.S.A., Harper Collins Publishers, 1991.

- Hoeber, R. Et. Al., (1982),
Contemporary Business Law, Second Edition.
New York, Mc graw-Hill Book Company

5) Annual Reports of the World Trade Organization.

Wwebsites

WTO- www.wto.org/english/doc e/legale/legal e.htm

- NAFTA: www.worldtrade.net/nafta/index.htm

- Copies of assigned cases are available at: www. worldtradelaw.net

Readings must be done prior to the class session listed in the distribution of readings. Readings will be part of the exam.

Readings must be done prior to the class session listed in the distribution of readings. Readings will be part of the exam.

Grading Scheme

BREAKDOWN		
#	TOPIC	% of Final Grade
1	Attendance & Class Participation	10%

2	Group/Individual Project & Class Presentation	40%
3	Paper	20%
4	Final Exam	30%
Total		100%

Assessment Description:

- Class Participation: includes discussing instructor's presentations, assigned readings, exercises, and case studies etc. that are apt to make the course more enjoyable for both the students and the instructor. Students are expected to read the assigned material and come to class fully prepared to participate in the discussion of the material assigned for that day. Active participation and contribution is expected from each student, noting that discussion of a given subject matter is one of the most effective methods of learning. Since class participation plays a role in the final grade, it is essential that students do not only read the assignments but properly comprehend the material.

- Attendance: Students are expected to attend all classes. Absence, excused or not, does not absolve a student from the responsibility for the work done or for any announcement made during his/her absence. The maximum absences allowed are according to university policy 6 hrs of class work (6 MWF session or 4 TTh sessions).

- Group/Individual Project: Research and fact-finding assignments, which constitute an integral part of the course, are designed to allow the student to apply course concepts, learn how to interact within the group and others, and understand the challenges of working in a competitive and changing environment. The assigned projects shall be conducted either individually or in groups. The Group/Individual Project shall be submitted in soft copy, and hard copy on A4 paper, font 12 Times New Roman, double spacing.

- Class Presentation: Students are required to make specific Class Presentations as will be assigned by the Course Instructor.

Paper:

Term Paper: Each student is supposed to write a paper, approximately 20 to 30 pages in length, related to the course material. You must submit a two-page summary of the topic that you have chosen for the paper along with a list of references that will be featured in your paper no later than November 9. The completed paper is due on December , 30. The paper must be typed and double spaced. Plagiarism will not be tolerated under any circumstances, and will lead to an "F" for their papers.

The term paper will be graded according to its organization, quality of thinking, originality, use of the English language, number of references, length,...

- Exams: All exams will be closed book and closed notes. The exam will cover material from lectures, assigned readings, and issues discussed in class. No makeup or early exam will be given, except in very exceptional circumstances. The exams will be designed in a way to assess the students' knowledge and absorption of the course material covered in the assigned readings and instructor's presentations.

Course Schedule

SYLLABUS

Session 1 &2

Introduction

Contract Basis

Contract Formation

Common Law Countries

Civil law Countries

Importance of environment protection

Impact of climate change on business

Sessions 3 & 4

The Pre-contractual Process

Confidentiality Agreements

Letters of Intent

Enforceability of Preliminary Agreements

Pre-contractual Liability

Climate change issues

Session 5

Drafting of Contracts- Acquisition Agreements Stock vs. Asset Transactions
Representations and Warranties
Covenants
Conditions to Closing
Indemnities
Impact assessment of climate change on the contract

Session 5&6

Negotiating International Commercial Contract

Basics of a Successful Negotiation
Forms of Negotiations: Contest vs. Consensus
Principled Negotiation
The Importance of Process and Culture
Language
Breach of Contract
Articles related to climate change

Session 7

Case Study: Sale of US Turbine Equipment to China

Session 8&9

Joint Ventures, Distribution, Agency and licensing agreements

Structuring International Commercial Relationships

Key Provisions in Formation Agreements
Provisions related to climate change

Session 10

Arbitration
Choice of Law and Forum
Dispute Resolution
Bribery, Fraud and Corruption

Session 11&12

Forms of Corporate merger

Planning and Strategic Issues

Organizing Merger and Acquisition

Timing

Impact assessment on climate change

Session 13&14

Legal Structuring

Anti trust Guidelines

Session 15

Merger Types and Characteristics

Importance of issues related to climate change

Case Studies of Restructuring and M&A Activity

Conclusion

Course	**International Business Transactions**
Module 1	What is the Scope of International Business Trnsactions?
Key Concepts	Understanding of the basic concepts of international business transactions
Overview	Under globalization international business transactions are a key element in shaping domestic policies. Its impact on citizens is critical for employments opportunities are more depending on international competition. Questions to be addressed in this module include the following: What are international business transactions? What does it encompass? Why is it important to meld the theory and practice? What are the major classifications of theories in the field? How has financial crisis been a catalyst for policy change?
Aim	The overriding aim of this module is to turn students able to discourse on international business transactions foundations, areas, and volume.
Learning Outcomes	At the end of this module learners will be able to: • Identify the different elements of international business transactions • Discuss how international can contribute to sustainable development and climate protection preserving resources for future generations?
Units	Unit 1.1 International business transactions evolution since the nineties Unit 1.2: International trade legal structure

	Unit 1.3: The WTO Unit 1.4: The current Context international business transactions
Readings	-Bohlman, M Herbert,(2002) The Legal, Ethical and International Environment Of Business, Fifth Edition Cincinati, West Legal Studies. -Agusti Earle Shaffer, (2002) International Business Law and Its Environment, Fifth Edition Cincinnati, West Legal Studies.
Activity	**Overview** *Assignment 1 : Reflecting Upon current trends in international trade law* 1. What are the major theories related to international business transactions especially in relation to the state role? 2. Which ones promote climate protection? To which extend they are successful?

	Assignment 2: Applying Theory 8. Which theory are you most attracted to? Why? 9. What challenges are faced with in applying your chosen theory on trade in Lebanon especially when it comes to climate protection?
Module 2	The environment of international business transactions
Key Concepts	WTO, free trade areas, competition, opening of boundaries to trade
Overview	The current international trade system has been promoted the beginning of the nineties. It is based on the principle on international and regional economic integration through the creation of free trade areas, deregulation, and the dismantling of technical and non-technical barriers to trade.
Aim	The aim of this module is to enhance the understanding of the role of markets in international business transactions in a context of globalization
Learning Outcomes	At the end of this module learners will be able to: -Identify the foundations of international business international transactions

	-Understand the growing role of international and regional organizations at the expense of the state role in the economy
Units	Unit 2.1: Clarifying the concept of international business transactions Unit 2.2: The role of international organizations Unit 2.3: The role of regional organizations
Readings	-John H. Jackson and Al., (2002), Legal Problems of International economic Relations, U.S.A., west Group, 4th edition. – John h. Jackson, (2002) Documents Supplement to Legal Problems of International , Economic Relations U.S.A., West Group, 2002.
Activity	**Overview**
	A detailed research on international and regional role of organizations in international business transactions
Module 3	International business transactions principals and their impact on climate change
Key Concepts	Free trade, subsidies, technical barriers to trade, standards, most favoured nation rules, elimination of quotas
Overview	The major principles of international business transactions are:

	International contracting, merger and acquisition, negotiations of international contracts, Most favoured nation rules, Joint venture, licensing, choice of law and forum, arbitration..
Aim	Awareness about current taxes and future taxes enhancing climate protection
Learning Outcomes	At the end of this module learners will be able to: Demonstrate knowledge on the principles of the basic principles of international business transactions and their impact on climate change
Units	Unit 3.1: Major principles of international business transactions Unit 3.2: Their implementation Unit 3.3:Their impact on climate change
Readings	-Folsom, H Ralph, (2001) International Trade and Investment, Second Edition USA, West Group. - John H. Jackson and Al., (2002), Legal Problems of International economic Relations, U.S.A., west Group, 4th edition. – John h. Jackson, (2002) Documents Supplement to Legal Problems of International , Economic Relations U.S.A., West Group, 2002.
Activity	**Overview**

	Assignment 1: Generating Themes 60. Consider one of the indicated themes of this module. 61. Next explain the modalities of its implementation 62. Explain which impact it has on climate change? 63. Next consider whether this theme is important at the national and local level of your country
Module 4	Approaches to climate change protection infusion in international business transactions
Key Concepts	Advocacy, empowerment, capacity building, international lobbying
Overview	In our times, the majority of states are suffering from severe financial crisis due to lack of competitively. Those countries are looking for means to restore their economies while under looking climate change. Thus, there is a need to improve advocacy to advance climate protection in international trade
Aim	The aim of this module is first to explore the potentialities for climate change advocacy, empowerment and capacity building at the international level.
Learning Outcomes	At the end of this module learners will be able to develop an advocacy action plan preserving resources for future generations
Units	Unit 3.1: Setting advocacy principles Unit 3.2: Developing advocacy choices Unit 3.3: Doing research Unit 3.4: Writing a proposal
Readings	- Prasard Monica, (2008), The Politics of Free Markets: The Rise of Neoliberal Economic Politics in Britain, Germany, and the US, University of

	Chicago Press. - John H. Jackson and Al., (2002), Legal Problems of International economic Relations, U.S.A., west Group, 4th edition.
Activity	**Overview**
	Prepare a research advocacy proposal
Module 5	Advocacy in international trade
Key Concepts	ESD , taxes, public choices, development
Overview	There is a need for setting a strategy aimed at convincing international and regional trade organizations to adopt plans for climate change protection with specific choices. This final project shall be disseminated at the global level to create awareness and promote action plans for climate change protection promotion at both national and local levels.
Aim	The overriding aim of this module is to equip students with the capacity to act for climate change protection plans implementation in cooperation with international advocacy groups.
Learning Outcomes	At the end of this module learners will be able to: Set an SD strategy in international business transactions Work with others in groups Be active members in society
Units	Unit 5.1: Drafting the strategy Unit 5.2: Work for its implementation

Readings	- Hoeber, R. Et. Al., (1982), Contemporary Business Law, Second Edition. New York, Mc graw-Hill Book Company -Annual Reports of the World Trade Organization.
Activity	**Overview**
	Prepare the working plan and up load it on the Internet

Course Syllabus

BAD 429

Operations Management, Sustainability and Supply Chain Management

Notre Dame University-Louaize
Faculty of Business Administration and Economics

Fall 2014

Instructor Information

Instructor:	Dr. Atef H. Harb
Office Location:	Faculty of Business Administration and Economics
Telephone:	09-208308
Office Hours:	MW T TH 8-9 AM
E-mail:	aharb@ndu.edu.lb
Website:	www.ndu.edu.lb

Course Identification

Course Number:	**BAD 429**
Course Name:	**Operations Management**
Course Location:	University Campus
Class Times:	MWF 9:00-10:00 am
Prerequisites:	Senior Standing
Faculty Web Page:	http://www.ndu.edu.lb

Course Description/Overview

This course introduces the concepts, techniques and methodologies of modern operations, production management, sustainability and business decision making using quantitative analysis. The subjects spans from forecasting to production scheduling, from facility location and layout, from Sustainability and supply chain Management to staffing. It aims at providing modern time managers the necessary tools for rational and objective decisions in contemporary competitive and highly demanding business environments.

Students will be asked to visit some Lebanese industries in order to apply the different theories and techniques of Production and Operations Management.

Case studies are essential to the teaching of practical and applied subjects such as Operations Management. To make life easier for students, I have gathered a collection of case studies covering a wide variety of Operations Management issues in many different settings. The aim of these cases is to promote discussion as to how operations managers might improve their operations and contribute to corporate objectives, and by so doing equip future and practicing managers with the skills and techniques needed to be better able to understand and manage operations. So, using case studies will help students develop a range of different skills.

Video Clips: Approximately 30 Video Clips (3 hours) will be presented in class, first, to provide some insight into a particular operations concept, second, to take students on site to a real plant or operations; and, third to hear from real managers and operators of the critical importance of operations concepts to business today and to learn about the relation between operations Management and Sustainability.

A computer package in applied management science (WINQSB and OMS) will be used and applied to the different topics/chapters of this course. Professional guest speakers might be invited to the course to share knowledge and experience.

After completing this course students should be able to:

- Discuss the subject of operations management using convincing arguments supporting specific ideas through weekly presentations.
- Learn the purpose and need of operations management and the role of operations managers
- Appreciate topics related to production and operations management such as logistics and supply chain management, change management, e-procurement and product design
- Detect the potential of high-tech and IT for future development and the development of the 'information society'.
- Improve critical thinking to the strategic cultural, legal and ethical issues facing business organizations in their daily use of the 10-operations management decisions.
- Analyze how best an organization can make strategic use of the facilities provided by the operations management concept and international standards in order to achieve its goals.
- Gain practice in communicating ideas and concepts in written/oral forms.

