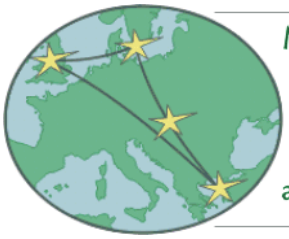

MESPOM
Masters in Environmental Sciences, Policy and Management

Supported by the European Commission's Erasmus Mundus Programme

Department of Environmental Sciences and Policy

Master of Science in Environmental Sciences and Policy (MESP)

Master of Science in Environmental Sciences, Policy and Management (MESPOM)

Description of Study Programmes

Academic Year 2015-2016

Budapest – September 2015

Contents

Dear student:

This document describes the MESPOM and MESP programmes in the CEU's Department of Environmental Sciences and Policy in the 2015-2016 Academic Year.

Every effort has been made to keep the information accurate as of the time of preparation (September 2015). However, in today's dynamic academic environment some changes are bound to occur. Whereas the staff and faculty will do their best to communicate these changes to the students and to keep the content of this document up-to-date, we would also be grateful for your notifying us about any inaccuracies.

Please note that supplements to this document will be introduced later in the year concerning Winter and Spring semesters.

The workloads indicated in the course descriptions are recommendations and projections for an average learner at the Masters' level. Likewise, if you find these grossly inaccurate, please advise faculty or staff.

Throughout the document, the following symbols are used in reading lists:

***R** – documents which will be supplied within the Course Reader;*
***E** – documents which can be obtained in electronic format (i.e. e-mails or recorded on a Flash Drive/Memory Stick) (normally from the Lecturer, Teaching Assistants or the Administrative Staff)*
***P** – documents which can be obtained in printed format for reading or photocopying (normally from the Lecturer, Teaching Assistants or the Administrative Staff)*
***L** – documents available at the CEU library (shelf codes are normally provided) [NB: if this symbol is absent it does not mean that the document is not available in the library]*

The usage of these symbols is optional. If you notice that some symbols are missing or misplaced, please notify us.

We are looking forward to working with and wish you a pleasant and exciting academic year!

Sincerely,

Faculty and Staff

Overview

Aim and objectives

The MESPOM and MESP Course prepare students for identifying, developing and implementing effective solutions to environmental challenges, especially in an international context. They aim to educate future decision-makers in businesses, government and other organizations. MESPOM and MESP offer comprehensive inter- and multi-disciplinary curricula in environmental studies that challenge students' ability to integrate theory and practice for systematic analysis, holistic understanding, and management of key environmental issues in various social contexts. MESPOM and MESP aim to provide skills for translating environmental knowledge into specific policy and management strategies. In addition to their academic work, students develop research, communication and other professional skills, learn to orient themselves in European and worldwide networks of environmental institutions and elaborate relevant career objectives and strategies.

Learning outcomes and acquired competencies

The learning outcomes of the programmes include knowledge and understanding of a range of environmental topics as well as intellectual, practical and transferable skills and competences, as detailed below. We aim to deliver *globally relevant* learning outcomes which will equip the graduates to work in various national and international contexts. We also aim to develop appreciation of the need for professionally ethical conduct and integrity.

At the end of the Masters programme, a successful graduate should be able to:

(KNOWLEDGE)

- thoroughly understand core concepts and approaches in environmental sciences, policy and management and their relationship to each other;
- demonstrate advanced understanding of several areas[1] of environmental sciences, policy and management (including awareness of the most important issues, contemporary theories and practices, key uncertainties, and practical complexities and dilemmas);
- understand the process of research and knowledge production in a selected environmental topic (including identifying a suitable problem statement and research questions, relevant academic and professional literature, and appropriate methods);

(SKILLS)

- analyze and critically evaluate contemporary theory and practice in a range of environmental fields;
- contribute to production of professional and academic knowledge and improvement of practice in selected fields of environmental science, policy and management;
- communicate complex environmental knowledge effectively in English both orally and in writing to professional and academic audiences, using appropriate communication standards;
- organize effective independent work in environmental sciences, policy and management;
- work effectively in multidisciplinary, multicultural groups to solve environmental problems;

(VALUES/ATTITUDES)

- appreciate the role and the value of rigorous scientific inquiry (including inter- and multi-disciplinary approaches), sound management practices, and democratic policy-making processes in solving environmental problems, with awareness of the role and the value of culturally appropriate approaches to environmental management in specific societal contexts;
- uphold values that advance a sustainable and open society, self-reflective critical inquiry, research ethics, and environmental and social care;

[1]For MESPOM students, these areas will include ecosystem management and either pollution and environmental control or preventative environmental strategies

- appreciate the potential contribution of multidisciplinary and/or multinational networks to meeting environmental and sustainability challenges.

Programme overview, timing and credit requirements

The 1st (Fall) Semester, "*Introduction to Environmental Sciences Policy, and Management*", comprises five modules with mandatory units. Its main objective is to "bridge" various initial competencies of the incoming students and equip them with skills necessary for further mastering environmental studies.

The 2nda (Winter) Semester contains elective and mandatory modules in environmental sciences, policy and management. The 2ndb (Spring) Semester includes thesis research for the MESP students and learning advanced Environmental Management topics for MESPOM students.

Table 1. Overview of the MESPOM and MESP study programmes in 2015/2016

Time	Module[a]	Courses (number of credits)
Semester 1 (Fall). Introduction to Environmental Sciences, Policy and Management		
Sept 14 – Dec 18	Course introduction (2)	**Balaton retreat; ICTs for Environmental Professionals; Transferable Skills and Faculty Lectures. (2)**
Sept 21 – Dec 18	Academic Writing (2)	**Academic writing (2)**
	Introduction to Envir. Sciences (7)	**Introduction to Quantitative Research Methods (1); Humans & the Biosphere (2); Non-Human Biosphere (2); Water Resources (2)**
	Introduction to Envir. Policy, Law & Thought (6)	**Introduction to International Environmental Policy (1.5); Introduction to International Environmental Law (1.5); Environmental Thought (1); Student Policy Conference (2)**
	Introduction to Envir. Management (6)	**Introduction to Environmental Assessment and Management (3); Introduction to Solid Waste Management and Introduction to Environmental Economics (3);**
Total for the 1st (Fall) Semester		**23 credits**

Semester 2a (Winter) **Elective Topics in Environmental Sciences, Policy and Management**		
Jan 11 – April 1 **To be updated**	Environmental Science **Min 9 credits** **Total credits offered:24**	Air Pollution & Climate Change (2); Biodiversity and Conservation (3); Environmental Monitoring$^{\Delta}$ (3); Freshwater Biodiversity Conservation$^{\Delta}$ (1); Water: Our sustainable use and provision of drinking water and sanitation (3); Marine Ecosystems (1); Oil and Metal Pollution (2); Spatial Analysis with ArcGIS (4); Environmental Modelling (3); Natural Resource use in the 21st Century: Prospects and Perspectives (2);
Jan 11 – April 1	Environment, Policy, and Society **Total credits offered: 25** Environmental Management A **Total credits offered: 12**	The Water, Food and Energy Nexus (4); Comparative and Sustainable Food Systems (2); Environmental Politics (4); Environmental Governance ‡ (4); Environmental Philosophy † (2); Policies for Sustainable Transport (2); Sustainable Development and Global Transition: from Paradigm to Practice (3); Environmental Practicum (2) Environment and Security (2); Products & Environment: Analytical Impact Assessment Methods* (3); Sustainable Energy Systems and Transitions (2); Energy Policy, Environment and Management (2) Environmental Assessment & Planning (3); Carbon Reporting: Theory and Practice (2)
	For Environment, Policy and Society AND Environmental Management A modules, minimum 12 credits for MESPOM; minimum 10 credits for MESP [Total credits offered: 37]	
Jan 11 – April 1	Environmental Research & Communication; **Min 3 credits for MESP students**	**Academic Writing for MSc Thesis§ (1); Interpretive Approach to In-Depth Interviewing§ (1); Social Research on Environmental Problems§ (1);** Thesis Research Seminar and Workshop (1)
Mar-April 11	**Exam for the Winter Semester**	
Total 2nd A (Winter) Semester	**22 credits (Maximum = 25 credits for Grade and Audit)**	
Semester 2b (Spring): Environmental Management B (MESPOM only)		
Apr 20 – Jun 21 **To be updated**	**Environmental Management B** **Min Credits: 14 for students who took ≥ 23 for Grade in Semester 2A; 15 for those who took 22 credits for grade in Semester 2A.**	**Assessment, Modeling and Scenarios for Ecosystems Management♦ * (6);** Sustainable Tourism* (2); Environmental Management in Industry** (4); Environmental Economic Instruments** (2); Industrial Waste Management & Pollution Control (3); Adaptive Management and Resilience of Socio-Ecological Systems (3); Professional Environmental Careers (1); Sustainable Energy Solutions (3); **Total credits offered: 24**
Thesis Research Period (MS only)		
Apr 8 – July 28	**16 credits**	
Total	**MESPOM: 23 + 22/23 + 15/14 = 60 credits** **MESP: 23 + 22 + 16 = 61 credits**	

Notes: Courses highlighted in bold are mandatory for all students; [a] in Semester 1 (Fall), the **modules** and in Semesters 2a and 2b – the **individual units** are the basis for grading and credit requirements

† Note that these courses run in parallel so students may only select one of the two (see Table 2).

‡ Note that these courses run in parallel so students may only select one of the two (see Table 2).

§ mandatory for all 1-year MESP students

* mandatory for all MESPOM students

** mandatory for MESPOM students on the Lund track

♦ hosted by the University of the Aegean

Δ course taught by visiting MESPOM scholar

Table 2. Courses, coordinators and instructors for 2014/2015

Course unit	Professor(s), coordinators	Course credits	Mandatory
Semester 1 (Fall Semester)			
Course Introduction	***A. Watt***	***2***	***YES***
ICTs for Environmental Professionals	V.Lagutov	2	***YES***
Academic Writing	***A.Watt***	***2***	***YES***
Introduction to Environmental Sciences	**R. Mnatsakanian**	***7***	***YES***
Humans & the Biosphere	R. Mnatsakanian,	2	***YES***
Non-Human Biosphere	B. Anthony	2	***YES***
Water Resources Management	D. Cogalniceanu	2	***YES***
Introduction to Quantitative Methods (I) OR Introduction to Quantitative Methods (II)	B. Anthony	1 1	Yes, unless granted course exemption
Introduction to Environment, Policy and Society	***A. Antypas***	***6***	***YES***
Introduction to Environmental Thought	A.Watt	1	***YES***
Introduction to International Environmental Policy	A.Antypas	1.5	***YES***
Introduction to International Environmental Law	S.Stec	1.5	***YES***
Student Policy Conference	A. Antypas (& others)	2	***YES***
Introduction to Environmental Management	***A.Cherp, Z.Illes***	***6***	***YES***
Introduction to Environmental Assessment and Management	A.Cherp	3	***YES***
Introduction to Environmental Economics & Introduction to Solid Waste Management	A.Cherp and Z.Illes	3	***YES***
Semester 2a (Winter)			
STREAM: ENVIRONMENTAL SCIENCE	***R. Mnatsakanian***	***24***	***Min 9 credits***
Air Pollution & Climate Change	R. Mnatsakanian, J. Karlik,	2	NO
Freshwater Biodiversity Conservation	R. Raghavan, B. Anthony	1	NO
Biodiversity & Conservation	B. Anthony	3	NO
Natural Resource use in the 21st Century: Prospects and Perspectives	R.Mnatsakanian	2	NO
Environmental Monitoring	B. Anthony, P. Ashley & T. Kovács	3	NO
Water: Our sustainable use and provision of drinking water and sanitation.	Z. Illes and E. Bellinger	3	NO
Marine Ecosystems	D. Cogalniceanu	1	NO
Oil & Metal Pollution	K. White	2	NO
Spatial Analysis with ArcGIS	V. Lagutov	4	NO: Can choose this course ***or The Water Food and Energy Nexus***
Environmental Modelling	V. Lagutov	3	NO: Can choose this course ***or The Water Food and Energy Nexus***
STREAM: ENVIRONMENT, POLICY AND SOCIETY	***A. Antypas***	***25***	

Course unit	Professor(s), coordinators	Course credits	Mandatory
The Water, Food and Energy Nexus	A. Antypas, L. Pinter	*3*	*NO; Can choose this course or Spatial Analysis with ArcGIS or Environmental Modelling*
Environmental Politics	T. Steger	4	NO
Environmental Governance	A.Antypas	4	NO
Environmental Practicum	V. Lagutov	2	NO; **This course does not count towards the minimum credit requirement**
Environmental Policy and Governance: Advanced Topics	A. Antypas	4	NO; Can choose this course ***or*** Energy Policy, Environment and Management
Environmental Philosophy	A. Watt	2	NO; Can choose this course ***or*** Carbon Reporting
Policies for Sustainable Transport	Z. Illes	2	NO
Sustainable Development and Global Transition: from Paradigm to Practice	L. Pinter	2	NO
Environment & Security	S. Stec	2	NO
Comparative and Sustainable Food Systems	P. Loring	2	NO
STREAM : ENVIRONMENTAL MANAGEMENT A	***A. Cherp***	***10***	
Products & Environment: Analytical Impact Assessment Methods	A. Plepys	3	**Mandatory for all MESPOM students**
Sustainable Energy Systems and Transitions	A. Cherp	2	NO
Energy Policy, Environment and Management	M. LaBelle	2	NO
Environmental Assessment and Planning	A. Cherp, M. Gachechiladze	3	NO
Carbon Reporting: Theory and Practice	R. Mnatskanian, E. Tsvetkova	2	NO
For *Environment, Policy, and Society and Environmental Management A* modules, minimum 12 credits for MESPOM and 10 for MESP students.			
STREAM: Environmental Research & Communication	***A. Watt***	***4***	**Min 3 credits for MESP**
Academic Writing for MSc Thesis	A. Watt	1	mandatory and only for 1-year MESP students
Interpretive Approach to In-Depth Interviewing	**T. Steger**	**1**	**mandatory for 1-year MESP students; optional for MESPOM**
Social Research on Environmental Problems	**T. Steger**	**1**	**mandatory for 1-year students; optional for MESPOM**

Course unit	Professor(s), coordinators	Course credits	Mandatory
Thesis Research Seminar and Workshop	**T.Steger**	**1**	**Optional for 1-year students and for 2nd year MESPOM students**
Semester 2b (Spring) MESPOM only			
Environmental Management B	***A. Cherp***	***25***	***Min 14-15 credits***
Assessment, Modeling and Scenarios for Ecosystems Management	**C.P. Halvadakis, D. Haralampopoulos, T. Akriotis, I. Spilanis, P. Gaganis, I. Botetzagias, K. Evaggelinos**	**6**	**YES**
Sustainable Tourism	**TBA**	**2**	
Environmental Management in Industry	P. Peck, T. Brorsson,N.Tojo, T. Lindhqvist	4	Yes, for those on Lund track
Environmental Economic Instruments	K. Farrell	2	Yes, for those on Lund track
Industrial Waste Management and Pollution Control	Z. Illes	3	NO
Adaptive management and resilience of socio-ecological systems	L. Pinter	3	NO
Professional Environmental Careers	A. Cherp	1	NO
Sustainable Energy Solutions	M. LaBelle	3	NO
Thesis Research Period (MESP only)			
MSc Thesis research, writing, and submission	varies	**16**	**YES**

Visiting faculty

Miklos Antal, Eötvös Loránd University

Dan Cogalniceanu, Faculty of Natural Sciences, University Ovidius Constanţa, Romania

Katharine Farrell, Institute of Environmental Science and Technology, Autonomous University of Barcelona, Spain

Jan Karlik, University of California, San Diego

Philip Peck, IIIEE, Lund University

Andrius Plepys, IIIEE, Lund University

Stephen Stec, Central European University

Naoko Toyo, IIIEE, Lund University

Keith White, University of Manchester, UK

Maia Gachechiladze, Ukraine

Philip Loring, University of Saskatchewan, Canada

MESPOM Scholars

Paul Ashley, Fleming College, Canada

Rajeev Raghavan, St. Albert's College, India

Descriptions of individual courses and modules
Semester 1 (Fall)

Academic Writing

Co-ordinator: Alan Watt, in collaboration with Center for Academic Writing [CAW] teachers Ágnes Toth and Eszter Timár

Credits: 2

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=4136

Aims, objectives and learning outcomes

To acquaint students with techniques for collecting and processing data, interpreting and presenting environmental information which they will need to use in the course of their masters studies. Emphasis is placed on practical knowledge, so students are given opportunities to try out the techniques in question on relevant examples and cases. At the end of this module a successful student should be able to understand and use standard techniques for written presentation of data, including referencing.

Educational activities, assessment and estimated workload

Learning outcomes	Assessment	Educational activities	Estimated workload (h)
Understanding of and ability to use standard techniques for written presentation of data	Class attendance and participation, class exercises, graded assignments (Course is pass/fail)	Lectures and seminars Short written assignments Reading assignments CAW seminars	12§ [2 optional] 22 16* [2 optional]
Overall total hours: ▪ In class activities (lectures and seminars) ▪ Self-study and independent work			**46-50** 24-28 22

Notes:

Underlined educational activities are scheduled.

* Students excelling in the pre-session writing test will be given an exemption from the CAW seminars.

§ The final mandatory class is only for one-year MSc students

Key Topics

With Alan Watt: documentation methods and related style issues; plagiarism and how to avoid it; writing scientific papers and presenting data; choosing an MS thesis topic [for 1-year students only]; tackling written examinations [optional class].

With Ágnes Toth/Eszter Timár: library skills; making decisions about style; structure in academic texts; the nature of research writing; report writing; effective use of sources; writing introductions and conclusions; writing titles and executive summaries [optional class]

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

ICTs for Environmental Professionals

Lecturers/Instructors: Viktor Lagutov, Lorant Czaran (UNOOSA) TBA

Credits: 2

Duration: Fall Click here to enter a date.

Pre-requisites: none

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=4141

Aims, Objectives and Learning Outcomes

Computer technologies become essential tools in interdisciplinary analysis of environmental problems and environmental decision-making. Information and Communication Technologies (ICTs) are widely used in environmental research and management including (but not limited to) data collection and storage, its analysis and visualization, assessment of management scenarios and presentation of findings. The range of available technologies, application areas and software packages is extremely wide and depends on issues concerned and level of computer literacy. The present course gives a brief introduction to some technologies focusing at spatial data visualization (mapping), data mining and processing, maps design for different purposes (internet, journal publications, etc). Several software packages and Internet technologies will be reviewed in order to build up students' interest and ability to apply these tools in both studies and further professional carrier. Primary attention will be paid to learning practical skills on mapping and data presentation.

Optional modules on various ICT related topics will be offered. The first module assists in building personal internet presence using different technologies. Other sessions can be devoted to essential PC skills (Internet, Word, Endnote, etc.) or other relevant issues requested by students.

The course is organized as a series of computer lab based presentations followed by practicals and individual student work on maps development.

Learning outcomes	Assessment	Activities	Estimated workload (h)
Learning about ICTs types and applicability to environmental areas	Class participation	Lectures	4
Getting familiar with Internet data search techniques and existing data sources	Class participation	Computer-based seminars	2
Knowledge of GIS, cartography and data visualization principles	Class participation	Lectures	4
Getting practical skills on map creation, data visualization and spatial geo-referencing	Exercise completion	Computer-based seminars led by instructors, step-by-step exercises	8
Getting familiar with online satellite imagery / their products and applicability to environmental area	Exercise completion	Computer-based seminars led by instructors, step-by-step exercises	2
Hands on experience with mapping software, various mapping related techniques and tools	Final assignment	Self-study, Library/ Internet search and reading	8
Experience on conducting independent data search and its processing for integrated assignment	Final assignment	Computer-based Individual work, consultations	6

Experience on independent maps development for integrated assignment	Final assignment	Computer-based Individual work, consultations	16
Total			**50**
Learning on modern Internet publishing trends and PC skills (optional)		Computer-based seminars, Individual work, tutorials and consultations	10

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Introduction to Environmental Sciences

Coordinator	Brandon Anthony
Credits	7
Lecturers	Ruben Mnatsakanian (Humans & the Biosphere, 2) Brandon Anthony (Non-Human Biosphere, 2) Dan Cogalniceanu (Water Resources, 2) Brandon Anthony (Introduction to Quantitative Research Methods, 1)

Course e-learning site:

NON-HUMAN BIOSPHERE: http://ceulearning.ceu.hu/course/view.php?id=4149

HUMANS AND THE BIOSPHERE: http://ceulearning.ceu.hu/course/view.php?id=4140

WATER RESOURCES: http://ceulearning.ceu.hu/course/view.php?id=4150

INTRO. TO QUANTITATIVE RESEARCH METHODS: http://ceulearning.ceu.hu/course/view.php?id=4144

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Aim, objectives and learning outcomes

The module aims to develop an understanding of the functioning of ecosystems and the environmental challenges which arise at the interface between them and human societies, including in particular the problems of serving global demands in energy and other natural resources.

At the end of the module a successful student should be able to:

1. Understand of basic concepts and laws of ecology; be aware of the main ecological theories; understanding ecological processes: the flow of energy, materials and information in ecosystems, ecological succession and evolution.
2. Understand the key concepts of environmental impact at different scales and associated ecological issues at global, regional and local levels;
3. Know the purpose and key elements of environmental indicator frameworks, the ways indicators and indices can be used;
4. Identify key environmental issues associated with agriculture and food security issues and human health;
5. Understand the importance and major environmental issues related to water resources availability and use.
6. Understand the main types of basic descriptive and inferential statistical analyses applied in environmental research and their specific tasks; to appreciate assumptions and limitations of the analyses, to be able to run these analyses in Excel and SPSS for Windows and to know how to interpret the outputs produced.