PS. Matrix outlining the relationship between ILOs and Program's Goals and Outcomes are included in the Course Notebook.

Learning Strategies and contents of the course

- Highly interactive course.
- Pin-up involving students' presentations and group discussion and evaluation.
- Understanding of given handouts, and enhance interpretation and reasoning abilities.
- Reports on Readings and Cases.
- It also relies on weekly lectures by the professor; the students will then be required to contribute to discussions based on readings, give presentations to the class on a regular basis and discuss their findings within small groups as well as whole class discussions.

Duration: one semester of 15 weeks and 45 hours.

The course consists of several topics given over 45 hours of face-to-face lectures/problem solving. The learning hours are subdivided as follows:

Contact hours (including phase-tests assessment)	45
Directed readings and preparation	30
Final case and further private study and exam preparation	105
Total	**180 hrs**

Course Resources

Required Text Book/s

- Jay Heizer and Barry Render: Operations Management, Sustainability and Supply Chain Management, 11TH Edition (Global Edition). Prentice Hall, 2014. **(Mandatory)**
- Handout, 2013, Prepared by Dr. Atef H. Harb**.**

Recommended Readings/other Readings:

- Operations Management: focusing on quality and competitiveness, Russel and Taylor, 2nd Edition and 3rd Edition, 1998 and 2000.
- Operations Management, Reid and Sanders, 2002. John Wiley and Sons
- Production and Operations Management, An Applied Modern approach, J.S. Martinich, 1999, John Wiley and Sons.
- Production and Operations Management, Shuka, P.K., 229 pages, McGraw-Hill, 2000.
- Practical Operations Management, Hayes, Mike, 249 pages, Philip Allan, 1988.
- Project Management: a Managerial Approach, J. R. Meredith and Samuel J. Mantel, Jr., 2005.
- Journal of Operations Management: issues from December 2005- December 2007), Washington, D.C.: American Production and Inventory Control Society.
- Production and Operations Management concepts, Models, and Behavior, Everett E. Adam and Ronald J. Ebert, Prentice Hall, 1986.
- Operations Management: Strategy and Analysis. Lee J. K. and Larry P. R., 4th edition, Reading, Mass.: Addison-Wesley, 1996.
- Quantitative Methods for Decision Makers, Third Edition, Prentice Hall, Mik Wisniewski, 2005, Prentice Hall.
- Quantitative Methods for business Decisions with Cases 1988, Lawrence L. Lapin, 5th ed., 1991, NY.
- Operations Research: an introduction, Hamdy A. Taha. 5th edition, 1992, NY., Macmillan.

- Probability and Statistics, Morris H. DeGroot and Mark J. Schervish, 3rd edition, 2006, Addison Wesley.

- Journal of Operations Management, Washington, D.C.: American Production and inventory control society, c2007

Readings must be done prior to the class session listed in the distribution of readings. Readings will be part of the exams.

In addition students are advised to research in the library periodicals. Supplementary reading will be assigned relevant to each assigned schematic and project.

Resources Available to Students

- Library Resources: NDU Library is open to students to help you in all your research and class work. Qualified personnel are available to help you.

- Writing Center: The Writing Center provides assistance to all students who wish to discuss their writing with a trained consultant. The Center is located in HA 114. An appointment is required.

- Blackboard (bb) Software: If you are not familiar with the Blackboard system, it is recommended to attend a training session at the University Computer Services in order to know how to use the Blackboard system to enrich the academic communication with your instructor and your colleagues

- Computer Center For "WINQSB' and "OMS"

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Assignments and Grading Scheme

Evaluation of Attendance & Attitude will be included within each project; i.e. pin-up seriousness, process of project development, presentations, involvement and interaction with classmates, etc.

Assignments	**05%**
Project (Report (15%), Presentation (5%))	**20%**
Cases (Preparation, Presentation and Discussion)	**10%**
Midterm Exam	**30%**
Final Exam (Comprehensive (idea and Concept))	**35%**

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Date	Topics/Description

Week 1	**Introduction**
Week 2	**Chapter 1. Production and Operations Management.** **Case Study**
Week 3	**Chapter 2. Introduction to the software and Operations strategy in a global environment.** **Assignment.** **(Deadline for project proposal)**
Week 4	**Chapter 3. Introduction to Project Management as an Operation Management Decision only (1 hour).** **Chapter 4: Forecasting** **Case /Assignment**
Week 5	**Chapter 5. Product design and operations.** **Assignment**
Week 6	***Chapter 6. Managing Quality.*** ***Case study***
Week 7	**Chapter 7. Capacity planning and facility location.** **Assignment/Case**
Week 8	**Chapter 8. Selecting the process structure and Technology.** **Case study**
Week 9	**MIDTRERM EXAM (CH. 1…5)**
Week 10	**Chapter 10. Human resources and job design.** **Case study**
Week 11	**Chapters 11 and 12. Inventory Management and Supply Chain (Introduction)** **Case study**
Weeks	**Chapter 16. Just in Time (JIT), Lean Production, and the Toyota**

12 and 13	**Production system (TPS). Introduction. Case study** **Deadline to submit the projects (Hard and Soft copies)**
Weeks 14 and 15	**Random selection of teams.** **Presentation of Projects (Random Selection of Teams)**
	Final Exam (From Ch. 6 till the end of the semester)

Course	**Operations Management**
Module 1	Introduction to Operations Management and Sustainability
Module 2	Product Design, Sustainability and International Standards
Module 3	Supply Chain Management, JIT, Maintenance and the Toyota Production System
Module 4	Videos about sustainability at Frito-Lay, Regal Marine. Building Sustainability at the Orlando Magic's Center. Green Manufacturing and sustainability At Frito-lay. Empowerment.

TEMPUS CLIMAX COURSE SYLLABUS TEMPLATE

Course Syllabus

PUBLIC INTERNATIONAL LAW
IAF 401
Notre Dame University, Faculty of Political Science, Public Administration and Diplomacy
SPRING Semester, 2012-2013

Instructor Information

Instructor:	Dr. Georges Labaki
Office Location:	B 266 The Green Building
Telephone:	09 218 950 Ext: 2464
Office Hours:	M 12:00-1:00 PM
E-mail:	glabaki@ndu.edu.lb
Website:	ndu.edu.lb

Course Identification

Course Number:	IAF 401
Course Name:	PUBLIC INTERNATIONAL LAW
Course Location:	HA 303
Class Times:	MWF 11-12:00
Prerequisites:	N/A

Faculty Web Page: http://www.ndu.edu.lb/academics/fpspad/intro.htm

Course Description/Overview

Course Objectives: A study of the sources and development of international law, with special emphasis given to current trends and problems. A critical evaluation of contemporary problems of world order is provided, covering legal issues, war, and economic development.

Topics include: the role of the state in the current international legal system, treaties, peaceful solutions of problems, the preservation of natural resources, the law of the sea, the law of war, ethics, and state credibility in the international system.

Course Learning Objectives

This course aims at providing the following learning objectives:

-Identify the sources, principles, concepts and law-making procedures which underpin the international legal system;

-Understand the international environmental law negotiation process;

-Examine and interpret the content of environmental l laws treaties.

-Differentiate the role of main actors involved in the development of international environmental law;

-The understanding of major legal challenges faced by the international community today.

- To examine and evaluate the practical application of international law and its response to contemporary international issues.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

Learning Outcome 1
Demonstrate a good knowledge of the nature of the basic institutional structure of international society and of the nature of Statehood;

Learning Outcome 2
Explain how international law is made and the relationship between international law and municipal law;

Learning Outcome 3

Demonstrate an awareness of the political, social, economic and other factors that affect international law-making processes;

Learning Outcome 4
Demonstrate the ability to explain how the rules of public international law would apply to a particular case and to critically examine questions about a substantive area of international law.

Learning Outcome 5
To be able to analyze and critically evaluate the principles, sources and vocabulary of international law, and to use the special terminology of international law

Learning Outcome 6

Demonstrate, when discussing and writing about any particular rule of international an ability to say whether the rule in question derives from a treaty or custom;

Course Resources

Course Website(s)

This course is based on Blackboard.

On line resources:

-www. Law.ox.ac.uk/PIL/
-www. Worldlii.org/catalog/169.html
-www. Catalaw.com/topics/PublicInternational.shtml

Required Course Texts and Materials

GLAHN Von Gerhard: Law Among Nations, An Introduction to Public International Law, Latest Edition, New York, Macmillan Publishing Company, 2010.

Optional Course Texts and Materials

The following are a set of references, which may also be consulted. It should be emphasized that these references have been listed to enable students to consult a variety of alternative treatments of the subject matter.

- Antonio Cassese, *International Law*, 2nd ed.,UK, Oxford University Press, 2005.
- Malcolm D. Evans (ed.), *Blackstone's International Law Documents*, 9th ed., UK, Oxford University Press, 2009.
- Adam Roberts and Richard Guelff (eds.), *Documents on the Laws of War*, 3rd ed., UK, Oxford University Press, 2000.
-Patricia Birnie, Alan Boyle and Catherine Redgwell, *International Law & the Environment*,3rd ed., UK, Oxford University Press, 2009.
- John Collier and Vaughan Lowe, *The Settlement of Disputes in International Law: Institutions and Procedures*, UK, Oxford University Press, 2000.
- James Crawford, *The International Law Commission's Articles on State Responsibility: Introduction, Text and Commentaries*, UK, Cambridge University Press, 2002.
-Helen Duffy, *The "War on Terror" and the Framework of International Law*, UK, Cambridge University Press, 2005.
- Lori F. Damrosch, Louis Henkin, Richard Pugh, Oscar Schachter and Hans Smit, *International Law: Cases and Materials*, Fourth Ed., West Publishing Co., US, 2001.

Journals:

-The International Journal of Marine and Coastal Law
- Arbitration International
-Information Law and Technology
-Netherlands International Law Review

Assignments and Grading Scheme

Students will receive a series of numerical grades throughout the semester. At the end of the semester the grand total of the number grades will be converted into a letter grade according to the university grading system as posted in the catalogue.

Grades are based on the following:

Writing Assignments	10%
Final Exam	40%
Term paper	40%
Class attendance	5%
Class participation	5%
Total Points	**100%**

Each student is supposed to write a paper, approximately 25 to 30 pages in length, related to the course material. You must submit a two-page summary of the topic that you have chosen for the paper along with a list of references that will be featured in your paper no later than April 7th. The completed paper is due on May, 11. The paper must be typed and double spaced. Plagiarism will not be tolerated under any circumstances, and will lead to an "F" for their papers. The term paper will be graded according to its organization, quality of thinking, originality, use of the English language, number of references, length,

Course Policies

Assessment Description:

- Class Participation: includes discussing instructor's presentations, assigned readings, exercises, and case studies etc. that are apt to make the course more enjoyable for both the students and the instructor. Students are expected to read the assigned material and come to class fully prepared to participate in the discussion of the material assigned for that day. Active participation and contribution is expected from each student, noting that discussion of a given subject matter is one of the most effective methods of learning. Since class participation plays a role in the final grade, it is essential that students do not only read the assignments but properly comprehend the material.

- Attendance: Students are expected to attend all classes. Absence, excused or not, does not absolve a student from the responsibility for the work done or for any announcement made during his/her absence. The maximum absences allowed are according to university policy 6 hrs of class work (6 MWF session or 4 TTh sessions).

- Group/Individual Project: Research and fact-finding assignments, which constitute an integral part of the course, are designed to allow the student to apply course concepts, learn how to interact within the group and others, and understand the challenges of working in a competitive and changing environment. The assigned projects shall be conducted either individually or in groups. The Group/Individual Project shall be submitted in soft copy, and hard copy on A4 paper, font 12 Times New Roman, double spacing.

- Class Presentation: Students are required to make specific Class Presentations as will be assigned by the Course Instructor.

Paper:

Term Paper: Each student is supposed to write a paper, approximately 20 to 30 pages in length, related to the course material. You must submit a two-page summary of the topic that you have chosen for the paper along with a list of references that will be featured in your paper no later than March, 9. The completed paper is due on May , 30. The paper must be typed and double spaced. Plagiarism will not be tolerated under any circumstances, and will lead to an "F" for their papers.
The term paper will be graded according to its organization, quality of thinking, originality, use of the English language, number of references, length,...
Exams: All exams will be closed book and closed notes. The exam will cover material from lectures, assigned readings, and issues discussed in class. No makeup or early exam will be given, except in very exceptional circumstances. The exams will be designed in a way to assess the students' knowledge and absorption of the course material covered in the assigned readings and instructor's presentations.