Educational activities, assessment and estimated workload

Learning outcomes	Assessment	Educational activities	Estimated workload (h)
NON-HUMAN BIOSPHERE			
Understanding of basic laws and concepts of ecology	Exam (40%) integrated 'science' assignment (60%)	Self E-Learning Lectures & films	8 16
Understanding of energy and material flows in ecosystems			

Learning outcomes	Assessment	Educational activities	Estimated workload (h)
Reciting key theories and facts contributing to modern ecological thought		Field trip (optional) Reading/Preparation for Assignment/Exam	4 22
Sub-total for Non-Human Biosphere (2 credits)			**50**
HUMANS AND THE BIOSPHERE			
Understanding key human-induced processes affecting the biosphere Understanding main factors of population dynamics and related consumption and environmental issues	Exam (40%) integrated 'science' assignment (60%)	Lectures Reading	16 16
Ability to work with environmental indicators and knowledge of main indicator frameworks		Lectures Reading	4 6
Identify key environmental issues associated with agriculture		Lectures Reading	4 6
Sub-total for Humans & the Biosphere (2 credits)			**52**
		In-class activities (lectures, seminars,)	24
		Self-study and independent work (reading)	28
WATER RESOURCES			
Understanding of basic facts and concepts of global hydrological cycle, water needs and water availability	Exam (100%)	Lectures Reading	4 6
Comprehension of main environmental challenges associated with various uses of water		Lectures Reading	6 8
Solving the conflicting management goals related to water resources management		Lectures Reading	6 8
Sub-total for Water Resources (2 credits)			**50**
		Individual consultations (optional)	4
		In-class activities (lectures and seminars)	16
		Self-study and independent work (reading + exam prep)	30
INTRODUCTION TO QUANTITATIVE RESEARCH METHODS			

Learning outcomes	Assessment	Educational activities	Estimated workload (h)
Acquire practical knowledge and basic understanding of the main types of basic descriptive and inferential analyses applied in environmental research.	pass/fail based on attendance in course	Lectures/Excel & SPSS practicals Reading/Self -study	12 8
Subtotal for Quantitative Research Methods (1 credit)			**20**
Total for Introduction to Environmental Sciences (7 credits)			**172**

Notes: Underlined educational activities are scheduled

* Students with an academic background in statistics/quantitative methods may apply for an exemption to this course. All students must take a pre-test for this course, which will consist of a multiple-choice exam. Students passing with a minimum grade of 70% will be exempt from the course although they are still welcome to attend any component of the course. Remaining students will be broken into two groups (I, II) based on their pre-test scores, with differentiated course material.

Key Topics

The Non-Human Biosphere

PART I: LIFE AND THE PHYSICAL ENVIRONMENT
- Introduction
- The Physical Environment
- Adaptation to Aquatic and Terrestrial Environments
- Variations in the Physical Environment

PART II: ECOSYSTEMS
- Energy in the Ecosystem
- Pathways of Elements in the Ecosystem

PART III: ORGANISMS
- Sex and Evolution

PART IV: POPULATION ECOLOGY
- Population Structure
- Population Growth and Regulation

PART V: SPECIES INTERACTIONS
- Predation and Herbivory
- Dynamics of Predation
- Competition
- Co-evolution and Mutualism

PART VI: COMMUNITIES
- Community Structure
- Community Development

PART VII: ECOLOGICAL APPLICATIONS
- Biodiversity & its Loss

Humans and the Biosphere

- Population explosion in the XX century. Reasons and causes of this explosion. Demographic transition. Links between demographic explosion and social, political and environmental problems;

- Environmental indicators. Pressure-State-Response scheme and its modifications. Use of indicators for description of various environmental issues. Consumption and technology factors;
- Atmospheric Transformations. Atmospheric Lifetime and Fates of Airborne Chemicals. Peculiarities of air pollution at different scales;
- Local issues: problems associated with urban air pollution, major types of urban pollutants, Health effects of urban air pollution;
- Regional issues: acid deposition, problems associated with acidification in Europe, ways to diminish acidic loads on the environment;
- Global issues: evidence of current climate change and stratospheric ozone depletion, climate change in the past, possible environmental consequences of changes in atmosphere at the global level;
- Ways to meet the challenge of atmospheric pollution: existing international agreements and their implementation, current negotiations and debates on new agreements;
- Studying and constructing possible future scenarios (based on group exercise with the "World 3" model)
- Key environmental and social issues associated with agriculture and food security;

Water Resources

- Unique physico-chemical properties of water.
- Current state of global fresh water resources. Main elements of hydrological cycle.
- Water in the environment, its uneven distribution and availability in time and space.
- Human needs and uses of water both for personal use and within economic systems.
- Agricultural water use in Europe and world-wide as a major consumer of water resources. Water as a major component of food security.
- Direct human impacts on freshwater: overuse, pollution, eutrophication, wetland destruction, navigation and irrigation systems.
- Environmental consequences of dam construction.
- Management of water resources. The river basin approach.

Introduction to Quantitative Research Methods (I) and (II)

Lecturers/Instructors: Brandon Anthony

Credits: 1 (mandatory; pass/fail)

Duration: 9/28/2015 to 10/16/2015

Pre-requisites: *** All students must take a pre-test for this course, which will consist of a multiple-choice exam. Students passing with ≥70% will be exempt from the course. Remaining students will be broken into 2 groups (I, II) with differentiated course material.**

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=4144

Aims, Objectives and Learning Outcomes

The aim of this course is to prepare students to choose the most appropriate quantitative (statistical) method and effectively apply it to answer a research question. The objectives are: to understand the basic descriptive and inferential statistical analyses applied in environmental

research; to appreciate assumptions and limitations of the analyses, to be able to run these analyses in Excel and SPSS for Windows and to know how to interpret the outputs produced.

At the end of this unit a successful student should:

Knowledge and understanding	· Have practical knowledge and basic understanding of the scientific method, and main types of basic descriptive and inferential statistics applied in environmental research.
Intellectual skills	· Be able to choose the most appropriate quantitative method to address a research question. · Be able to read documents/papers that contain basic descriptive and inferential statistics knowledgeably.
Practical skills	· Be able to perform basic descriptive and inferential data analyses using Excel and SPSS, interpret the result and translate that back into the words of an environmental research issue.
Transferable skills and personal qualities	· Learn to ask appropriate questions about a problem, design experiments or sampling programmes optimally and effectively communicate environmental research results.

Learning Outcome	**Assessment**	**Activities**	**Estimated Workload**
Acquire practical knowledge and basic understanding of the main types of basic descriptive and inferential analyses applied in environmental research.	pass/fail based on attendance in course	Lectures/Excel & SPSS practicals Reading/Self - study	12 8
Total			20

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Introduction to Environment, Policy and Society

Coordinator: Alexios Antypas
Credits: 6
Lecturers/instructors: Alexios Antypas, (Introduction to International Environmental Policy,1.5; Student Policy Conference, 2)
Stephen Stec (Introduction to International Environmental Law,1.5)
Alan Watt (Introduction to Environmental Thought, 1)

Aims, objectives and learning outcomes

This module will familiarize students with the basic institutions, processes and functions of international environmental governance, including policy and law, and with the foundations of environmental thought.

At the end of this module a successful student should be able to

1. Understand the origins, the position, the logic and key concepts of international law and international environmental law, and the evolution and structure of the international law of sustainable development;
2. Be familiar with the structures and processes of international environmental governance, including the system of international organizations and multilateral environmental agreements;
3. Analyze international environmental governance in the context of global governance;
4. Identify and suggest policy alternatives and institutional reforms for more effective environmental governance at the international level
5. Understand key developments in the history of environmental thought from the ancient Greeks to the present day.
6. Critically analyze the controversies of the philosophical underpinnings of environmentalism and environmental policies;
7. Understand, compare and contrast the different intellectual strands of modern environmentalism, including understanding their historical origins;
8. Be competent in preparing and delivering a professional quality academic conference presentation.

Educational activities, assessment and estimated workload

Learning outcomes	Assessment	Educational activities	Estimated workload
INTERNATIONAL ENVIRONMENTAL POLICY			
Understand key concepts and institutional structures of international environmental policy Be familiar with policy alternatives and institutional reforms for more effective environmental governance at the international level	exam (100%)	Lectures Readings	12 23

Learning outcomes	Assessment	Educational activities	Estimated workload
Sub-total for International Environmental Policy (1.5 credits), including:			**35**
		In-class activities (lectures and seminars)	12
		Self-study and independent work (reading)	23
INTERNATIONAL ENVIRONMENTAL LAW			
Understand the origins, the position, the logic and key concepts of international law and international environmental law, and the evolution and structure of the international law of sustainable development. Be familiar with the structures and processes of international environmental governance, including the system of international organizations and multilateral environmental agreements.	exam (80%) attendance & participation (20%)	<u>Lectures and Discussion</u> Reading assignment work	12 18 3
Sub-total for International Environmental Law (1.5 credits), including:			**33**
		In-class activities (lectures and seminars)	12
		Self-study and independent work (reading)	21
ENVIRONMENTAL THOUGHT			
Understand key developments in the history of environmental attitudes and thought from the ancient Greeks to the present day. Understand and critically examine key intellectual challenges to environmentalism. Understand, compare and contrast the different intellectual strands of modern environmentalism.	Exam (100%)	<u>Lectures</u> <u>Class debate</u> Reading, debate preparation (optional tutorial)	6 2 13 (1)

Learning outcomes	Assessment	Educational activities	Estimated workload
Sub- Total for Environmental Thought (1 credit), including:			**21-22**
		Contact-hours (lectures and seminars, tutorial)	8-9
		Self-study and independent work (reading)	13
Exam revision (4 hours per credit)			16
Total for Introduction to Environment, Policy and Society (with Student Policy Conference-see below) (6 credits)			**156**

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Introduction to International Environmental Policy

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=4146

The politics of the environment have become prominent and often highly contentious in international relations over the past roughly thirty years. Until the 1980s, most governments of developed countries considered environmental issues marginal and apolitical. At the same time, the governments of developing countries mainly considered environmental issues marginal but highly political, in the sense that they viewed the environmental agenda as a neo-colonial imposition by Western countries bent on controlling their economies and limiting competition through expensive environmental standards. Neither view has survived the intervening years fully intact, although a deep divide between states over how to manage the global environment continues, often, to run along the so-called North-South border.

In spite of profound difficulties of achieving agreement over an international environmental agenda, and the inextricable linkages and contradictory aims of the international development and economic agendas and the environmental agenda, a very complex and rapidly evolving global environmental governance system has emerged. Moreover, cooperation over the environment has become more of the norm than the exception. The simple North-South dichotomy that described much of the international politics of the environment in the 1970s and early 1980s has now been replaced by a multi-faceted and protean system of state-based coalitions and transnational networks of non-state actors that coalesce and dissolve over specific issues and environmental regimes.

Expected Hours

Lectures and discussion: 12

Reading: 23

Total: 35

Introduction to International Environmental Law

Lecturers/Instructors: Stephen Stec

Credits: 1.5

Duration: 10/30/2015 to 11/13/2015

Pre-requisites: none

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=4145

Aims, Objectives and Learning Outcomes

This course provides a basic introduction to international law as a mechanism for establishing and maintaining environmental quality, and the international legal process of developing norms for sustainable development. The course looks at environmental challenges from the legal and governance perspective and provides a foundation in the relevant core concepts, actors, drivers and institutions, as well as legal instrumentalities such as multilateral environmental agreements (MEAs) and "soft law"- from origins in nature protection to the relatively recent concept of sustainable development. Particular agreements are examined to see how they contribute to regime formation and relate to sustainable development goals, and how states implement and enforce them to achieve compliance. Students will also examine how international and domestic jurisprudence shapes environmental law and the law of sustainable development. Domestic and international legal remedies may be examined, time permitting.

Learning Outcome	Assessment	Activities	Estimated Workload
Understand international law as a mechanism for achieving sustainable development and environmental protection	Exam (80%) Group/individual work (20%)	Group/individual assisgnment Exam	11
Understand the relationship of law to international relations and institutional frameworks	Exam (80%) Participation (20%)	Lectures and reading and exam	11
Understand how jurisprudence shapes international law	Exam (80%) Participation (20%)	Lectures and reading and exam	11
Total hours			33

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Environmental Thought

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=4139

Historical sources and origins of environmentalism (religion, philosophy, science); challenges to environmentalism and "anti-environmental" ideas; key modern environmentalist thinkers and milestones in the development of environmental thought; rival discourses about the environment; democratic versus technocratic approaches to environmentalism (debate).

Student Conference: The Intersection of Crisis and Transition

(2 credits)

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=4148

Conference theme:

The theme of this year's conference is "The Intersection of Crisis and Transition." Crisis and transition appear at themes throughout the environmental discourse, and can even be thought of as sometimes being in opposition to each other, or at opposite ends of a spectrum. Crises are thought to be immediate and urgent, and sometimes brief in duration. From oil spills to the rapid loss of rainforest, crises draw out attention because they unfold in front of our eyes and many of their effects can be immediately seen and anticipated. Transitions are thought to occur more slowly, over longer periods of time, and without the drama of crises. Environmentalists have long grappled with the fact that crisis management alone cannot solve our environmental problems, even if crises take up a great deal of the attention that the public pays to environmental issue.

Presentation topics:

Your topics should fit broadly into the "crisis and transition" theme. You can focus exclusively on crisis or transition, or address both. Your topic should be policy, law, and/or thought/philosophy oriented. Science, while essential in understanding environmental problems, should take a back seat for this conference.

Faculty mentors:

The faculty mentoring component of this conference is an essential new addition to the conference structure. Each student will be matched with a faculty mentor, who will help the student reach the key milestones in this process: writing a high quality abstract, producing a high quality presentation, and delivering it in a professional manner. An additional outcome of this course will be for students to enhance their ability to apply theoretical frameworks to analyze environmental policy issues. How interactions are scheduled and conducted between students and mentors will be up to the students and mentors individually. Faculty members currently available as mentors will be:

Guntra Aistra / Alexios Antypas / Aleh Cherp / Michael LaBelle/ Ruben Mnatsakanian / Laszlo Pinter / Stephen Stec /

Tamara Steger / Alan Watt

Expected hours:

Abstract preparation: 3

Research and consultation with faculty mentors: 35

Preparing slides: 5

Presentation and conference participation: 7

Assessment:

Meeting deadlines: 10%

Abstract quality: 20%

Two page summary: 30%

Presentation: 40%

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Introduction to Environmental Management

Coordinator	Aleh Cherp
Credits	6
Lecturers	Aleh Cherp, Introduction to Environmental Assessment and Management Aleh Cherp, Introduction to Environmental Economics, Zoltan Illes, Introduction to Solid Waste Management,

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Aims, objectives and learning outcomes

The aim for this module is to prepare the students to systematically think about and work towards formulating and achieving environmental concrete environmental objectives in the world of scarce resources and competing agendas. A successful student completing this model should be able to:

1. Know the purpose and key elements of environmental impact assessment (EIA) as well as principles of other types of environmental assessments.
2. Understand the basic principles of environmental management systems in their relation to environmental and sustainability strategies and to broader management concepts.
3. Appreciate the challenges involved in managing people in various organizations and contexts.
4. Understand general principles of economic analysis and appreciate how these basic principles are related to specific areas of environmental economics.
5. Read and assess the quality of environmental economics analyses and associated policy recommendations.
6. Understand the key impacts associated with waste management as well as key principles of integrated waste management.
7. Understand the key energy concepts, terms and units.
8. Know key facts related to global energy challenges (including environmental impacts of unsustainable energy production and consumption);
9. Understand the key aspects of main technologies for the transformation and utilization of energy and the potential for their future development.

Educational activities, assessment and estimated workload

Learning outcomes	Assessment	Educational activities	Estimated workload
INTRODUCTION TO ENVIRONMENTAL ASSESSMENT & MANAGEMENT			
1-3 from above	Exam (80%) Participation in class and group exercise, including students' blogging (20%)	Lectures and seminars (scheduled class time)	12
		Group work and mentoring sessions	25
		Reading and exam review	30
Subtotal for Introduction environmental assessment and management, including:			**64**
INTRODUCTION TO ENVIRONMENTAL ECONOMICS			
		Lectures	12

Learning outcomes	Assessment	Educational activities	Estimated workload
4-5 from above	Class participation (20%) Exam (80%)	Group exercise Reading and assignment preparation	30 22
Subtotal for Environmental Economics			**64**
INTRODUCTION TO SOLID WASTE MANAGEMENT			
Understanding of integrated waste management	Participation in class discussions (pass/fail)	Lectures and seminars Field trip Reading and preparing for class discussion	6 8 8
Subtotal for Introduction to Solid Waste Management			**22**
Total for Introduction to Environmental Management (6 credits)			**150**

Introduction to Environmental Assessment (EA) and Management

This component of the course will contain a pre-test run through the e-learning site. The instructions will be sent separately.

Introduction to the idea of management. Management mindsets: approaches to framing and resolving problems at the interface of the environment and human activities.

The importance of analysis and planning for management. The nature of EA, legal frameworks for EIA and SEA. Stages and elements of the project-level EIA: screening, scoping, impact prediction and evaluation, quality control and decision-making, post-project analysis, consultation and public participation. Integrating environmental assessment with other assessments and sustainability assessment. The basic principles of Environmental Management Systems (EMS)

Dealing with complexities, uncertainties, innovation, and diversity of perceptions and perspectives interests in environmental management.

Management strategies. What is a strategy and how it may be conceived and implemented?

Introduction to Environmental Economics

This course is designed to provide students with a basic knowledge of the general fields of Ecological and Environmental Economics, with a focus on their contribution to design and implementation of environmental policy. The teaching for this course is divided into three learning steps: (1) Basic Principles of Economic Analysis; (2) Environmental Economics and Decision Making; and (3) Values and Valuation of the Economic Worth of the Environment.

Topic 1. Economic thinking and economic choice

Topic 2. Cost-benefit analysis

Topic 3. Supply and Demand

Topic 4. Capital

Topic 5. Macroeconomics

Introduction to Solid Waste Management

Major policy choices related to waste management. The concept of integrated waste management, which relies on a combination of approaches, planning, economic instruments and public participation to reduce environmental, social and economic impacts of the growing volume of waste produced in our cities.

- Municipal solid waste (MSW) management dilemma: the downward spiral of environmental, social and economic problems.

- MSW management approaches: landfilling and incineration.
- MSW management approaches: recycling, composting, waste minimization
- Planning and implementing an integrated MSW management strategy.

Descriptions of individual courses and modules
Semester 2A (Winter)

Environmental Science

Stream coordinator: R.Mnatsakanian

Air Pollution and Climate Change

Lecturers/Instructors: Ruben Mnatsakanian and John Karlik

Credits: 2 (elective)

Duration: 1/14/20151/14/2015 To 1/22/20151/22/2015

Pre-requisites: none

Course e-learning site: http://ceulearning.eu.hu/course/view.php?id=2970

Aims, objectives and learning outcomes

The aim of this course is to develop a foundational understanding of atmospheric science, including the nature of air pollution problems on local, regional, continental, and global scales, and the development of air quality regulation. Emphasis will be placed on the fundamental chemical and physical processes operative in the atmosphere, the influence of human activities, and the processes by which air quality regulations and policies are developed. An introduction to air pollution modelling will be made, with the description of major existing types of models and existing policy frameworks based on modelling. Introduction to paleo-climatology will be made with the emphasis on methods of study of past climates. Students will have group assignment based on real data of air pollution in Budapest and report their findings.

Educational activities, assessment and estimated workload (units of hours)

Learning outcomes	Assessment	Educational activities	Estimated workload
Understand key concepts and institutional structures of atmospheric science and regulation Understand basics of modelling used for air pollution assessments and policy-making Understand how lacustrine sediments can be used to trace atmospheric processes Being able to work with primary air pollution statistics, prepare group report Total hours	Written exam Evaluation of written assignment Evaluation of presentation	**Lectures** Reading Group Assignment Report on findings	16 10-12 12 2 40-42

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Biodiversity and Conservation

Lecturers/Instructors: Brandon Anthony

Credits: 3 (elective)

Duration: 1/5/20151/5/2015 To 3/1/20153/1/2015

Pre-requisites: none

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=2971

Aims, Objectives and Learning Outcomes

This course focuses on biodiversity loss and the importance of conservation. Students will survey patterns of global diversity and learn the most pressing threats leading to declines in biodiversity. Students will be introduced to the theory and principles involved in conservation and learn about governmental and non-governmental efforts to protect biodiversity and develop sustainable practices to meet human needs. In addition, there will be a natural history film, guest speakers, and a ½ day field trip to the Budapest Zoo to view *ex-situ* conservation in practice.

Learning Outcome		**Assessment**	**Activities**	**Est. Work-load**
Foundational Knowledge	1. understand biodiversity and its value; 2. understand current threats to biodiversity; 3. recall basic conservation practices; 4. legislation and initiatives in EU and globally; 5. understand principles protected areas; 6. understand opportunities and challenges surrounding community-based conservation;	Assn 1 LOs 1,5,8,10,11 40%	Lectures/ Exercises/ Films	26
Application	7. analyze options for biodiversity conservation; 8. measure and compare levels of biodiversity; 9. utilize the IUCN Species Red List;	Assn 2 LOs 1-7,11-13,14,16,17 60%	Field Trip	4
Integration	10. prioritize sites for conservation; 11.evaluate conservation trade-offs;		Reading	20
Human Dimension	12. understand personal and social implications of conserving biodiversity;		Assignment 1	12
Caring	13. develop a deeper concern and appreciation for biodiversity and its conservation; 14. articulate own conservation philosophy; 15. appreciate other conservation philosophies; 16. improve group-working skills.		Assignment 2	13
Learning How to Learn	17. continue learning re conservation; 18. critically engage in conservation debates.			
Total hours Click here to enter text.				75

Freshwater Biodiversity Conservation

Lecturers/Instructors: Rajeev Raghavan (St. Albert's College), Brandon Anthony

Credits: 1 (elective)

Duration: 2/15/2015 To 3/15/2015

Pre-requisites: none

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3434

Aims, Objectives and Learning Outcomes

The course will focus on the significance of, need, and strategies for conserving global freshwater biodiversity. In this course, the students will be introduced to the diversity, distribution and value of freshwater taxa; current status of freshwater biodiversity globally with specific case studies from Asia and Africa; the status of global inland fisheries in the context of integrative fisheries science; local, national and international policies relevant to freshwater biodiversity; conservation tools and strategies for freshwater biodiversity. In addition, emerging conservation issues related to freshwater biodiversity will be discussed. The first one will examine the biological, socio-economic and conservation impacts of freshwater aquarium fish trade; and the second will focus on the benefits and risks of freshwater recreational fisheries, especially those relating to endangered species.