Course Schedule

Week	Date	Topics, Reading, Assignments and Deadlines
1	24 Feb	**Introduction** - The Nature and Sources of International Law - Development of Law Among Nations

		- Relationship Between International Law and Municipal Law *Von Glahn, Ch. 1,2,3*
2	02 Mar	**The Community of Nations** State credibility Case Study *Vohn Glahn, Ch. 4*
3	09 Mar	**Recognition of Sates and Governments** *Von Glahn, Ch.5*
4	16 Mar	**State Succession** **Rights of International legal Persons** *Von Glahn, Ch. 6,7*
5	23 Mar	**Duties of States** Respect of environmental treaties Obligations to abide by treaties fighting air, marine pollution, nuclear testing, and hazardous waste *Von Glahn, Ch. 8*
Test 1		
6	30 Mar	**Jurisdiction Over Persons** **Individuals under State Law** **Extradition** *Von Glahn, Ch. 9, 10,12*
7	20 Apr	**International Criminal Law** Case studies: The International Criminal Court: The Special Court for Lebanon

		Von Glahn, Ch. 11
8	27 Apr	**Title to Territory** *Von Glahn Ch. 14, 15*
9	4 May	**Agents of International Intercourse** *Von Glahn, Ch. 16*
10	11 May	**Law of the Sea** Exclusive economic zones, conservation zones, *Vohn Glahn, Ch. 15* **Papers due date**
Test 2		
11	18 May	**International Agreements** *Vohn Glahn, Ch. 17*
12	25 May	**Peaceful Settlement of Disputes** *Vohn Glahn, Ch. 18*
13	01 Jun	**The Use of Force** **Modern War, Commencement Effects, Termination** Vohn Glahn, Ch. 20, 23
14	13 Jun	**Laws of War** *Vohn Glahn Ch. 22*
15	20 Jun	**War Crimes** Conclusion *Vohn Glahn Ch. 26*
Final Exam		

Course	
Module 1	What is the Scope of Public International Law?
Key Concepts	Understanding of the basic concepts of Public International Law
Overview	Under globalization public international law is a key element in shaping international policies. Its impact on states is critical. Questions to be addressed in this module include the following: What is Public international law? What does it encompass? Why is it important to meld the theory and practice? What are the major classifications of theories in the field?
Aim	The overriding aim of this module is to turn students able to discourse on public international law foundations, areas, and volume.
Learning Outcomes	At the end of this module learners will be able to: • Identify the different elements of public international law • Discuss how public international law can contribute to sustainable development preserving resources for future generations?
Units	Unit 1.1 Public International evolution since the nineties Unit 1.2: The trends in Public International Law

	Unit 1.3: The UN Charter Unit 1.4: The current Context of public international law within globalization
Readings	-Von Glahn Ch1-3

Activity	**Overview**
	Assignment 1 : Reflecting Upon current trends in public international law 1. What are the major theories related to public international law especially in relation to the state role? 2. Which ones promote sustainability? To which extend they are successful? 3. What is the role of the state in todays world? *Assignment 2: Applying Theory* 10. Which theory are you most attracted to? Why? 11. What challenges are faced with in applying your chosen theory on different states especially when it comes to sustainable development?

Module 2	The environment of international trade
Key Concepts	UN, statehood, sovereignty, diplomacy
Overview	The current shift in public international law has been promoted since the beginning of the nineties. It is giving a growing role to human rights, governance, democracy through advocacy and the reduction of state sovereignty.
Aim	The aim of this module is to enhance the understanding of the role of the international community in a context of globalization
Learning Outcomes	At the end of this module learners will be able to: -Identify the foundations of public international law -Understand the growing role of international and regional organizations at the expense of the state role
Units	Unit 2.1: Clarifying the concept of international law Unit 2.2: The role of international organizations Unit 2.3: The role of regional organizations

Readings	Von Glahn, Ch. 4-6
Activity	**Overview**
	A detailed research on the evolution of Public International Law since the nineties
Module 3	Public International Law and its impact on ESD
Key Concepts	Law of the sea, law of the air, environmental treaties, protected zones
Overview	The major principles of public international law are based on state sovereignty, state commitment through treaties, and their obligations to act peacefully
Aim	Awareness about the issues enhancing ESD
Learning Outcomes	At the end of this module learners will be able to: Demonstrate knowledge of public international law impact on sustainability
Units	Unit 3.1: Major principles of public international law related to sustainability *Unit 3.2: Their implementation* Unit 3.3:Their impact on sustainable development
Readings	Von Glahn Ch 9-15
Activity	**Overview**
	Assignment 1: Generating Themes **64. Consider one of the indicated themes of this module.** **65. Next explain the modalities of its implementation** **66. Explain which impact it has en SD?** **67. Next consider whether this theme is important at the national and local level of your country**

Module 4	**Approaches to SD infusion in public international law**
Key Concepts	**Advocacy, empowerment, capacity building, international lobbying**
Overview	**In our times, many states are suffering from inappropriate development, inequality, pollution, and economic crisis. Those countries are looking for means to restore their economies while under looking SD. Thus, there is a need to improve advocacy to advance SD in public international law.**
Aim	**The aim of this module is first to explore the potentialities for SD advocacy, empowerment and capacity building at the international level.**
Learning Outcomes	**At the end of this module learners will be able to develop an advocacy action plan preserving resources for future generations**
Units	**Unit 3.1: Setting advocacy principles** **Unit 3.2: Developing advocacy choices** **Unit 3.3: Doing research** **Unit 3.4: Writing a proposal**
Readings	**- Prasard Monica, (2008), The Politics of Free Markets: The Rise of Neoliberal Economic Politics in Britain, Germany, and the US, University of Chicago Press.** **- John H. Jackson and Al., (2002), Legal Problems of International economic Relations, U.S.A., west Group, 4th edition.**
Activity	**Overview** **Prepare a research advocacy proposal** ***Assignments: Generating Themes***

	5. **Consider one of the indicated themes of this module.** 6. **Next explain the modalities of its implementation** 7. **Explain which impact it has en SD?** 8. **Next consider whether this theme is important at the national and local level of your country**

Module 5	Advocacy in public international law
Key Concepts	ESD , treaties, public choices, development
Overview	There is a need for setting a strategy aimed at convincing international and regional trade organizations to adopt plans for SD with specific choices. This final project shall be disseminated at the global level to create awareness and promote action plans for SD promotion at both national and local levels.
Aim	The overriding aim of this module is to equip students with the capacity to act for SD implementation in cooperation with international advocacy groups.
Learning Outcomes	At the end of this module learners will be able to: Set an SD strategy in public international law Work with others in groups Be active members in society
Units	Unit 5.1: Drafting the strategy Unit 5.2: Work for its implementation Unit. 5.3: Lobbying national and international decisions makers and civil society for its implementation

Readings	Von Glahn Ch 18-23
Activity	Overview
	Prepare the working plan and up load it on Y tube

Course Syllabus

BAD 429

Operations Management, Sustainability and Supply Chain Management

Notre Dame University-Louaize
Faculty of Business Administration and Economics
Fall 2014

Instructor Information

Instructor: Dr. Atef H. Harb
Office Location: Faculty of Business Administration and Economics

Telephone: 09-208308
Office Hours: MW T TH 8-9 AM
E-mail: aharb@ndu.edu.lb
Website: www.ndu.edu.lb

Course Identification

Course Number: **BAD 429**
Course Name: **Operations Management**
Course Location: University Campus
Class Times: MWF 9:00-10:00 am
Prerequisites: Senior Standing
Faculty Web Page: http://www.ndu.edu.lb

Course Description/Overview

This course introduces the concepts, techniques and methodologies of modern operations, production management, sustainability and business decision making using quantitative analysis. The subjects spans from forecasting to production scheduling, from facility location and layout, from Sustainability and supply chain Management to staffing. It aims at providing modern time managers the necessary tools for rational and objective decisions in contemporary competitive and highly demanding business environments. Students will be asked to visit some Lebanese industries in order to apply the different theories and techniques of Production and Operations Management.

Case studies are essential to the teaching of practical and applied subjects such as Operations Management. To make life easier for students, I have gathered a collection of case studies covering a wide variety of Operations Management issues in many different settings. The aim of these cases is to promote discussion as to how operations managers might improve their operations and contribute

to corporate objectives, and by so doing equip future and practicing managers with the skills and techniques needed to be better able to understand and manage operations. So, using case studies will help students develop a range of different skills.

Video Clips: Approximately 30 Video Clips (3 hours) will be presented in class, first, to provide some insight into a particular operations concept, second, to take students on site to a real plant or operations; and, third to hear from real managers and operators of the critical importance of operations concepts to business today and to learn about the relation between operations Management and Sustainability.

A computer package in applied management science (WINQSB and OMS) will be used and applied to the different topics/chapters of this course. Professional guest speakers might be invited to the course to share knowledge and experience.

After completing this course students should be able to:

- Discuss the subject of operations management using convincing arguments supporting specific ideas through weekly presentations.
- Learn the purpose and need of operations management and the role of operations managers
- Appreciate topics related to production and operations management such as logistics and supply chain management, change management, e-procurement and product design
- Detect the potential of high-tech and IT for future development and the development of the 'information society'.
- Improve critical thinking to the strategic cultural, legal and ethical issues facing business organizations in their daily use of the 10-operations management decisions.
- Analyze how best an organization can make strategic use of the facilities provided by the operations management concept and international standards in order to achieve its goals.
- Gain practice in communicating ideas and concepts in written/oral forms.

PS. Matrix outlining the relationship between ILOs and Program's Goals and Outcomes are included in the Course Notebook.

Learning Strategies and contents of the course

- Highly interactive course.

- Pin-up involving students' presentations and group discussion and evaluation.
- Understanding of given handouts, and enhance interpretation and reasoning abilities.
- Reports on Readings and Cases.
- It also relies on weekly lectures by the professor; the students will then be required to contribute to discussions based on readings, give presentations to the class on a regular basis and discuss their findings within small groups as well as whole class discussions.

Duration: one semester of 15 weeks and 45 hours.

The course consists of several topics given over 45 hours of face-to-face lectures/problem solving. The learning hours are subdivided as follows:

Contact hours (including phase-tests assessment)		45
Directed readings and preparation	30	
Final case and further private study and exam preparation		105
Total	**180 hrs**	

Course Resources

Required Text Book/s

- Jay Heizer and Barry Render: Operations Management, Sustainability and Supply Chain Management, 11TH Edition (Global Edition). Prentice Hall, 2014. **(Mandatory)**
- Handout, 2013, Prepared by Dr. Atef H. Harb**.**

Recommended Readings/other Readings:

- Operations Management: focusing on quality and competitiveness, Russel and Taylor, 2nd Edition and 3rd Edition, 1998 and 2000.

- Operations Management, Reid and Sanders, 2002. John Wiley and Sons
- Production and Operations Management, An Applied Modern approach, J.S. Martinich, 1999, John Wiley and Sons.
- Production and Operations Management, Shuka, P.K., 229 pages, McGraw-Hill, 2000.
- Practical Operations Management, Hayes, Mike, 249 pages, Philip Allan, 1988.
- Project Management: a Managerial Approach, J. R. Meredith and Samuel J. Mantel, Jr., 2005.
- Journal of Operations Management: issues from December 2005- December 2007), Washington, D.C.: American Production and Inventory Control Society.
- Production and Operations Management concepts, Models, and Behavior, Everett E. Adam and Ronald J. Ebert, Prentice Hall, 1986.
- Operations Management: Strategy and Analysis. Lee J. K. and Larry P. R., 4th edition, Reading, Mass.: Addison-Wesley, 1996.
- Quantitative Methods for Decision Makers, Third Edition, Prentice Hall, Mik Wisniewski, 2005, Prentice Hall.
- Quantitative Methods for business Decisions with Cases 1988, Lawrence L. Lapin, 5th ed., 1991, NY.
- Operations Research: an introduction, Hamdy A. Taha. 5th edition, 1992, NY., Macmillan.
- Probability and Statistics, Morris H. DeGroot and Mark J. Schervish, 3rd edition, 2006, Addison Wesley.
- Journal of Operations Management, Washington, D.C.: American Production and inventory control society, c2007

Readings must be done prior to the class session listed in the distribution of readings. Readings will be part of the exams.