Learning Outcome	Assessment	Activities	Estimated Workload
1. **General introduction to freshwater biodiversity**: major freshwater taxa and their distribution; global freshwater eco-regions; value of freshwater biodiversity; freshwater ecosystem services; inland fisheries and aquaculture. 2. **Threats to freshwater biodiversity**: pollution; habitat loss; impact of dams and flow modification; overharvest; invasive alien species; climate change; case studies 3. **Conservation strategies in freshwater ecosystems**: awareness, education and community management; freshwater protected areas; freshwater Key Biodiversity Areas; managing fisheries in inland waters; conservation marketing and the role of flagships; role of religion and beliefs in freshwater conservation science 4. **Freshwater policies and legislation**: local, regional and international laws and legislations; CBD and Aichi Targets; CITES, CMS, RAMSAR; role and application of the IUCN Red List of Threatened Species™ in freshwater systems; freshwater biodiversity and the IUCN Red List of Ecosystems™ 5. **Case studies**: Extractive ornamental fisheries and trade from the world's biodiversity hotspots ; Recreational fishing for endangered species - benefits and risks	2 written essays	lectures reading assignments	8 9 8
Total hours 25			25

Environmental Monitoring

Lecturers/Instructors: Brandon Anthony, Paul Ashley (Fleming College/Parks Canada), Tibor Kovács (BirdLife Hungary)

Credits: 3 (elective)

Duration: 3/30/20153/30/2015 To 4/3/20154/3/2015

Pre-requisites: none

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=2970

Aims, Objectives and Learning Outcomes

This course will introduce students to broad principles within the field of environmental monitoring followed by lectures using case studies to discuss principles of contaminant monitoring, use of bioindicators, and building partnerships using community-based monitoring. We will discuss how these methods may be used to monitor amphibian populations and their habitats. The field component will focus on the use of amphibians as bio-indicators of the integrity of freshwater habitats in the Pilis Hills and near Lake Balaton. On-site habitat assessments will be complemented by quantitative field work using visual encounter surveys and the amphibian road call count method.

Learning Outcome	Assessment	Activities	Estimated Workload
1. understand the basic principles of environmental monitoring 2. identify the pros and cons of various approaches to monitoring the environment 3. be aware of common bioindicators and how they are used 4. understand the concepts in effective study design and apply them to a monitoring question of concern 5. conduct a simple amphibian monitoring study 6. present findings in a clear and concise fashion 7. work more effectively in a group setting 8. improve ethical conduct whilst undertaking field research	group reports (90%) group self-assessment (5%) ethical conduct during field work (5%)	lectures field exercise reading / listening to audial recordings group report writing	12 24 16 23
Total hours Click here to enter text.			75

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Water: Our sustainable use and provision of drinking water and sanitation

Lecturers/Instructors: Ed Bellinger and Zoltan Illes

Credits: 2+ 1= 3 (Required for the "Marine Ecosystems" component)

Duration: Winter 2a Click here to enter a date.

Pre-requisites: none

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3452

Aims, Objectives and Learning Outcomes

Water is vital for all life on this planet. It has several unique properties to which life is adjusted and that also affect its behaviour and our use of it. From the point of view of human populations, personal, agricultural, industrial and economic demands make water availability and limiting factor in human development. As fresh water is not necessarily in abundant supply we must develop a sustainable approach to our use.

Learning Outcome	Assessment	Activities	Estimated Workload
• How to ensure water quality • Learn the process for waste water treatment and drinking water • Develop a greater understanding of water economics • How water is a regulated commodity	Written Exam	Lectures Consultation Self-study (reading) Exam preparation Field trip	26 8 22 10 8
Total hours 47			74

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Marine Ecosystems

Lecturers/Instructors: Cogălniceanu Dan

Credits: 1

Duration: Click here to enter a date. To Click here to enter a date.

Pre-requisites: None

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3411

Aims, Objectives and Learning Outcomes

1. Understand the importance of marine systems, their diverse structure and functions, and the complex links between land and the ocean.
2. Acknowledge the major role the ocean plays in the proper functioning of the ecosphere as the life-support system and of the goods and services provided by the oceans, especially climate-regulation.
3. Present the main threats affecting the oceans, the coastal areas and enclosed seas. The focus will be on the over-exploitation of fish stocks and the ecological effects and economic costs involved, and on the introduction of alien species.
4. As study case analyze the uniqueness of the Black Sea and its links with the Danube River catchment. Understand how the river, delta and marine basin function as a single geosystem.
5. Present the main conceptual developments in marine sciences, progresses in legislation and conservation, the current sustainable marine resources management practices, and the increasing importance of marine protected areas.

Learning Outcome	Assessment	Activities	Estimated Workload
Knowledge and understanding: Gain an understanding on the complexity of marine systems and of their importance. Become familiar with the main threats and environmental issues related to marine systems. Understand recent political approaches to the management of marine systems. Become aware of the specific problems and issues related to European enclosed seas. **Intellectual skills:** Evaluate policy options available for addressing marine related issues. **Practical skills:** Be able to evaluate the usefulness and quality of the present environmental solutions for marine systems. Understand the complex links between terrestrial and marine ecosystems and how human activities on land impact the marine environment.	Essay – 100%	Lectures Readings	10 10
Total hours 20			20

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Oil and Metal Pollution

Lecturers/Instructors: Keith White

Credits: Two credits, 48 hours

Duration: 1/12/20151/12/2015 to 1/21/20151/21/2015

Pre-requisites: None

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3428

Aims, Objectives and Learning Outcomes

Metals are major pollutants of all sectors of the environment while our demand for oil results in severe environmental impacts as pollution of the Gulf of Mexico in 2010 can attest. The threat posed by mercury, cadmium and organotin compounds plus oil means that they are classed as Black/Red List or List 1 substances considered to be 'the most dangerous due to their toxicity, persistence or bioaccumulation in the environment'.

Amount of either pollutant is unlikely to decrease in future. Demand for oil will remain high and huge quantities are transported by sea and pipelines while refining, storage and use pose environmental risks. Modern technologies allow extraction from depth and inhospitable regions plus the extraction ('fracking') of 'tight oil' from previously un-exploitable reserves. Trace metal pollution continues to result in environmental damage on a regional scale. Toxic metals such are central to modern industry such as electronics. The introduction of novel applications for metals such as in nanotechnologies poses further environmental challenges and potential threats.

To be able to anticipate and manage the risks to the environment from oil and metals as well as controlling and reducing their use requires a knowledge and understanding of extraction, refining and use. It is also important to know how oil and metals behave in the environment as lack of such understanding has been a key factor in increasing the degree of environmental damage. Reducing environmental impacts require an understanding of the role of regulation in reducing accidental and illegal release plus methods and approaches to clean-up. Minimizing impacts also involves the use of remediation technologies, including the challenge of dealing with the legacy of past pollution when environmental regulation was much weaker.

Therefore the **first aim** is to provide an understanding of sources, behaviour, fate and impact of trace metals and oil pollutants. The **second aim** is to examine the efficacy and environmental impact of strategies and methods of preventing pollution of waters and land by trace metals and oil, and clean up should pollution occur.

Learning Outcome	Assessment	Activities	Estimated Workload
1. Sources of trace metal & oil pollution of water & land.	Examination	Lecture	4
2. Characteristics & behaviour in water of oil and metals & how influences environmental impact	Examination	Lectures & tutorials	6
3. Impact of selected trace metals on land & water	Examination & assignent	Lectures & tutorials	8
4. Impact of oil on terrestrial, marine & freshwater ecosystems, fisheries & recreation	Examination	Lectures & tutorials	6
5. Understand the need and demand for metals and oil by modern society	Examination	Lectures & tutorials	8
6. An understanding of efficacy of methods to reduce or prevent entry of trace metals & oil to the environment	Examination & assignment	Lectures & workshop	10
7. An awareness of methods & environmental impact of removing trace metals or oil released to marine & freshwaters & decontamination of soil	Examination & assignment	Lectures & workshop	6
Total hours Click here to enter text.			48

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Spatial Analysis with ArcGIS

Lecturers/Instructors: Viktor Lagutov, Lorant Czaran (UNOOSA), invited guest speakers

Credits: 4

Duration: 11 weeks. From January To March

Pre-requisites: ICTs for Environmental Professionals

Course e-learning site: http://ceulearning.ceu.hu

Aims, Objectives and Learning Outcomes

The overall aim of the course is to develop basic understanding of spatially referenced data analysis and to explore the potential of GIS applications in environmental sciences, policy and management. In this course students will 1) continue working on geospatial mapping and 2) get familiar with spatial analysis using commercial and free software packages. The course offers more detailed discussion of geospatial data visualization and introduces quantitative analysis of geospatial phenomena. An introduction to remote sensing satellite methods based is also given.

Learning outcomes	Assessment	Educational activities	Estimated workload, h
Theory of GIS and spatial analysis	Class participation and home works	Laboratory-based lectures, Readings	14 14
Best practices and case studies in environmental GIS application	Class participation	Guest lectures and consultations	5
Practical skills in using GIS packages	Class participation and home works	Laboratory-based lectures and seminars, Practical in-class exercises; Individual work	15 10
Practical skills in retrieving and manipulating spatially referenced environmental data	Class participation and home works	Practical in-class exercises; Individual work	12
Ability to carry out independent GIS-based research	Public presentation of the individual project	Individual consultations and project work; readings; data mining	30
Total hours			100

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Environmental Modelling

Lecturers/Instructors: Viktor Lagutov, TBC

Credits: 3

Duration: 1/13/2014 3/30/2014

Pre-requisites: This course builds on student's own environmental background and some basic mathematical skills. No prior training in math is required.

Course e-learning site: http://ceulearning.ceu.hu

Aims, Objectives and Learning Outcomes

The aim of the course is to introduce the idea, methodology and basic tools of environmental modeling. Models are important tools in environmental studies and management nowadays. In order to better understand environmental systems, to predict their behaviour and to develop effective management strategies it is necessary to bring together ecological, socio-economic and technological aspects of environmental problems. Modeling enables such an interdisciplinary analysis by both quantitative and qualitative techniques. Modeling is also used to stimulate consensus-building among various experts/stakeholders and to communicate scientific results to decision-makers in explicit and comprehendible manner. Different modelling approaches will be discussed during the course. The primary attention will be given to process-based simulation and system dynamics as well as scenario development and analysis.