In addition students are advised to research in the library periodicals. Supplementary reading will be assigned relevant to each assigned schematic and project.

Resources Available to Students

- Library Resources: NDU Library is open to students to help you in all your research and class work. Qualified personnel are available to help you.

- Writing Center: The Writing Center provides assistance to all students who wish to discuss their writing with a trained consultant. The Center is located in HA 114. An appointment is required.

- Blackboard (bb) Software: If you are not familiar with the Blackboard system, it is recommended to attend a training session at the University Computer Services in order to know how to use the Blackboard system to enrich the academic communication with your instructor and your colleagues

- Computer Center For "WINQSB' and "OMS"

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Assignments and Grading Scheme

Evaluation of Attendance & Attitude will be included within each project; i.e. pin-up seriousness, process of project development, presentations, involvement and interaction with classmates, etc.

Assignments	**05%**
Project (Report (10%), Presentation (5%))	**15%**
Cases (Preparation, Presentation and Discussion)	**10%**
Exam 1	**20%**
Exam 2	**20%**
Final Exam (Comprehensive (idea and Concept))	**30%**

Dissability

Students who have disabilities should have a confidential appointment to discuss their need for accommodations. Establishing reasonable accommodations should be considered on a case-by-case basis.

Important Dates to Remember

Course Schedule

Date	Topics/Description
Week 1	**Introduction**
Week 2	**Chapter 1. Production and Operations Management.** **Case Study**
Week 3	**Chapter 2. Introduction to the software and Operations strategy in a global environment.** **Assignment.** **(Deadline for project proposal)**
Week 4	**Chapter 3. Introduction to Project Management as an Operation Management Decision only (1 hour).** **Chapter 4: Forecasting**

	Case /Assignment
Week 5	**Chapter 5. Product design and operations.** **Assignment**
Week 6	***Chapter 6. Managing Quality.*** ***Case study***
Week 7	**Chapter 7. Capacity planning and facility location.** **Assignment/Case**
Week 8	**Chapter 8. Selecting the process structure and Technology.** **Case study**
Week 9	**MIDTRERM EXAM (CH. 1…5)**
Week 10	**Chapter 10. Human resources and job design.** **Case study**
Week 11	**Chapters 11 and 12. Inventory Management and Supply Chain (Introduction)** **Case study**
Weeks 12 and 13	**Chapter 16. Just in Time (JIT), Lean Production, and the Toyota Production system (TPS). Introduction. Case study** **Deadline to submit the projects (Hard and Soft copies)**
Weeks 14 and 15	**Random selection of teams.** **Presentation of Projects (Random Selection of Teams)**
	Final Exam (From Ch. 6 till the end of the semester)

Course	Operations Management
Module 1	Introduction to Operations Management and Sustainability
	This Module will include the following Topics: **-Operations and productivity** **-The Global Environment and Operations Strategy** **-How to Manage Projects** **-The Forecasting Process** **-Ethics, Social Responsibility and Sustainability. New Challenges In Operations Management.** **Assessment and Evaluation:** **-One Exam** **-2 Cases** **- 4 Assignments** **Book and Articles: Operations Management, Sustainability and Supply Chain Management, Heizer and Render, 2014.** **The International Journal Of Operations Management.** **The Aim of this Module is to introduce the Concept Of Operations Management and how it is linked to Sustainability and Supply Chain Management.**
Module 2	Product Design, Sustainability and International Standards

	In the Second Module, We will Explore The following Topics: **-Product Design and Sustainability** **-Quality Management and International Standards** **- Statistical Process Control** **- Capacity Planning and Layout Decisions** **-Job Design and Work Environment** **Assessment and Evaluation:** **-One Exam** **-One Case Study** **- Different Assignments for different topics** **The Same Material will be used for the Readings, Articles and Cases.** **This Module explores the Ideas of "Designing Operations" including the Quality Management and International Standards**
Module 3	Supply Chain Management, JIT, Maintenance and the Toyota

	Production System
	Topics will cover: **-Supply Chain Management and Modelling** **-Inventory Management** **-Aggregate Scheduling** **-Material Requirements Planning and ERP** **-JIT, Lean Operations, and the Toyota Production System** **-Maintenance and Reliability Decisions** **Assessment and Evaluation:** **One Exam** **One Article (project) linked to the topic of Operations Management and Sustainability.** **This module gives student all the required information to understand the concept of Supply Chain Management and Supply Chain Modelling including Inventory Management, JIT and the Toyota Production system.**
Module 4	Videos about sustainability at Frito-Lay, Regal Marine. Building Sustainability at the Orlando Magic's Center. Green Manufacturing and sustainability At Frito-lay. Empowerment at Hard Rock Cafe.
	3 Hours of Videos linked to Operations Management, Sustainability and Supply Chain Management will be viewed, discussed and analyzed in class. **The Videos will be about American and European Companies.** Approximately 30 Video Clips (3 hours) will be presented in class and in different sessions, first, to provide some insight into a particular operations concept, second, to take students on site to a real plant or

	operations; and, third to hear from real managers, operations Managers and Decision Makers of the critical importance of operations concepts to business today and to learn about the relation between operations Management and Sustainability vis-à-vis the Renewable and non Renewable Resources and Climate Change.

COURSE SYLLABUS

ECN....

Climate Change Economics and Sustainability Policy

Notre Dame University – Louaize Faculty of Business Administration and Economics

Instructor Information

Course Identification

Spring 2014

Instructor: Office Location: Telephone: Office Hours: E-mail:

Dr. Nancy Kanbar Faculty of Business Administration and Economics 09-218950 MWF 4-5 pm

nkanbar@ndu.edu.lb

Course Number: Course Name:

Course Location: Class Times: Prerequisites: Faculty Web Page:

ECN

climate change economics and sustainability policy

FBAE MWF None http://www.ndu.edu.lb

Course Description/Overview

With contemporary economic, demographic, and technological developments around the world, the global environmental repercussions are becoming widespread. This course provides an introduction to the complex world of climate change economics and sustainability policy. It is about the way human decisions affect the quality of the environment; about how human values and institutions shape our demands for quality improvement; and, about how to design effective economic and development policies to bring

about these improvements. Environmental issues are inter-related in complex ways and have important ethical, political, economic, social and technical dimensions. This course will develop in students an in-depth understanding of climate change economics and sustainability policy. It covers topics in climate change economics, with a focus on the sustainability of human-economic activities and their impact on the natural environment.

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Course Learning Objectives

The overarching goals of this course are: a) to provide a critical approach to climate change economics;

b) to assess climate change in the context of sustainability;

c) to examine the process through which international environmental policies are made;

d) to discuss the scientific controversies related to estimating the human and environmental impacts of climate change and the policy options available for addressing these impacts;

e) to use essential tools of environmental economic /policy analysis, including the assessment of trade-offs, benefits, costs, cost-effectiveness, feasibility.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

a) Use basic tools to discuss the impacts of human-environment interactions b) Analyze climate change economic issues at the microeconomic level c) Analyze policy options available for addressing the impacts of climate change d) Apply the economic concepts learned to the analysis of real-world problems

Course Resources

Course Website(s)

All materials, including class lectures and relevant readings will be available on Blackboard. http://bb.ndu.edu.lb/

Useful web sites

- The World Bank web site (www.worldbank.org)
- World Bank Development Data and Statistics (www.worldbank.org/data/)
- International Monetary Fund (www.imf.org)
- United Nations Economic and Social Development (www.un.org/ecosocdev/)
- United Nations Statistics Division (unstats.un.org/unsd/)

108. • United Nations Development Program (www.undp.org)

109. • Human Development Report (hdr.undp.org) Recommended Course Texts and Materials

- • Harris, J., T. Wise, K. Gallagher, N. Goodwin. 2001. A Survey of Sustainable Development: Social and Economic Dimensions. Island Press.
- • Chasek, P., D. Downie, J. Welsh Brown. 2006, Global Environmental Politics. 4th ed., Prentice Hall International.
- • The Millennium Ecosystem Assessment, 2005. A framework for Assessment and the Current State and Trends: Findings of the Condition and Trends Working Group. Ecosystems and Human Well-being. All reports are available online at http://www.millenniumassessment.org/en/index.aspx

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- • Hackett, S. C. (2006) Environmental and Natural Resource Economics: Theory, Policy, and the Sustainable Society. M.E. Sharpe, Armonk, NY (3rd ed.)
- • Ostrom, E. 1990. Governing the Commons: The Evolution of Institutions for Collective Action. Cambridge University Press, New York

- • Ostrom, E. 2000. Collective Action and the Evolution of Social Norms. Journal of Economic Perspectives 13 (4): 137-158. Other readings from a variety of sources will be suggested as we go along the different topics. Where possible, I will post links to these supplementary readings on blackboard. Optional Course Texts and Materials
- • Ecosystems and Human Well-being: A Framework for Assessment. 2003. Island Press.
- • Dietz et.al. 2002. The Drama of the Commons. National Research Council
- • Titenberg, T. 2002. The tradable Permits Approach to Protecting the Commons: What Have We Learned? Pages 197-232 in E. Ostrom, T. Dietz, and N. Dolsak, eds. The Drama of the Commons. National Academy Press, Washington, DC.
- • Farrow, S. and Zerbe, R. (2013). Principles and Standards for Benefit-Cost Analysis
- • Intergovernmental Panel on Climate Change (IPCC) website: http://www.ipcc.ch/
- • World Bank: World Development Reports
- • United Nations: Human Development Reports
- • Millennium Ecosystem Assessment reports
- • Arab Forum for Environment and Development Assignments and Grading Scheme

Grading System The University uses the following system of grades. This system consists of letter grades with their corresponding numerical ranges (i.e. percentage equivalent, and the 4.0 point maximum).

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Grade Description

A^+ Outstanding A Excellent A^- Very Good B^+ Good

B Good B^- Good C^+ Satisfactory C Satisfactory C^- Passing D^+ Passing D Lowest Passing F Failure UW Unofficial Withdrawal

Quality Point Value

4.0 4.0 3.7 3.3 3.0 2.7 2.3 2.0 1.7 1.3 1.0 0.0 0.0 The grade "UW" is assigned by the instructor when a registered student has never attended a class or has ceased attending and has not submitted an official course withdrawal request to the Office of the Registrar. This grade is computed as an F grade in the grade-point average.

Percentage Equivalent

97-100 93-96 89-92 85-88 80-84 77-79 73-76 70-72 66-69 63-65 60-62 0-59

3

Grading Policy

Tasks Participation & class work 10% Research paper 15% Presentation 10% Mid Term 25% Final Exam 40% Total 100%

Assessment

The assessment will call upon students to demonstrate:

- Thorough understanding of the acquired knowledge.
- Critical thinking and complex problem solving ability.

Assessments: In addition to the Mid Term and Final examinations, there are the following assessments:

One of the important course requirements is a research paper of approximately 15 pages (double-spaced, font: times new roman 12). The paper can address any issue of interest relevant to climate change economics and policy. Students should make an appointment to see me and have a topic approved before November 21st (at the latest). In class, as we go through the first half of the semester, I'll highlight possible paper topics as they come up in readings or discussions. Towards the end of the semester, each student will give a brief oral presentation on the results of the research for the paper.

The objectives of this assignment are: 1) Contribute to the awareness-raising of decision-makers concerning the importance of climate change, 2) Promote the environmental assessment principles and integration of systematic environmental and socio-economic evaluation into national policy-making; 3) Contribute to the elaboration of common methods for such socioeconomic assessments.

Course Policies

NDU's Attendance Policy

Students should attend all classes on time. The maximum number of absences for this class is six per semester. Any student whose absences exceed the maximum limits shall automatically fail the course unless the student withdraws. No absence absolves a student from the responsibility of acting upon the material presented during his/her absence.

Make-up Exams

There are no make-ups for missed tests or for the final examination. Failure to sit for a scheduled test and/or final exam will result in an F on the test/exam. A student may be excused in exceptional cases if the student presents a valid documented

excuse (from the SAO in case of illness) to the chairperson of the department within 72 hours of the scheduled exam date. In such a case, a make-up exam will be given in accordance with the NDU academic rules and procedures.

Late Assignments

Late regular home assignments are not accepted. A penalty of 10% for every 24 hours of delay is put into effect for late assignments.

Office Hours

I am available for office hours during the week MWF at ... PM. Office hours may be used ideally to ask for guidance on an assignment or to ask questions concerning a subject that you were not clear on during class time. I encourage you to see me during my office hours if you are having difficulty with the class material or if you would like to discuss a research topic of interest to you. If you need to reach me at a time outside of office hours, you should send me an email in advance to schedule an appointment.

Classroom Protocol

- While understanding that we all are busy, your decision to register for this course is an indication that you have made it a high priority. Thus, extensions of assignment due dates are given only in extreme situations (death of a close family member, hospitalization, etc.) and require documentation on your part. Otherwise, due dates are fixed and non-negotiable. All assignments should be submitted on or before the assigned due date. Assignments past the due date will not be accepted for full credit. Examples of unreasonable extensions for an assignment include frequent computer malfunctions, outside class-work, or job responsibilities that inhibit meeting the required deadlines. If you anticipate missing a deadline on an assignment, you should send me an e-mail before the deadline. Unexcused assignments submitted after the due date may be returned ungraded or assigned a lower evaluation. Whether an extension is allowed will be at the instructor's discretion.

- All assignments must be typewritten and submitted in a professional manner. I reserve the right to return, for resubmission, any work that is not neat, legibly, and professionally submitted.

- Mobile phones should be turned off and out of sight. Phones may not be answered.

- Students must attend class with the required material (i.e. original textbook, notebook, pens, etc.).

- Once in class, students are expected to remain in class for the entire period.

- English must be the only language spoken in class at all times.

- Students must check their NDU email daily as this is the means used by the instructor to communicate. Students will receive notice via NDU email when the instructor posts announcements on the course's Blackboard. NDU's Academic Integrity Policy Students are expected and encouraged to be honest and to maintain the highest standards of academic integrity in their academic work and assignments at the

University. They shall refrain from any academic dishonesty or misconduct including; but not limited to:

- Plagiarism: the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Also, paraphrasing, summarizing, as well as well as direct

quotations are considered as plagiarism, if the original source is not properly cited.

- Cheating and assisting in cheating.
- Substituting a student in the taking of an examination.
- Substituting examination booklets.
- Submitting the same work for more than one course and the like or submitting papers written by others.
- Receiving or providing unauthorized help or assistance in any academic work or assignment. Intentional violation of program and degree requirements and regulation as established by the University.
- Dishonest reporting of computational, statistical, experimental, research, results, or the like. Disability Special needs: Any student who feels s/he may need an accommodation due to a disability should contact me to discuss those specific needs. Important Dates to Remember The date of Mid Term is announced in class, it will be on January 4. The final exam will be scheduled by the university at the end of the semester . Reading and writing assignments will be due on a regular basis and they will be announced in class and on blackboard. All important deadlines will be available on Blackboard and in the course schedule below.

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Detailed Course Schedule

TOPICS	READINGS
Sustainability and Climate change a) The Millennium Development Goals of the United Nations b) The Millennium Ecosystem Assessment Key components of human well-being Linkages between ecosystem services and human well-being	
1 Syllabus / Climate change economics and policy	

2

United Nations Reports UNDP, UNEP websites

The Millennium Ecosystem Assessment for the Arab region http://gis.cedare.int/arabma/docs/MA_final%20full%20Report_Low.pdf

3

Drivers of change of the Earth:

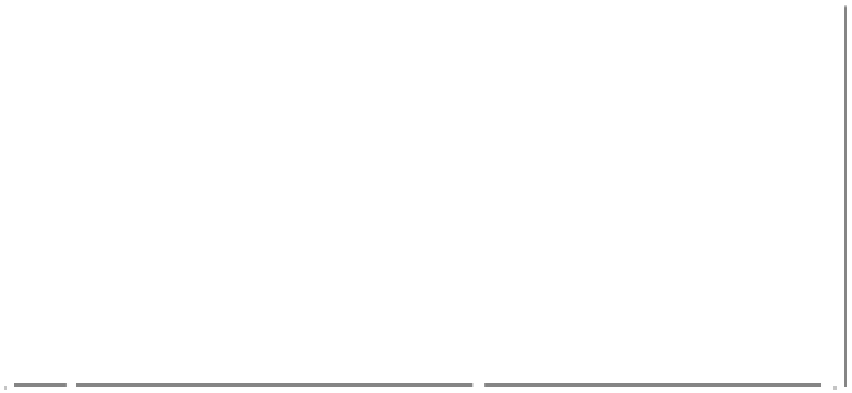
*Demographic drivers (population size, age and gender structure, and spatial distribution) *Economic drivers

(national and per capita income, macroeconomic policies, international trade)

*Sociopolitical (democratization, roles of women and local communities, role of private sector) *Scientific and technological (research and development, adoption of new technologies) *Cultural and religious (choices individuals make about what and how to consume and what they value).

Millennium Ecosystem Assessment Reports http://maweb.org

Impacts of the Kyoto Protocol on U.S. Energy Markets and Economic Activity (www.eia.doe.gov/oiaf/kyoto/kyotorpt.html)



4

Global Climate Change: Science, Policy, and Economics

Greenhouse Gas Emissions and Global Climate Change Modeling Carbon Dioxide Emissions Trends in Greenhouse Gas Emissions Global Climate Change Predictions

The Evidence Regarding Global Climate Change

International Action on Global Climate Change The Earth Summit The Kyoto Protocol

An Inconvenient Truth (movie) Hackett ch 11

5

Climate Change and Economic Development

• http://www.ipcc.ch/ • http://climatechange.worldbank.or

g/ • Adaptation to a changing climate in

7

		the Arab countries: a case for adaptation governance and leadership in building climate resilience http://www.preventionweb.net/en glish/professional/publications/v.p hp?id=29948

6	Decision-making: Individual vs. collective action The Rational Actor Paradigm Self-interest vs. social goals Cooperation in social dilemmas Individual behavior and collective action	Ostrom, E. 1990. Governing the Commons: The Evolution of Institutions for Collective Action. Cambridge University Press, New York Ostrom, E. 2000. Collective Action and the Evolution of Social Norms. Journal of Economic Perspectives 13 (4): 137- 158. Titenberg, T. 2002. The tradable Permits Approach to Protecting the Commons: What Have We Learned? Pages 197-232 in E. Ostrom, T. Dietz, and N. Dolsak, eds. The Drama of the Commons. National Academy Press, Washington, DC.
7	Climate Change Mitigation and Adaptation Mitigation of Climate Change Impacts, Adaptation and Vulnerability	Climate Change 2014 http://www.ipcc.ch/publications_and _data/publications_and_data_reports .shtml
8	Economic Valuation Methods Present value, future value, social discount rate, cost benefit	The Economic Valuation of Environmental Amenities and Disamenities: Methods and Applications: http://environment.yale.edu/files/bib lio/YaleFES-

	analysis, willingness to pay, contingent valuation method, travel cost method, hedonic pricing	00000201.pdf
	Students' presentations	

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Course	Climate change Economics and Sustainability Policy
Module 1	Introduction: Climate change economics and policy
Key Concepts	IPAT identity, Kaya identity, climate change economics, sustainability policy
Overview	Anthropogenic climate change represents perhaps the most significant and challenging global tragedy of the commons confronting the world's policymakers. This course begins with a module that explains anthropogenic greenhouse gas emissions as a function of a number of economic variables
Aim	The overriding aim of this module is to turn students able to discourse on climate change economics and sustainability policy.
Learning Outcomes	At the end of this module learners will be able to: 1. Understand the concept of IPAT (Impact = Population × Affluence × Technology) 2. Define the KAYA identity (Carbon Dioxide Emissions = Population × (GDP/Population) × (Energy/GDP) × (CO2 /Energy). 3. Understand economic rationality and the concept of climate change 4. understanding the complex factors influencing changes in carbon dioxide emissions

Units	Unit 1. Fundamental economic Concepts Unit 2. The relationship between environment and economics Unit 3. Natural ecosystems and their services Unit 4. Environmental problems as social dilemmas Unit 5. Values associated with the environment
Readings	Assigned readings from various websites
Activity	Ask students to browse the sites below: • World Meteorological Organization (WMO) • United Nations (UN) • United Nations Environment Programme (UNEP), (Geneva, Nairobi) • United Nations Framework Convention on Climate Change (UNFCCC) • United Nations and Climate Change • Convention on Biological Diversity (CBD) • Convention on Long-Range Transboundary Air Pollution • Global Environment Facility (GEF) • Linkages by International Institute for Sustainable Development (IISD) • IPCC Data Distribution Centre • The Ozone Secretariat, UNEP • United Nations Convention to Combat Desertification
Module 2	Sustainability and Climate Change
Key Concepts	Pillars of sustainability, climate change, mitigation, adaptation, The Millennium Development Goals of the United Nations, ecosystems and human well-being
Overview	In this module, we examine the nature and scope of sustainability in relation to climate change. We begin with a definition of sustainability and a discussion of its relationship to other fields of study. We emphasize strategies to ensure sustainability of both natural ecosystems and human well-being by integrating economic, environmental, social and cultural aspirations. The Millennium Development Goals of the United Nations and

	the Millennium Ecosystem Assessment reports will be used to illustrate the integration of information from natural and social sciences and to harmonize the use of ecosystem services with human needs

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Aim	The aims of this module are to: 1) distinguish between the different dimensions of sustainability, 2) introduce the Millennium Development Goals of the United Nations , 3) explore decision-making options that can harmonize the use of ecosystem goods and service with human needs
Learning Outcomes	At the end of this module, learners will be able to: • Distinguish between sustainability dimensions • Assess the status of the Millennium Development Goals of the United Nations in their country / surroundings • Examine decision-making to mitigate and adapt to climate change
Units	Unit 1. Sustainability Unit 2. The relationship between sustainability and economics Unit 3. the Millennium Development Goals of the United Nations Unit 4. The Millennium Ecosystem Assessment Unit 5. How to make decisions to mitigate and adapt to climate change
Readings	Millennium Ecosystem Assessment for the Arab region http://gis.cedare.int/arabma/docs/MA_final%20full%20Report_Low.pdf
Activity	Discussion related to the application of economic principles to environmental issues, such as climate change

Module 3	Human transformation of the Earth: drivers of change
Key Concepts	Drivers of change: Demographic, economic, sociopolitical, scientific and technological, cultural and religious. Benefits and Costs of Climate Change Mitigation , Threats caused by climate change, Policy Initiatives
Overview	In this module, we discuss- in a holistic view-the different drivers of change for the transformation of the earth (including climate change) * Demographic drivers (population size, age and gender structure, and spatial distribution) * Economic drivers (national and per capita income, macroeconomic policies, international trade) * Sociopolitical (democratization, roles of women and local communities, role of private sector) * Scientific and technological (research and development, adoption of new technologies) *Cultural and religious (choices individuals make about what and how to consume and what they value).
Aim	The aims are to discuss in a holistic view-the drivers of change for the transformation of the earth (including climate change); understand the threats caused by global climate change on humans and other living things through impacts on ecosystem functioning, biodiversity, capital productivity, and human health; analyze economically estimates of mitigation benefits, improved understanding of costs in the presence of various market distortions or imperfections, better tools for making policy choices under uncertainty, and alternate mechanisms for allowing flexibility in policy responses.