By the end of the course students should :

· understand the role of modeling in environmental sciences and management, it's advantages and limitations;
· be familiar with main principles and approaches to modeling of environmental systems;
· be able to develop a process-based environmental model using STELLA package.

Learning outcomes	Assessment	Educational activities	Estimated workload, h
Introduction to environmental modelling	Class participation; Exercises	laboratory-based lectures, discussions; readings	6
Modelling case studies	Class participation	discussions	4
Introduction to STELLA software package	Class participation; Exercises	laboratory-based lectures	15
Practical modeling skills	Project presentation	In-class exercises and tutorials, Homeworks, Individual work on modelling project and consultations	35
Familiarity with modelling case studies and their critical assessment	Participation in project presentation and assessment	Individual project presentation and critical assessment, readings	15
Total hours			75

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Natural Resource Use in the 21st Century: Prospects and perspectives

Lecturers/Instructors: Ruben Mnatsakanian

Credits: 2

Duration: 1/12/2015 To 3/2/2015

Pre-requisites: None

Course e-learning site: insert link here. The full syllabus should be posted there too

Aims, Objectives and Learning Outcomes

The course's main aim is to provide students with an understanding of:

- The role of particular resource for human well-being,
- Existing methods of evaluation and assessment of availability of different types of resources
- Environmental consequences of usage of different types of resources

Learning Outcome	Assessment	Activities	Estimated Workload
• Understand current availability of major natural resources • Understand links between soil use, climate change and negative environmental consequences • Understand the role of recycling and resource use for modern industry	Written assignment 80% Presentation 20%	Lectures and seminars Group presentations Assignment Reading	12 4 16 16
Total hours Click here to enter text.			48

Environment, Policy and Society

Stream Coordinator: Alex Antypas

The Water, Food and Energy Nexus

Lecturers/Instructors: Alex Antypas, Laszlo Pinter, Marta Vetier (TA)

Credits: 4

Duration: 1/13/2015 To 3/26/2015

Pre-requisites: None

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3425

Aims, Objectives and Learning Outcomes

This course will focus on the nexus between three different but linked types of security: energy, water, and food. "Nexus thinking," whereby the interrelationships between energy, food and water become the primary unit of analysis, is spurring innovations in theoretical understandings and policy design. Increasingly, nexus thinking is being applied to diverse issues, including resource management, poverty eradication and human development, and the green economy.

Seeking to bridge thinking in environmental sciences, international relations, and anthropology this course examines this nexus at various levels of analysis (global, regional and local), including cross-scale linkages. The feedback loops between energy, food and water policy and security issues will be examined, showing how trade-offs are often made and look for synergies and new solutions when policy communities interact.

The course begins with a theoretical review of the debates surrounding environmental and energy security. The central part of the course is case-based, with a focus on both macro and micro-level issues. The course concludes with a focus on international environmental governance.

Learning Outcome	Assessment	Activities	Estimated Workload
Understand the current state of global energy, food, water systems, their vulnerabilities and strengths; Be able to apply various theoretical lenses to the analysis of WEF security and sustainability; Be familiar with and able to apply nexus thinking to the analysis of WEF at various scales; Have acquired skills to work in both individual and group projects.	Participation and reading presentations (20%) Group work – case study and presentation (40%) Final paper (40%)	Lectures / discussion Reading Group work - case studies Final paper	36 30 14 20
Total hours 100			100

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Comparative and Sustainable Food Systems

Lecturers/Instructors: Philip A. Loring

Credits: 2

Duration: 2/16/2015 To 2/20/2015 And 3/2/2015 To 3/6/2015

Pre-requisites: none

Course e-learning site: insert link here. The full syllabus should be posted there too

Aims, Objectives and Learning Outcomes

This class provides students with a historiographical and political-ecological perspective on contemporary food systems challenges around the world. The class is taught in two phases: the first attends to food systems historically and in comparison. Hunting and gathering, slash and burn agriculture, pastoralism and transhumance, and other small-scale/peasant systems are explored, followed by a critical exploration of the so-called agricultural revolution. In phase two, the contemporary industrial/chemical global food system complex is interrogated alongside issues such as food insecurity, hunger, population growth, and the Green Revolution. The class concludes with a discussion of how to move forward in addressing the food systems challenges of the 21st Century.

Learning Outcome	Workload	Assessment	Activities
Working familiarity with key concepts including food systems, food security, carrying capacity, tragedy of the commons, agroecology, etc.	25%	Preparation & Participation 20 points Glossary 35 points Reflection essay 45 points	• Mini-lectures • Short documentary viewing • Hands-on group learning activities • Group discussions • Field trip (local market) • Reading • Preparation for assessed work
Knowledge of historical Old and New World food systems	20%		
Knowledge of the parameters of the totalitarian agriculture "revolution" and the industrial/global food system	20%		
Ability to identify and discuss the root causes of food insecurity, hunger, and population growth	15%		
Familiarity with debates regarding intellectual property, genetically modified organism, and small versus large scale solutions.	20%		
Total hours	55 hours		

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Environmental Politics: Environmental Activism and Communication

Lecturers/Instructors: Tamara Steger

Credits: 4

Duration: Winter Semester

Pre-requisites: None

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3410

Aims, Objectives and Learning Outcomes

Environmental Activism and Communication is designed to provide and bridge theoretical understanding and practical experience in effective environmental communication. Theories on the purpose and effectiveness of environmental communication are explored with an emphasis on the concept of framing. Students gain direct experience with both analyzing environmental communication media, and developing and implementing an environmental communication strategy. The course will engage multiple learning forums including critical seminar discussions, class exercises, and concrete practical group work.

Learning Outcomes	Assessment	Activities	Time
Demonstrate skills in critical analysis, reflection and reasoning, and the ability to design an effective communication strategy based on theory and research.	Communication Strategy (min. 5 pages). (30%)	Review purpose(s) and principles of effective environmental communication; discuss guidelines on design and content of communication strategy; prepare communication strategy.	varies
Design, administer, and incorporate useful feedback session involving target audience to improve communication; Apply collaborative group work skills; Implement communication strategy	Test Run ; Final communication product. Specific assessment guidelines provided on moodle site. (Test Run: 15%; Final Product: 35%)	Review theories and research, and engage in class exercises on environmental communication; Do "studio group work"; Implement environmental communication strategy including "Test Run"	varies
Articulate (and apply) principles of effective environmental communication theory, concept of framing, environmental communication strategy structure and content; Analyze, critically evaluate, and draft environmental communication messages and visuals.	Attendance, preparedness for class (i.e., completion of reading assignments), Socratic method and "Frame Game" performance, work delivery (quality and timeliness) based on proposed comm. strategy, class contribution, individual group member evaluations (20%)	Participate in class; prepare for class; participate and demonstrate knowledge in Socratic Method exercise and "Frame Game"; and contribute to the development and implementation of project work based on the communication strategy.	varies
Total Hours: 100			100 hours

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Environmental Governance: Advanced Topics

Lecturers/Instructors: Alex Antypas

Credits: 4

Duration: Winter Semester

Pre-requisites: None

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3408

Aims, objectives and learning outcomes

This course contains two main elements: a theoretical part that provides conceptual tools with which to analyze global environmental policy issues and institutions; and an examination of the evolution of the global environmental agenda in the two decades, with a special emphasis on the development of environmental governance mechanisms and agendas established in connection with the Rio Conference in 1992 and in the context of North-South debates. One of the main aims of the course is to provide students with the means of assessing the progress made, or not made, since Rio and in preparation for the follow up UNCSD (Rio +20) in 2012. The course will also include sections that examine the role of non-state actors in global environmental governance, including scientists, civil society organizations, and corporations.

Specific learning outcomes will include:

1. Knowledge of key issues in environmental governance, especially as related to post-Earth Summit policy issues;
2. Knowledge of the relationship between environment and the global political economy;
3. A critical understanding of the interests and conceptual understandings of state and other actors in global environmental politics;
4. The ability to think strategically about opportunities and obstacles in the development of environmental regimes and governance systems.

Educational activities, assessment and estimated workload

Learning outcomes	Assessment	Educational activities	Estimated workload (h)
Key issues in environmental governance; environmental regimes; actor analysis; strategic thinking	Research paper assignment (50%) Exam (50%)	Lectures and seminars	32
		Research paper and take home exam	40
		Reading	48
Total			**120 hours**

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Environmental Philosophy

Lecturers/Instructors: Alan Watt

Credits: 2

Duration 1/16/2015 To 3/31/2015

Pre-requisites: None

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3409

Aims, Objectives and Learning Outcomes

To explore some of the major themes in contemporary environmental philosophy. The objective is not just to present ideas and arguments as objects of knowledge (though students will be expected to develop an understanding of major debates in the literature), but to help students come to their own informed and reasoned views on the key issues.

At the end of this unit a successful student should be able to:

1. Accurately deploy key concepts in philosophy and ethics and demonstrate awareness of major developments in environmental philosophy.
2. Demonstrate deep understanding of major theories in environmental ethics
3. Distinguish rival views in environmental ethics and critically evaluate their strengths and weaknesses.
4. Identify and critically assess the philosophical aspects of major environmental issues.

Learning Outcome	Assessment	Activities	Estimated Workload
1	Class Participation	Lecture	2
1-4	Class Participation	Seminars	14
1-4	Participation, Assignment	Reading	18
1-4	Assignment	Assignment preparation	14
1-3, possibly 4 (depending on seminar topic)	Class Participation	Seminar presentation preparation	5
1-4	Assignment	Tutorial (optional)	2
Total hours 53-55			53-5

Final grade for the course is based on Assignment (80%) and Class Participation (20%)

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Policies for Sustainable Transport

Lecturers/Instructors: Zoltan Illes

Credits: 2

Duration: 2/17/2015 To 3/13/2015

Pre-requisites: none

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3419

Aims, Objectives and Learning Outcomes

The aim of this unit to provide students with a deep understanding of environmental, economic, and social problems related to modern transport systems. We will also discuss the key transport policy choices, their environmental and social implications and specifically focus on the recent trends and challenges of developing transport in countries in transition.