Learning Outcomes	At the end of this module, learners will be able to: Identify drivers of change Understand the threats caused by global climate change on well-being of humans and other living things through impacts on ecosystem functioning, biodiversity, capital productivity, and human health Analyze economically estimates of mitigation benefits, improved understanding of costs in the presence of various market distortions or imperfections, better tools for making policy choices under uncertainty, and alternate mechanisms for

	allowing flexibility in policy responses.
Units	Unit 1: Drivers of change Unit 2: Assessing the Benefits and Costs of Climate Change Mitigation Unit 3: Dealing with Uncertainty of climate policy Unit 4: International Policy Coordination
Readings	• Millennium Ecosystem Assessment Reports http://maweb.org • Impacts of the Kyoto Protocol on U.S. Energy Markets and Economic Activity (www.eia.doe.gov/oiaf/kyoto/kyotorpt.html): Comprehensive 1998 economic analysis of the costs of complying with the Kyoto Protocol, sponsored

	by the U.S. Energy Information Administration
Activity	Write a two-page essay in which you summarize what is known about global climate change. Discuss how the complexity, the long-term nature of the problem, the diffusion of the benefits, the uncertainty regarding global warming effects, and the international nature of any effective solution make this one of the most important, controversial, and challenging environmental policy problems we face today.
Module 4	Global Climate Change: Science, Policy, and Economics
Key Concepts	Greenhouse Gas Emissions and Global Climate Change , modeling Carbon Dioxide emissions, trends in greenhouse gas emissions, global climate change predictions, evidence regarding climate change, international action on Climate Change: The Earth Summit , The Kyoto Protocol
Overview	This module shows that human activity has increased concentrations of carbon dioxide in the atmosphere. According to the Intergovernmental Panel on Climate Change (IPCC), the present carbon dioxide concentration in the atmosphere has not been exceeded during the past 650,000 years, and likely not during the past 20 million years. The current rate of increase is unprecedented during at least the past 20,000 years. Climate models are extremely complex, and so as our understanding of the world's climate improves, so too will our ability to model and predict climate change caused by anthropogenic greenhouse gas emissions.
Aim	The aims of this module are to: 1) understand that deterioration of natural ecosystems due to climate change could possibly have negative consequences for the world's economy, 2) introduce climate change history, models and predictions , 3) discuss nternational action on climate change: The Earth Summit and The Kyoto

	Protocol.
Learning Outcomes	At the end of this module, learners will be able to: • Understand that major alterations to natural ecosystems due to climate change could possibly have negative consequences for the world's economy • Examine trends in greenhouse gas emissions • Explore assumptions of climate change scenarios • Discuss the Earth Summit and The Kyoto Protocol that includes three incentive- based economic instruments.
Units	Unit 1: The scientific aspect of climate change Unit 2: Assessing the Benefits and Costs of Climate Change Unit 3: Policy Initiatives
Readings	• Hackett ch 11
Activity	An Inconvenient Truth (movie)
Module 5	Climate Change and Economic Development
Key Concepts	Global warming, Greenhouse gas emissions, impact of climate change on developing nations

Overview

This module examines global warming and climate change impacts on developing nations, particularly the poor, and identifies the most vulnerable zones across the world. In addition, weather related problems are also discussed. The cost of these direct and indirect environmental catastrophes will be primarily borne by the poor as they directly depend on environmental resources for their livelihood and are impacted by adverse health conditions and poor/inadequate housing and sanitation that can be affected by climate change. Strategies to impede the progress of global warming and policy adaptations to help the “poor” are also discussed.

Aim

The overriding aims of this module are: 1) to examine the topic of global warming and climate change and its impact on developing nations, particularly the poor; and 2) to discuss the strategies that need to be pursued to impede the pace of global warming and climate change.

Learning

Outcomes

At the end of this module, learners will be able to:

• Demonstrateknowledgeontheconceptofclimatechange • Analyze the development challenges caused by climate change • Examine strategies to slow down global warming and adapt policies to help the

poor, mostly affected by this global problem

Units

Unit 8.1: The scientific controversies related to estimating the human and environmental impacts of global environmental problems, such as climate change Unit 8.2: The impacts of climate change on developing nations, particularly the poor Unit 8.3: Policies to impede the progress of global warming

- □http://www.ipcc.ch/
- □http://climatechange.worldbank.org/
- □Adaptation to a changing climate in the Arab countries: a case for adaptation governance and

leadership in building climate resilience
http://www.preventionweb.net/english/professional/publications/v.php?id=29948

Readings

- Discuss the role and responsibilities of developing and developed countries with respect to climate change and its impact on the economy and the lives of people.

- Watch the movie: An Inconvenient Truth.

Activity

Key Concepts

The Rational Actor Paradigm, Self-interest vs. social goals, Cooperation in social dilemmas, Individual behavior and collective action

Overview

This module provides an overview on how individuals make decisions in collective action situation

Aim

The aim of this module is to explain individual behavior in the case of a collective action by integrating social psychological theories of environmentalism with the parallel theories of behavior in commons dilemmas

Learning Outcomes

At the end of this module learners will be able to:

- Understand the social dimension of environmental problems
- Analyze decision-making from an economic perspective (RAP)

Understand cooperation in social dilemma situations

Units

Unit 1. Environmental problems are social issues Unit 2. The Rational Actor Paradigm Unit 3. Collective action cooperation

Readings

Ostrom, E. 1990. Governing the Commons: The Evolution of Institutions for Collective Action. Cambridge University Press, New York

Ostrom, E. 2000. Collective Action and the Evolution of Social Norms. Journal of Economic Perspectives 13 (4): 137-158.

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	Titenberg, T. 2002. The tradable Permits Approach to Protecting the Commons: What Have We Learned? Pages 197-232 in E. Ostrom, T. Dietz, and N. Dolsak, eds. The Drama of the Commons. National Academy

	Press, Washington, DC.
Activity	Discuss the climate change problem in terms of individual vs. collective decisions to reduce its impact on the economy and the lives of people
Module 7	Climate Change Mitigation and Adaptation
Key Concepts	Options for mitigation of Climate Change. Impacts, Adaptation and Vulnerability. Risk, uncertainties and ethical foundations
Overview	This module is two-fold: (1) it provides the options for mitigating climate change and their underlying technological, economic and institutional requirements. It lays out risks, uncertainty and ethical foundations of climate change mitigation policies on the global, national and local level, investigates mitigation measures for all major sectors and assesses investment and finance issues; (2) it considers the vulnerability and exposure of human and natural systems, the observed impacts and future risks of climate change, and the potential for and limits to adaptation. The module assesses risks and opportunities for societies, economies, and ecosystems around the world.
Aim	The overriding aims of this module are to
Learning Outcomes	At the end of this module, learners will be able to: Examine options for mitigating climate change and their underlying technological, economic and

	institutional requirements. Assess the vulnerability and exposure of human and natural systems, the observed impacts and future risks of climate change, and the potential for and limits to adaptation.
Units	Unit 1. State of scientific knowledge relevant to climate change Unit 2. Climate change mitigation Unit 3. Climate change adaptation
Readings	http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml
Activity	Visit to the Ministry of Environment of Lebanon – division of climate change to examine the new related studies done by the government
Module 8	Economic Valuation Methods
Key Concepts	Present value, future value, social discount rate, cost benefit analysis, willingness to pay, contingent valuation method, travel cost method, hedonic pricing, ecosystem assessment, protected areas management
Overview	This module overviews basic microeconomics as it applies to climate change economics. Also, it presents the methodologies available for quantifying benefits and costs. A discussion of economic valuation methods include:

	• □Tradeoffs between current and future consumption. • □Using an appropriate social discount rate. • □How to correctly value the environment as a resource whose depletion represents a cost to future generations. • □How to internalize negative externalities and correct for market failures. • □A review of the circular flow diagram, including the link between nature and the economy.
Aim	The overall aims of this module are: 1) to run a cost-benefit analysis, 2) to define types of economic values and total willingness to pay, 3) to understand the various nonmarket valuation methods , 4) to present the biases associated with each valuation method, 5) to provide an overview of cost estimation methods, 6) to

	illustrate other complexities including the valuation of human life, benefits transfers, the monetization of intangibles, the treatment of risk and the choice of the discount rate.
Learning Outcomes	At the end of this module, learners will be able to: • □Outline the complexities of cost-benefit analysis • □Define types of values: use value, option value, existence value and total willingness to pay

	• Classify the available nonmarket valuation methods • Examine the potential biases and complexities associated with the contingent valuation method and other cost estimation methods
Units _____	Unit 1: Current conditions of ecosystems and the effect of climate change on human well-being Unit 2: Essential tools of environmental analysis and economic valuation, including the assessment of trade-offs, benefits, costs, cost-effectiveness, contingent valuation, travel cost method, hedonic pricing Unit 3: Ecological and social systems interactions, as well as trade-offs involved in decisions concerning climate change Unit 4: Economic policy to better achieve human development
Readings _____	• The Millennium Ecosystem Assessment (http://www.maweb.org/en/index.aspx) • Environmental valuation http://cmsdata.iucn.org/downloads/09_compendium_of_case_studies_introducti on.pdf • Environmental Valuation: Challenges and Practices http://www.rff.org/Documents/08_Tropics_Conference/Tropics_Conference_Pap ers/Tropics_Conference_Dixon_Environmenal_Valuation.pdf • The Economic Valuation of Environmental Amenities and Disamenities: Methods and Applications: http://environment.yale.edu/files/biblio/YaleFES-00000201.pdf

Activity	• An in-class example or problem set related to discounting will let the students learn with a hands-on example and will likely ease their minds about the difficulty of the concept of environmental valuation. A spreadsheet problem is a hypothetical example of two proposed uses for an area (development project vs. protected area). A set of costs and benefits is given for a 5-year period. The problem is set up so that the net present value changes from positive to negative with a change in the discount rate. This is a nice illustration of the effect of the discount rate. The example is also set up so that a different project would be pursued at a different rate. • Case study

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Instructor Information

Course Identification

COURSE SYLLABUS

ECN434

Environmental and Resource Economics

Notre Dame University – Louaize Faculty of Business Administration and Economics

Spring 2014

Instructor: Office Location: Telephone: Office Hours: E-mail:

Dr. Nancy Kanbar Faculty of Business Administration and Economics 09-218950 MWF 4-5 pm

nkanbar@ndu.edu.lb

Course Number: Course Name:

Course Location: Class Times: Prerequisites: Faculty Web Page:

ECN 434

Environmental and Resource Economics

FBAE MWF ECN 211, 212 http://www.ndu.edu.lb

Course Description/Overview

This course will develop in students an in-depth understanding of environmental and resource economics.

The course covers topics in environmental, resource, and ecological economics, with a focus on the sustainability of human-economic activities and their impact on the natural environment and economic valuation of environmental issues and development policies. We will discuss both traditional neoclassical economic models and recent extensions in the areas of behavioral and ecological economics. The focus will be on international issues with important environmental implications that have become prominent on the environmental policy agenda recently; particularly biodiversity loss and climate change. Besides examining global environmental issues, we will link global environmental problems with that of Lebanon's environmental situation.

Course Learning Objectives

The overarching goals of this course are:

1

a) to provide a critical approach to environmental and resource economics in the context of the global issues, such as climate change;

b) to examine and assess environmental challenges using a multi-disciplinary methodology within the context of sustainability;

c) to raise awareness of the role of learners to assess economic policies in enabling them to reflect critically

on possible sustainable solutions for today's environmental problems; thus preparing for a sustainable future for all; and

d) to use case studies as tools to help learners identify risks related to environmental issues in various countries.

Course Content Learning Outcomes

Upon successful completion of this course, students will be able to:

110. a) Use economic logic and basic analytical tools to discuss sustainability and the impacts of human-environment interactions

111. b) Analyze environmental and resource economic issues at an intermediate microeconomic level

112. c) Understand the scientific controversies related to estimating the anthropogenic and natural impacts of global environmental problems

113. d) Use economic tools to analyze policy options available for addressing the impacts of environmental problems and the political struggles surrounding both the estimates of potential damage and the proposed policy responses

114. e) Apply the economic concepts learned in class to the analysis of real-world problems

Course Resources

Course Website(s)

All materials, including class lectures and relevant readings will be available on Blackboard.
http://bb.ndu.edu.lb/

Useful web sites

- The World Bank web site (www.worldbank.org)
- World Bank Development Data and Statistics (www.worldbank.org/data/)
- International Monetary Fund (www.imf.org)
- United Nations Economic and Social Development (www.un.org/ecosocdev/)
- United Nations Statistics Division (unstats.un.org/unsd/)
- United Nations Development Program (www.undp.org)
- Human Development Report (hdr.undp.org)

Required Course Texts and Materials

- Hackett, S. C. (2006) Environmental and Natural Resource Economics: Theory, Policy, and the

Sustainable Society. M.E. Sharpe, Armonk, NY (3rd ed.)

- Titenberg, T. (2006). Environmental and Natural Resource Economics. Pearson. 2

Other readings from a variety of sources will be suggested as we go along the different topics. Where possible, I will post links to these supplementary readings on blackboard. Additional recommended readings for interested students are available from the instructor.

I strongly recommend that you have a microeconomics text as a reference, such as: Karl E. Case, Ray C. Fair, and Sharon M. Oster. Principles of Economics, 10th ed., Prentice Hall International.

Optional Course Texts and Materials

- Stavins, R. N. (2000) Economics of the Environment: Selected Readings. W. W. Norton and Company, NY (4th ed.)
- Farrow, S. and Zerbe, R. (2013). Principles and Standards for Benefit-Cost Analysis
- World Bank: World Development Reports
- United Nations: Human Development Reports
- Millennium Ecosystem Assessment reports

- • □Arab Forum for Environment and Development Assignments and Grading Scheme Grading System The University uses the following system of grades. This system consists of letter grades with their corresponding numerical ranges (i.e. percentage equivalent, and the 4.0 point maximum).