At the end of this unit a successful student should be able to:

1. *have a deep understanding of key concepts in transport studies such as access, mobility transport development patterns and major determinants of transport development,*
2. *fully understand social, environmental and other externalities of transport; strategies for reducing transport-related environmental effects; instruments for environmental policy in the transport sector,*
3. *design and present own strategies for environmentally sustainable transport systems.*

Learning Outcome	Assessment	Activities	Estimated Workload
Understanding key concepts in transport studies as access, mobility, transport development patterns and major determinants of transport development.	Exam class participation	Lecture Reading	8 8
Understand social, environmental and other externalities of transport; strategies for reducing transport-related environmental effects; instruments for environmental policy in the transport sector	Exam	Seminar Reading	14 6
Design strategies for environmentally sustainable transport systems	Assignment	Assignment preparatory seminar and group discussion	12
	Exam preparation	Exam	8
Total hours			**56**

Sustainable Development and Global Transitions

Lecturers/Instructors: Laszlo Pinter, Simon Olsen (TA)

Credits: 3

Duration: 2/10/2015 To 3/28/2015

Pre-requisites: none

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3423

Aims, Objectives and Learning Outcomes

The course will provide an overview of the concept of sustainable development, including a review of its underlying rationale, theory, evolution, use in various current policy contexts and its critique. New perspectives from sustainability science and global systems science (GSS) will be introduced and critically reviewed. We will consider sustainable development as a problem of transition in complex socio-ecological systems mainly through the lens of governance and policy. We will get acquainted in detail with governance and policy tools and mechanisms, such as sustainability indicators, assessments, scenarios and strategies. We will explore how these could be used to inform the articulation of sustainability goals and visions and the construction of adaptive transition pathways. Throughout the course conceptual points will be illustrated with practical examples at various – ecosystem, community, national or international – scales and in different sectors. The course will combine lectures with various interactive elements, including small group work, micro-exercises, a simulation game, a field trip and others.

Learning Outcome	Assessment	Activities	Estimated Workload
1. Be familiar with the underlying rationale for sustainable development as a science and policy domain and a field of practice; 2. Understand the context of global SD goals and transitions; 3. Know some of the key analytic and policy tools related to SD; 4. Have learnt to apply the SD framework for the analysis of socio-ecological system in a place-based context; 5. Familiarity with global sustainability issues and key political processes.	Class participation, contribution to online discussions (40%) Assignment, part 1 (20%) Assignment, part 2 (20%) Presentation of assignment (20%)	Lecture and seminars Reading Written assignment Field trip	13.3 24 15 16
Total hours Click here to enter text.			68

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Environmental Practicum

Lecturers/Instructors: Viktor Lagutov

Credits: 2

Duration: 1 weeks. January To March

Pre-requisites: none

Course e-learning site: http://ceulearning.ceu.hu

Aims, Objectives and Learning Outcomes

The unit allows students to get first-hand experience in dealing with environmental challenges in international, industry, nongovernmental organizations, and other relevant institutions. Students will tackle contemporary environmental issues assisting professionals and experiencing real-life context and practical application of their theoretical coursework. Through this experience students enhance their research, critical thinking, problem-solving and presentation skills. The unit can be used to get acquainted with potential host institution to conduct thesis research as well as to get familiar with potential research topic. Students are supervised jointly by representative of host organization and appointed departmental faculty member. To pass the course it is required to intern a minimum number of hours, report experience and discuss it with other course participants. The ideas for internship placement are also welcome from other CEU departments or student professional contacts.

Learning Outcome	Assessment	Activities	Estimated Workload
Fostering communication skills in professional arena and workflow planning	Internship proposal	Formulation and negotiation of internship topic	5
Practical hands-on environmental experience Getting acquainted with professional communities	Interim progress reports	Intern hours according to the approved internship plan	40
Presentation, writing and communication skills in a specific professional area (vocabulary, etc)	presentation	Interim group discussions and final public presentation of internship achievements	5
Total hours			50

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Environment and Security

Lecturers/Instructors: Stephen Stec

Credits: 2

Duration: 1/1/2015 To 4/1/2015

Pre-requisites: none

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3406

Aims, Objectives and Learning Outcomes

NOTE: This is a cross-listed course, with IRES and DPP. Environmental change at all levels - global, regional, national, local - is putting increasing pressure on human development and on the capacities of the natural environment to sustain life. Political recognition of the security aspects of environmental protection and management has grown in response to increased public perception that the current development paradigm brings us perilously close to the ultimate limits to growth. Perceived security threats related to the environment range from localized competition over limited water access to existential angst over doomsday scenarios. At the same time, environmental issues are seen as a natural arena for cooperation and reduction of tensions. As a consequence, the „securitization" of the environment both introduces environmental issues to a new community (the security community) as a tool and raises the stakes with respect to policy responses to environmental problems. This course builds upon other courses that investigate assumptions about economic and human development, environmental politics, environmental justice, international cooperation, environmental threats and opportunities, to explore the growing political, social and legal appreciation of the environment-security nexus. It deals with such topics as the environment in warfare, conflict resources, post-conflict environmental cooperation and governance, confidence-building through the environment, and terrorism and the environment.

Learning Outcome	Assessment	Activities	Estimated Workload
1. Be familiar with the concepts, definitions, communities and constituencies, have an in-depth understanding of relationships, concerning environment/security nexus through national, global and international examples 2. Gain an in-depth appreciation of environment and security with respect to a particular topic of the student's interest 3. Be able to critically evaluate trends and concepts and apply knowledge gained in the course to concrete policy issues	Class attendance and participation Written assignment	Seminars Reading Written assignment	18 18 20
Total hours Click here to enter text.			56

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Environmental Management

Stream coordinator: A.Cherp

Products & Environment: Analytical Impact Assessment Methods

"Products and Environment: Analytical…" (3 credits) is mandatory for all MESPOM students

Lecturers/Instructors: Dr. Andrius Plepys, IIIEE/Lund, Sweden

Credits: 3

Duration: From 1/29/2015 To 4/30/2015

Pre-requisites: none

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3420

Aims, Objectives and Learning Outcomes

The main objective of the course is to equip the students with the ability to critically interpret and work with the results of different environmental assessment methods for products and services based on life cycle thinking. The students will learn about the principles of some mainstream assessment methods, such as lifecycle assessment (LCA), input-output LCA, material intensity accounting and ecological footprint, what answers can they provide and what are their strong and weak sides.

The course is a combination of lectures, seminars and individual and group assignments. It attempts to be practice-oriented and will use many real life examples that link to other past and future courses, such as energy systems, waste management, product design, industrial processes and environmental management, environmental policy-making and economics.

Class attendance highly advised and active participation in discussion is desirable.

Learning Outcome	Assessment	Activities	Estimated Workload
Familiarize with the rationale of lifecycle-oriented assessments for products and services. Understand the limitations of LCA and other assessment approaches.	Individual assignment (eco-indicator calculation) 10%	Lectures, reading, calculations	2 + 4+ 3
Understand how the results from environmental assessments are to be interpreted and where and how they could be applied in practice	Group assignment (LCA reviews) 50%	Lectures, reading, seminar discussions, group work	2 + 20 + 8 + 30
Be able to apply or adjust assessment methodologies for practical problems	Active in-class participation in discussions, exam 40%	Practical seminars, home practice & exam preparations	4 + 15
Total hours incl. in-class and off class activities			88

Sustainable Energy Systems and Transitions

Lecturers/Instructors: Aleh Cherp, Diana Urge-Vorsatz, Michael LaBelle

Credits: 2

Duration: 2/6/2015 To 3/6/2015

Pre-requisites: Introduction to Environmental Management (Fall Semester)

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3599

Aims, Objectives and Learning Outcomes

This course aims to (1) develop knowledge on energy systems, their environmental impacts and sustainable energy transition pathways and (2) develop skills for energy systems and energy policy analysis. The course largely builds on the Global Energy Assessment (www.globalenergyassessment.org) where two of the instructors served as convening lead analysts.

Learning Outcome	Assessment	Activities	Estimated Workload
1. Understand the key concepts and principles of energy systems 2. Understand environmental and sustainability impacts of energy systems 3. Understand pathways for sustainable energy transitions 4. Able to conduct national energy system analysis 5. Able to evaluate and propose policies supporting sustainable energy transitions	Participation and presentations 10% Individual assignment 50% Exam 40%	Lectures Readings and exam revision Seminars and presentations Preparing written assignment	10 12 6 28
Total hours 86			56

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site

Energy Policy, Environment and Management (BUSI 536E)

Lecturers/Instructors: Michael LaBelle

Credits 2 - Cross-listed with CEU Business School

Duration: 2/4/2014 To 3/25/2015

Pre-requisites: None

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3481

Aims, Objectives and Learning Outcomes

Navigating the business and policy world of the energy sector requires awareness of government policies, environmental issues and how a business operates. This course is designed to equip students with an in-depth knowledge of the policy process and the investment perspective of business. Students will work at the intersection of EU policy, national regulations and business decision making in the energy sector. The course aims to involve students from both the CEU Business School and Department of Environmental Sciences and Policy. *Student led teams will work on projects connected to a company, organization or institution.* Output of the course provides an important answer or perspective affecting the selected area. For the 2014-15 academic year, Siemens will be a key partner with a business and policy assessment of energy efficiency technology in buildings.

Learning Outcome	Assessment	Activities	Estimated Workload
• Learn how to assess policy making process at both the national and EU level • Evaluate the national business environment in relation to the energy sector • The impact of policy on the environment and business • Cross-disciplinary approach to education and how multiple perspectives join in the policy and business realm • Provide students with experience working with a company, organization at the crossroad of policy and business.	Research Journal Terms of Reference and Communication Plan Individual project analysis Final group project	Lectures and project work Research Journal Terms of Reference and Communication Plan Individual project analysis Final group project	24 2 4 25 2
Total hours 57			57

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Environmental Assessment and Planning

Lecturers/Instructors: Aleh Cherp and Maia Gachechiladze

Credits: 3

Duration: 2/2/2015 To 3/18/2015

Pre-requisites: Introduction to Environmental Management (Fall Semester)

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3575

Aims, Objectives and Learning Outcomes

The aim of this unit is to develop students' knowledge and skills related to dealing with the prediction and "management" of the future in human-environment interactions. The course has a special emphasis on environmental impact assessment and strategic environmental assessment but also covers elements of environmental planning and scenario construction.

Learning Outcome	Assessment	Activities	Estimated Workload
6. Know several fundamental techniques of EIA and SEA 7. Understand the essentials of environmental planning and developing sustainable development strategies 8. Be able to review quality of EIA, SEA, and sustainable development planning documents 9. Be able to prepare professional reports and presentations in the field of EA and planning	Participation and presentations 20% Individual assignment 80%	Lectures Readings Seminars and presentations Preparing written assignment	12 12 12 50
Total hours 86			total hours

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site

Carbon Reporting: Theory and Practice

Instructors: Ruben Mnatskanian, Ekaterina Tsvetkova

Credits: 2

E-mail: mnatsaka@ceu.hu – Ruben Mnatsakanian

ekaterina.tsvetkova@mespom.eu – Ekaterina Tsvetkova

Course Description

By definition, an externality is an activity of one entity that affects the welfare of another entity in a way that is outside the market mechanism.[2] Greenhouse gas (GHG) emissions are the prime example most economists now think of when discussing externalities. The course will provide a geographical overview of emissions trading schemes and tendencies within Americas, Europe, Asia-Pacific and Africa; together with that all processes and mechanism discussed will be also divided into two major categories – regulatory or mandatory (compliance) trading and reporting and, on the other hand, voluntary activities and schemes.