Grading Policy

Grade Description

A^+ Outstanding A Excellent A^- Very Good B^+ Good

B Good B^- Good C^+ Satisfactory C Satisfactory C^- Passing D^+ Passing D Lowest Passing F Failure UW Unofficial Withdrawal

Quality Point Value

4.0 4.0 3.7 3.3 3.0 2.7 2.3 2.0 1.7 1.3 1.0 0.0 0.0 The grade "UW" is assigned by the instructor when a registered student has never attended a class or has ceased attending and has not submitted an official course withdrawal request to the Office of the Registrar. This grade is computed as an F grade in the grade-point average.

Tasks Participation & class work 5% Group project/practicum 20% Presentation 10% Current events/articles collection and analysis 10% Mid Term 25% Final Exam 30% Total 100%

Percentage Equivalent

97-100 93 - 96 89 - 92 85 - 88 80 - 84 77 - 79 73 - 76 70 - 72 66 - 69 63 - 65 60 - 62 0 - 59

Assessment

The assessment will call upon students to demonstrate:

- • □Thorough understanding of the acquired knowledge.
- • □Critical thinking and complex problem solving ability. Assessments: In addition to the Mid Term and Final examinations, there are the following assessments: Practicum assignment: Each group consists of 3 students who are required to choose a local or global environmental problem and examine its impact on economic development. With the practicum assignment, students choose a topic, collect data, work in group, and communicate with each other and with other stakeholders involved in the project. Each group will consist of 3 students. Each group is required to submit a report of about fifteen pages in length where they highlight their topic. Also, students are required to present data about their selected topic. This assignment helps integrate the knowledge acquired in class to real life applications by merging theory with practice. Possible themes to explore this semester: socio- economic evaluation of maritime activities, climate change economics, socio-economic assessments, valuation of ecosystems, assessment of the cost of environmental degradation, analyses of the marine and coastal environment in collaboration with stakeholders/ policy influence. The objectives of this assignment are: 1) Contribute to the awareness-raising of decision-makers; 2) Promote the progressive appropriation of environmental assessment principles and integration of systematic environmental and socio- economic evaluation into national policy-

making; 3) Contribute to the elaboration of common methods for such socioeconomic assessments adapted to Mediterranean countries. Presentation: Each member of the group will present one aspect of the group project studied above. Thus, each student will be graded individually for his part of the presentation. Please note that you will be tested on the other group presentations. Current events / Articles collection and analysis: Each student will collect articles throughout the course related to climate change issues and you will write up a short summary of each article discussing the relationship between the article and what you learned in class. At the start of each class, and without prior notice, one or two students will be asked to present their article in class. I will devote ten minutes of class time to a brief discussion about the articles and how they relate to what is covered in the course or will shortly be covered. At the end of the semester, each student will submit all the articles he/she collected along with the summaries.

Course Policies

NDU's Attendance Policy

Students should attend all classes on time. The maximum number of absences for this class is six per semester. Any student whose absences exceed the maximum limits shall automatically fail the course unless the student withdraws. No absence absolves a student from the responsibility of acting upon the

material presented during his/her absence.

Make-up Exams

There are no make-ups for missed tests or for the final examination. Failure to sit for a scheduled test and/or final exam will result in an F on the test/exam. A student may be excused in exceptional cases if the student presents a valid documented excuse (from the SAO in case of illness) to the chairperson of the department within 72 hours of the scheduled exam date. In such a case, a make-up exam will be given in accordance with the NDU academic rules and procedures.

Late Assignments

Late regular home assignments are not accepted. A penalty of 10% for every 24 hours of delay is put into effect for late assignments.

Office Hours

I am available for office hours during the week MWF at ... PM. Office hours may be used ideally to ask for guidance on an assignment or to ask questions concerning a subject that you were not clear on during class time. I encourage you to see me during my office hours if you are having difficulty with the class material or if you would like to discuss a research topic of interest to you. If you need to reach me at a time outside of office hours, you should send me an email in advance to schedule an appointment.

Classroom Protocol

• While understanding that we all are busy, your decision to register for this course is an indication that you have made it a high priority. Thus, extensions of assignment due dates are given only in extreme situations (death of a close family member, hospitalization, etc.) and require documentation on your part. Otherwise, due dates are fixed and non-negotiable. All assignments should be submitted on or before the assigned due date. Assignments past the due date will not be accepted for full credit. Examples of unreasonable extensions for an assignment include frequent computer malfunctions, outside class-work, or job responsibilities that inhibit meeting the required deadlines. If you anticipate missing a deadline on an assignment, you should send me an e-mail before the deadline. Unexcused assignments submitted after the due date may be returned ungraded or assigned a lower evaluation. Whether an extension is allowed will be at the instructor's discretion.

• All assignments must be typewritten and submitted in a professional manner. I reserve the right to return, for resubmission, any work that is not neat, legibly, and professionally submitted.

• Mobile phones should be turned off and out of sight. Phones may not be answered.

• Students must attend class with the required material (i.e. original textbook, notebook, pens, etc.).

- Once in class, students are expected to remain in class for the entire period.

- English must be the only language spoken in class at all times.

- Students must check their NDU email daily as this is the means used by the instructor to communicate. Students will receive notice via NDU email when the instructor posts announcements on the course's Blackboard. NDU's Academic Integrity Policy Students are expected and encouraged to be honest and to maintain the highest standards of academic integrity in their academic work and assignments at the University. They shall refrain from any academic dishonesty or misconduct including; but not limited to:

- Plagiarism: the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Also, paraphrasing, summarizing, as well as well as direct quotations are considered as plagiarism, if the original source is not properly cited.

- Cheating and assisting in cheating.

- Substituting a student in the taking of an examination.

- Substituting examination booklets.

- Submitting the same work for more than one course and the like or submitting papers written by others.

- Receiving or providing unauthorized help or assistance in any academic work or assignment. Intentional violation of program and degree requirements and regulation as established by the University.

- Dishonest reporting of computational, statistical, experimental, research, results, or the like. Disability Special needs: Any student who feels s/he may need an accommodation due to a disability should contact me to discuss those specific needs. Important Dates to Remember The date of Mid Term is announced in class, it will be on January 4. The final exam will be scheduled by the university at the end of the semester . Reading and writing assignments will be due on a regular basis and they will be announced in class and on blackboard. All important deadlines will be available on Blackboard and in the course schedule below.

Detailed Course Schedule

TOPICS

READINGS

1

Hackett (chapter 1) Case and Fair (ch 1, 2)

2

Value Systems and Economic Systems

Fundamentals of Ethical Systems Deontological Ethics, Teleological Ethics A Closer Look at Utilitarianism Self-Interest, the Common Good, and Social Order Private Property Positive and normative economics Pareto efficiency and the Kaldor/Hicks criteria

Hackett (chapter 2)

3

The Economics of Market Allocation

Conditions Required for a Well-functioning Competitive Market Market Demand and Supply Market Equilibrium and Efficiency

Market Failure

- Monopoly, Cartels, and Market Power
- Externalities
- Common-Pool Resources and Public Goods: Collectively Produced and/or Consumed Goods
- Imperfect Information Perspectives on Market Failures and Government Intervention

Hackett (chapter 3) Case and Fair (ch 3,4)

4

Valuing the environment: Concepts

Theory of consumer choice and the demand curve, Profit maximization and the supply curve, Economics of market allocation

Titenberg (chapter 2), Case and Fair (3, 4)

5

Valuing the Environment: Methods

Quantifying benefits and costs, valuation techniques, benefit-cost analysis, cost-effectiveness analysis, impact analysis, discount rate, policy process, nonmarket goods and services.

Titenberg (chapter 3)

6

Property Rights, Externalities and Environmental Problems. Market Failures and Policy Interventions Positive and Negative Externalities Property Rights and Negative Externalities

Social Cost as the Sum of Private and External Cost Competitive Markets Are Inefficient When There Are Negative Externalities

Hackett (Chapter 4) Titenberg (Chapter 4)

7

Case study: solid waste: cost of degradation

Hardin, G. 1968. The Tragedy of the Commons. Science 162: 1243-48.

UNEP-Ministry of Environment (2013b).

7

		Environmental Resources Monitoring in Lebanon project, Analysis of the current land use and socio- economic activities in the coastal zone.
8	Case study: protected areas: cost of biodiversity loss	Business Plan for protected areas management in Lebanon (Ministry of Environment report
9	Students' presentations / practicums	

8

Course	Environmental and Resource Economics
Module 1	Introduction to Environmental and Resources Economics
Key Concepts	Scarcity, economic decision, opportunity cost, economic rationality, production possibilitiy frontier (PPF)
Overview	This module provides an overview of basic microeconomics as it applies to natural resource and environmental economics. It includes much of the basic economics terminology and describes the framework

	from within which the various topics in the text will be presented. Students without much background in economics may find this material abstract and difficult. It is recommended to spend extra time on this module, especially when teaching the non-major.
Aim	The overriding aim of this module is to turn students able to discourse on environmental and resource economics.
Learning Outcomes	At the end of this module learners will be able to: 1. Understand the concept of scarcity 2. Define opportunity cost. 3. Understand economics and economic rationality
Units	Unit 1. Fundamental Concepts Unit 2. The relationship between environment and economics Unit 3. Applying the Concepts
Readings	• Hackett (chapter 1); • Case and Fair (ch 1, 2)
Activity	Price is a simple indicator of value for things traded in markets. Yet if the economic pro also applies to something like a wilderness area, which has no price to indicate value, how are we to assign value to it? In your answer, consider the following: a. Think of some specific indicators of the monetary value of a wilderness area th analyst could measure. b. What are some monetary indicators of the opportunity cost of wilderness preservati c. If we were to make a decision regarding how to manage the land area under an based on the information you provided in (a) and

	(b) above, what other elements of might be omitted and thus not be reflected in the policy decision?
Module 2	Value Systems and Economic Systems
Key Concepts	Deontological Ethics, Teleological Ethics, Utilitarianism, Self-Interest, the Common Good, and Social Order , Private Property, Positive and normative economics, Pareto efficiency and the Kaldor/Hicks criteria
Overview	Throughout time, societies have been motivated by widely different social and philosophical value systems for determining benefits and costs and so have had different answers to the question of what a good way to allocate things might be. As a consequence, many different kinds of economies were observed. Understanding economic systems provides insight into otherwise inexplicable aspects of our lives and the choices that we make. In this module, students will investigate several fundamental questions related to human values and economic systems.
Aim	The aim is to examine basic economic questions of (1) what should we allocate resources to produce, (2) by what method should we produce, and (3) who receives what is produced? The fundamental issues discussed in this chapter provide a broad foundation for the analysis of markets, market failure, and social policy that is to follow
Learning Outcomes	At the end of this module learners will be able to: 1. Understand the fundamentals of ethical systems

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	2. Define utilitarianism 3. Understand Self-Interest, the Common Good, and Social Order 4. Define Private Property 5. Define the economic approach and distinguish between positive and normative economics 6. Understand Pareto efficiency and the Kaldor/Hicks criteria
Units	Unit 1. Fundamental of ethical systems Unit 2. Utilitarianism in economics Unit 3. Self-Interest, the Common Good, and Social Order Unit 4. Define Private Property Unit 5. Compare positive and normative economics Unit 6. Understand Pareto efficiency and the Kaldor/Hicks criteria
Readings	• Hackett (chapter 2) • Business Plan for protected areas management in Lebanon (Ministry of Environment report Internet Classics Archive (http://classics.mit.edu/Browse/index.html): Free on-line classic texts, primarily of Greco-Roman origin. • McMaster University Archive for the History of Economic Thought (www.economics.mcmaster.ca/ugcm/3113/): Free full-text books on the Internet by authors such as Aristotle, Locke, Ricardo, Rousseau, and Smith who wrote about economics. This is a good place to get primary source material.

Activity	Classroom debate activity: Debate consists of reasoned arguments for or against a given proposition. Form two groups in the class (affirmative and negative) for the purpose of debating the following proposition: Resolved: All social policy should be utilitarian-ethical. Members of each group should be given a week or so to research the issues. The debate will occur in a panel moderated by the professor. Two members of each group will serve as panelists, and any additional group members can serve as researchers.
Module 3	The Economics of Market Allocation
Key Concepts	Well-functioning competitive market, market demand and supply, market equilibrium and efficiency, market failure (monopoly, cartels, market power), externalities, common-pool resources and public goods
Overview	In this module, students will learn the basis of neoclassical market microeconomics, with particular attention to the conditions that are required for the existence of a well-functioning competitive market. In the process, we will develop a model of supply and demand. We will also learn what it means to say that this market will efficiently allocate scarce resources in equilibrium. The conditions required for such a market to function may fail to hold, however, and so we will find out how markets are distorted and efficiency is impaired by these market failures.
Aim	The aim of this module is to examine the fundamentals of neoclassical market microeconomics. This basic understanding of market economics will form the analytical framework for the chapters that follow, which review the theory of externalities and forms the economic argument for environmental regulations.

Learning Outcomes	At the 1. 2. 3. 4. 5. 6. end of this module learners will be able to: Understand market capitalism Examine the conditions required for a well-functioning competitive market Develop the theory of market demand and supply Address the concept of market equilibrium and efficiency Identify some possible sources of market failure Define externalities, common pool resources and public goods

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Units

Unit 1. Market capitalism Unit 2. A well-functioning competitive market Unit 3. Market demand and supply Unit 4. Market equilibrium and efficiency Unit 5. Market failure Unit 6. Externalities Unit 7. Common pool resources and public goods

- Hackett (chapter 3)
- Case and Fair (ch 3, 4)

Readings

Activity

Classroom debate activity: Debate consists of reasoned arguments for or against a

given proposition. Form two groups in the class (affirmative and negative) for the purpose of debating the following proposition: Due to overwhelming market failures, the invisible hand of the market must be directed by the visible hand of government regulation. Members of each group should be given a week or so to research the issues. The debate will occur in a panel, moderated by the professor

Key Concepts

Individual and market demand, total and marginal benefits, total willingness to pay and marginal willingness to pay, marginal and total cost, the present value of net benefits, discounting, how benefit-cost analysis, optimality and

economic efficiency.

Overview

This module provides the basic microeconomic concepts related to valuing the environment.

Aim

The aim of this module is to teach students the economic principles, graphs and jargon to apply when valuing the environment.

Learning Outcomes

At the 1.

2. 3.

4.

5. 6.

end of this module learners will be able to: Derive a demand curve and distinguish between individual and market demand, total and marginal benefits, total willingness to pay and marginal willingness to pay. Derive the marginal cost curve. Distinguish between marginal and total cost. Define present value and the discount rate. Illustrate the basic discounting equations. Calculate the present value of net benefits and show how benefit-cost analysis can be used to evaluate specific options. Derive net benefits graphically. Define optimality and economic efficiency. Apply these concepts to real world examples

Units

Unit 1. The Human Environment Relationship Unit 2. Normative Criteria for Decision-Making Unit 3. Finding the Optimal Outcome Unit 4. Applying the Concepts

- Titenberg (chapter 2: Valuing the Environment: Concepts)

Readings

- Should humans place an economic value on the environment? Discuss the issues related to the monetization of nonmarket values. Can you think of a local example where this is relevant? Controversial?

- An in-class example or problem set related to discounting will not only let the students learn with a hands-on example, but will likely ease their minds about the difficulty of the concept of valuing the environment. Having the students learn how to use a program such as excel will facilitate the teaching in later chapters.

- A spreadsheet problem set can be used as a hypothetical example of two proposed uses for a coastal area. Obviously, one can think of many different

Activity

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	scenarios and sets of numbers. You can tell the students, for example, that a coral reef area will either be

	protected or mined. A set of costs and benefits is given for a 10-year period. Show students that the net present value can change from positive to negative with a change in the discount rate. This is a nice illustration of the effect of the discount rate.
Module 5	Valuing the Environment: Methods
Key Concepts	Quantifying benefits and costs, valuation techniques, benefit-cost analysis, cost- effectiveness analysis, impact analysis, discount rate, policy process, nonmarket goods and services.
Overview	This modules presents the methodologies available for quantifying benefits and costs. The concepts presented in module 4 are combined with the valuation techniques available. The quantification of costs (including damages) and benefits is discussed with an emphasis on the complexity of monetizing nonmarket goods and services. Valuation methods are classified and the "how-to" of benefit-cost analysis, including the treatment of risk, are outlined. Types of values are also presented. Alternatives to benefit-cost analysis such as cost-effectiveness analysis and impact analysis are also discussed.
Aim	The overriding aims of this module are: to outline the complexities of cost-benefit analysis including the monetization of costs and benefits, define types of values, classify the nonmarket valuation methods, present the potential biases associated with the contingent valuation method and illustrate other complexities including the valuation of human life, benefits transfers, the monetization of intangibles, the treatment of risk and the choice of the discount rate.
Learning	At the end of this module, learners will be able to: 1. Outline the complexities of cost-benefit analysis

Outcomes	including the monetization of costs and benefits. 2. Define types of values: use value, option value, existence value and total willingness to pay. 3. Classify the available nonmarket valuation methods by whether they are based on observed behavior or a hypothetical market and whether they are direct or indirect. 4. Present the potential biases associated with the contingent valuation method. 5. Provide an overview of cost estimation methods. 6. Illustrate other complexities including the valuation of human life, benefits transfers, the monetization of intangibles, the treatment of risk and the choice of the discount rate. 7. Present alternatives to benefit-cost analysis: cost-effectiveness analysis and impact analysis. 8. Illustrate the valuation of the environment using examples.
Units	Unit 1: Valuing Benefits (Types of Values, Classifying Valuation Methods) Unit 2. Issues in Benefits Estimation Unit 3. Approaches to Cost Estimation Unit 4. Treatment of Risk Unit 5. Choosing the Discount Rate Unit 6. Cost-Effectiveness Analysis Unit 7. Impact Analysis
Readings	Titenberg (chapter 3: Valuing the Environment: Methods)
Activity	Ask the students to fill out a questionnaire that illustrates various types of willingness to pay questions. I intentionally build into the questions some of the potential biases that can be associated with contingent valuation surveys in order to illustrate to them (a) how easy it is to unintentionally bias a question; (b) how to avoid some biases; and (c) what protest bids looks like.

Module 6	Property Rights, Externalities and Environmental Problems. Market Failures and Policy Interventions
Key Concepts	Inefficiencies caused by the lack of well-defined property rights, market failures, the role for the government, positive externalities, negative externalities
Overview	In this module, we discuss markets, market failures, and efficiency by evaluating the economic theory of externalities. Externalities are positive or negative impacts on society that occur as a by-product of production and exchange. These effects are called externalities because they are not included in the factors that underlie market supply and demand, and their omission leads to the market failing to efficiently allocate resources. The inefficiency due to externalities can be used as a justification for government intervention in otherwise well-functioning competitive market systems.
Aim _____	The aim of this module is to discuss how many environmental goods and services will be underprovided under certain property rights regimes while environmental "bads" will be over provided. Markets and market failures are emphasized. The role for the government is introduced.
Learning Outcomes	At 1. 2. 3. 4. 5. 6. 7. 8. 9.

	the end of this module, learners will be able to: Define property right and efficient property right structure. Illustrate how well-defined, exchangeable property rights will lead to economic efficiency. Review consumer surplus, producer surplus and the maximization of net benefits. Define externality and illustrate market failure. Use examples to illustrate both positive and negative externalities. Discuss remedies for negative externalities Distinguish between various property rights regimes including private property, common property resource regimes and open access resources. Illustrate how open access regimes lead to overexploitation. Define public goods. Define free-rider. Illustrate other market imperfections such as the effects of monopoly power. Discuss the effects of discount rates on allocation decisions. Examine the reasons for the divergence of social and private discount rates. Define government failure. Define the Coase Theorem. 10. 11.
Units	Unit 1: Property Rights Unit 2: Externalities as a Source of Market Failure Unit 3: Designed Property Rights Systems Unit 4: Public goods Unit 5: Imperfect Market Structures Unit 6: Divergence of Social and Private Discount Rates Unit 7: Government Failure Unit 8: The Pursuit of Efficiency Unit 9: An Efficient Role for

	Government
Readings	Hackett Chapter 4: Externalities, Market Failures, and Policy Interventions Titenberg chapter 4: Property Rights, Externalities and Environmental Problems
Activity	Write a one-page essay in which you explain why, in the absence of government subsidies, competitive markets underproduce goods that feature positive externalities. Be sure to provide an example of a good that generates a positive externality, explain the nature of the external benefits and the two demand curves, and describe how they lead to different market equilibria. Draw and carefully label a diagram to illustrate your arguments.

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	Write a one-page essay in which you explain why, in the absence of government environmental regulation, competitive markets overproduce goods whose production involves the creation of negative externalities. Be sure to provide an example of a good that generates a negative externality, explain the nature of the external costs and the two supply curves, and describe how they lead to different market equilibria. Describe why allowing firms to pollute amounts to a production subsidy, and why this is inefficient, creating an economic motive for government policy intervention. Draw and carefully label a diagram to illustrate your arguments.
Module 7	Case study: solid waste: cost of degradation
Key Concepts	Importance of assessing the cost of environmental degradation, waste management, tragedy of the

	commons, rational actor paradigm, methodologies for cost of environmental degradation
Overview	This module identifies the waste problem in Lebanon. It describes the dumpsites that impose high environmental pressures; thus, actions are needed to solve this problem. It examines the waste problem and the cost of environmental degradation caused by this problem. This can be understood as a measure of the lost welfare due to environmental degradation. A loss in welfare includes but is not necessarily limited to: • Loss of healthy life and well-being of the population (e.g., burden of disease); • Economic losses (e.g., efficiency losses, competitiveness, forgone revenues); • Loss of environmental opportunities (e.g., loss of tourism, fisheries, biodiversity).
Aim	The aim of this module is to assess the cost of environmental degradation caused by the different dumpsites in Lebanon.
Learning Outcomes	At the end of this module, learners will be able to: • Demonstrate knowledge on the concept of cost of degradation due to waste • Analyze the economic challenges and loss of welfare caused by waste management • Understandthedifferentmethodologiestoassesscostofdegradation
	• Unit 1: The Importance of assessing the cost of environmental degradation

Units	• Unit2:ThewasteprobleminLebanon • Unit 3: methodologies for cost of environmental degradation
Readings	• Hardin, G. 1968. The Tragedy of the Commons. Science 162: 1243-48. • UNEP-Ministry of Environment (2013b). Environmental Resources Monitoring in Lebanon project, Analysis of the current land use and socio-economic activities in the coastal zone.
Activity	• Discuss the waste management problem in Lebanon and its impact on the economy and the lives of people in different regions of Lebanon
Module 8	Case study: protected areas: cost of biodiversity loss
Key Concepts	Total Economic Value (TEV), use values, non-use values, option values, bequest values and existence values, Willingness to Pay (WTP), Cost Benefit Analysis (CBA)
Overview	This module identifies and assesses the economic values of biodiversity. The goods and services provided by biodiversity include recreation and tourism, plant and wildlife habitat, genetic resources, etc. Many of these are not traded on commercial markets and therefore have no evident market value. The values of non-market goods and services need to be measured and expressed in monetary terms, so that they can be weighed on the same scale as commercially traded components. The concept of Total Economic Value (TEV) is a useful framework for identifying the various values associated with biodiversity. The TEV consists of its use values and non-use values. Students will also learn to estimate the WTP to preserve & protect

	biodiversity in a protected area, identify and assess the potential financial benefits that can be generated from the area, identify and value potential economic benefits to the local community, and conducting CBA to assess the overall feasibility
Aim	The overriding aims of this module are: to learn about use values (made up of its direct use values, indirect use values, and option values) and non-use values (include bequest values and existence values); to estimate the WTP to preserve & protect biodiversity in a protected area; to identify and assess potential financial benefits that can be generated from the area; to identify and value potential economic benefits to the local community, and to conduct CBA to assess the overall feasibility
Learning Outcomes	At the end of this module learners will be able to: • □Identify and assess the economic values of biodiversity (use and non-use values) • □Estimate the WTP to preserve & protect biodiversity • □Identify and assess potential financial benefits • □Identify and value potential economic benefits to the local community • □Conduct CBA • □Assess various policy options for biodiversity conservation
_____	Unit 1: Economic Values Unit 2: Contingent Valuation Method and WTP Unit 3: Costs and benefits

Units	identification and quantification Unit 4: CBA scenarios
Readings	• Case: Business Plan for protected areas management in Lebanon (Ministry of Environment report)
Activity	• Debate between ecologists and economists about developing an area or protecting it. • A spreadsheet problem can be used as a hypothetical example of two proposed uses for an area (development project vs. protected area). A set of costs and benefits is given for a 5-year period. The problem is set up so that the net present value changes from positive to negative with a change in the discount rate. This is a good illustration to show different CBA scenarios.