Students will be given an opportunity to create a carbon disclosure report and identify corporate risks and opportunities connected to climate change issues as well as calculate emissions of an organization and submit a Faux CDP Report.

The purpose of this course is not only to deliver theoretical knowledge but also to facilitate the development of analytical and practical skills among students. Therefore course lectures will be supported with varied seminar activities including class discussions, debates, quizzes and other exercises, comprehensive illustrations from modern business case studies etc.

Intended Learning Outcomes

CORE LEARNING AREA	***LEARNING OUTCOME***
	By the end of this course successful students should:
Acquired knowledge	grasp the basic principles of GHG accounting and reporting, get familiar with the scopes of emissions and main uncertainties and calculation techniques applicable to each of the scopes, international and country specific compliance and voluntary emissions trading and reporting schemes, be able to calculate basic carbon footprint of an organisation
Reading skills	be able to read and understand texts on CO2 accounting, reporting and GHG emissions sources
Communication skills	be able to express and supplement their own analysis and conclusions on the course topics obtained during the peer-to-peer interactions
Cultural sensitivity and diversity	have increased understanding and acceptance of different viewpoints in carbon finance debates
Critical thinking	demonstrate ability to apply critical and reflective thinking to the major points of the course discussions
Ethics and responsibility	be motivated to consider ethical notions of business activities, and have a thorough view on public and private responsibilities in relation to GHG emissions
Decision-making knowledge and skills	be able to understand the decision-making process in business in respect to carbon accounting and reporting, the role of GHG accounting & reporting tools, and learn to make basic decisions

[2] Rosen and Gayer, Harvey S. and Ted (2008). Public Finance. New York, NY: McGraw-Hill Irwin. pp. 71–103.ISBN 978-0-07-351128-3.

Environmental Research and Communication

Stream coordinator: A.Watt

Academic Writing for the MSc Thesis

Lecturers/Instructors Alan Watt

Credits: 1

Duration: 1/15/2014 To 4/20/2015

Pre-requisites: None

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3577

Aims, Objectives and Learning Outcomes

The aim of this unit is to provide students with the key skills required to research and write a thesis in the field of environmental sciences, policy and management. The unit is run on a pass/fail basis.

At the end of this unit a successful student should:

Knowledge and understanding	*Be familiar with the key structural components of theses and research papers in the field*
Intellectual skills	*Be able to critically evaluate the quality of structural features of theses*
Practical skills	*3. Be able to write good thesis proposals, introductions, conclusions, literature reviews, abstracts*
Transferable skills and personal qualities	*4. Have an increased capacity to write proposals and research reports.*

Learning Outcome	Assessment	Activities	Estimated Workload
Learning outcomes 1-4	Class attendance, completing written assignments	Seminars Reading and preparation Written assignments	12 4 11
Total hours Click here to enter text.			27

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Social Research on Environmental Problems

Lecturers/Instructors: Tamara Steger

Credits: 1 credit

Duration: January 2015 To April-May 2015

Pre-requisites: None

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3421#section-0

Aims, Objectives and Learning Outcomes

This course is designed to provide masters' students with a critical basis for understanding and conducting social science research on environmental issues. The purpose of this course is to help students build a critical epistemological base and a practical understanding of social science research, and to prepare graduate students to conduct social research for their masters' theses. Through seminars, readings, exercises, and assignments on the principles of social research, and on social research strategy, design and methods, students gain a richer understanding of social science and how to conduct social research.

Learning Outcome	Assessment	Activities	Estimated Workload
• understand the nature of social research; • understand and be able to apply critical thinking skills; • be able to define different epistemological perspectives; • be able to develop a preliminary research design and appropriate methods for conducting thesis research.	Class participation and attendance (20%); Completion of required readings (30%), class exercise and assignment (50%)	Seminar discussions; Assignments: reading, critical thinking exercise, and poster presentations	Varies, but no more than 25-30 hours
Total hours: 25-30 hours			25-30 hours

Interpretive Approach to In-Depth Interviewing

NOTE: This course is mandatory for MS students and optional for MESPOM.

Lecturers/Instructors: Tamara Steger

Credits: 1 credit

Duration: January 2015 To April-May 2015

Pre-requisites: None

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3416

Aims, Objectives and Learning Outcomes

In-depth interviewing is a specific interpretive research technique for collecting data on how people define, perceive and understand a particular concept(s), situation, event, problem, etc. This course is specifically geared toward learning specific interviewing techniques that generate understanding about how people define and understand environmental problems and, therefore, how they approach or seek to address an environmental problem. At the end of this course, you should understand the purpose of in-depth interviewing, be able to prepare and conduct an in-depth interview, and produce and analyze interview-generated data. The course will cover the following:

- In-depth interviewing: Why conduct an in-depth interview? What can you expect (and not expect) from an in-depth interview?
- In-depth interview preparation: designing an interview protocol
- Conducting an in-depth interview to maximize rich data collection
- Analyzing in-depth interview data

In order to pass this course you must: Read all assigned reading and engage in class discussions; Complete, hand in and pass all assignments as per the instructions; and Attend classes.

Learning Outcome	Assessment	Activities	Estimated Workload
• Understand how (and why) to conduct in-depth interviewing and how to analyze interview data. • Strengthened inductive reasoning skills.	Attendance (20%); Engagement of readings in class discussion (20%); In-depth interview (30%); interview data analysis (30%)	Seminar discussions based on readings; interviewing and transcribing raw data; research team analysis of interview data	Varies, but no more than 25-30 hours
Total hours: 25-30 hours			25-30 hours

Thesis Research Seminar and Workshop

Lecturers/Instructors: Tamara Steger

Credits: 1

Duration: Winter Semester

Pre-requisites: Only available to 1-year MSc and 2nd year MESPOM

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3410

Aims, Objectives and Learning Outcomes

Conducting and completing a thesis is a challenging, dynamic and adaptive process that, in addition to student/supervisor interactions, can also benefit greatly from the mutual intellectual engagement of peers in a mentor-facilitated, well structured, yet personalized context. The purpose of this course is to provide a productive intellectual community forum to strengthen and tailor knowledge, understanding, skills and confidence (through demystification) for completing a masters thesis. While attentive and adaptable to the varied needs of thesis researchers, the course explores and clarifies some of the foundational aspects of thesis work including developing a research question and a table of contents to reflect a cohesive and comprehensive thesis. The course will specifically engage the individual research aspirations of each student to facilitate thesis development and completion. One-year students and returning MESPOM students are likely to find the course especially useful!

Learning Outcome	Assessment	Activities	Work-load (est.)
Demonstrate understanding of how to: bring focus to thesis research (including relevant conceptual framework), develop an appropriate research question, and critically reflect on research coherency (alignment of research question with conceptual framework, methods, and data analysis)	*Draft of research question (35%)*	*Readings, class discussions, and class exercises.*	*varies*
Evaluate the degree of comprehensiveness and coherence of theses in terms of overall structure; and prepare a preliminary or "living" thesis outline.	*Thesis table of contents with justification (living document)* *(55%)*	*Discussion of thesis structure and components; Critical review of completed and anticipated theses in light of departmental assessment guidelines*	*varies*
Employ understandings about thesis research design and structure and apply them to others' and one's own research work in class discussions and in assignments.	*Class attendance; participation in class discussion, participation and contributions in feedback sessions, and exercises; timely submission of quality assignments (10%)*	*Class seminar discussions; feedback forums; readings, exercises, and assignments*	*varies*
Total Hours: 25-30			*25-30 hours*

Descriptions of individual courses
Semester 2b (Spring): Environmental Management B

Assessment, Modelling and Scenarios for Ecosystems Management

Coordinator: Prof. C.P. Halvadakis, and P. Gaganis

Credits: 6

Duration: 5/25/2015 To 7/3/2015

Lecturers/instructors: C.P. Halvadakis, P. Gaganis, D. Haralampopoulos, T. Akriotis, A. Kizos, I. Botetzagias

Mandatory for all MESPOM students

Aims & objectives

This course aims at developing an in-depth understanding of the theory and application of ecosystem management, through field experience and lectures. Lesvos is an island with a long history of human habitation and impacts of human activities, a wealth of natural and semi-natural ecosystems and biodiversity, conflicting interests of land use and pressures on the environment which are representative of most regions in the south of Europe. The island of Lesvos provides an ideal terrain to study ecosystem management in practice.

Learning outcomes

At the end of the course a successful student should be able to:

1. Understand and use basic concepts of environmental management
2. Understand the complexity and meaning of the Man/Nature interaction and how it evolved through time
3. Understand components of ecosystem structure and function on different scales
4. Handle and utilise available environmental data sets to identify critical elements, to reach conclusions and to make decisions for ecosystem management

Educational activities, assessment and estimated workload (units of hours)

Learning outcomes	Assessment	Educational activities	Estimated workload
Understand and use basic concepts of environmental management	Computer based Exam Participation in class	Lectures	9
		Reading assignment	7
		Class discussion	2
		Field Trip	10
			28
Understand the complexity and meaning of the Man/Nature interaction and how it evolved through time	Participation in class Individual Assignment	Lectures	9
		Reading assignment	7
		Class discussion	2
		Field Trip	20
			38
Understand components of ecosystem structure and function on different scales	Participation in class	Lectures	9
		Reading assignment	7

Learning outcomes	Assessment	Educational activities	Estimated workload
	Individual Assignment Computer based Exam	Class discussion	2
		Field Trip	20
			38
Handle and utilise available data sets to identify critical elements, to reach conclusions and to make decisions for ecosystem management	Participation in class Evaluation of Group Presentation Small group Assignment	Lectures	8
		Reading assignment	6
		Class discussion	2
		Field Trip	10
		Group Assignment	15
		Public Presentation	5
			46
Total hours			150

Key topics

Structure and function of ecosystems on the island of Lesvos/Mediterranean: geology and hydrology, climate, vegetation, biodiversity, biogeography, natural resources and humans. Effect of human activities on ecosystems of Lesvos and their impacts past and present: agriculture and grazing, water resources, water pollution, forest fires, urban development, energy resources, ecotourism. Environmental monitoring tools in practice. Legislative framework, especially with reference to EU directives.

Readings

General References

Wright, R.T. (2008) "*Environmental Science: Toward a sustainable future"*, 10/e, Pearson Prentice Hall, New Jersey, USA.

Masters G.M., (1996), "*Introduction to environmental engineering and science",* 2nd ed., Prentice Hall, New Jersey, USA.

Reading material will be supplied on a topic basis together with the weekly time schedule

Environmental Management in Industry (EMI)

Lecturers/Instructors: Philip Peck, Torbjörn Brorson, Naoko Tojo & Thomas Lindhqvist (IIIEE, LU)

Credits: 4 ECTS

Duration: 4/22/2015 To 5/12/2015

Pre-requisites: *Mandatory for MESPOM students selecting the Lund track*

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3845

Aims, Objectives and Learning Outcomes

This course provides participants with understanding of **why** social, organisational and regulatory environments shape directions for the sustainability efforts of firms; **what** environmental management is and how it links to sustainability issues; and **how** policy-makers can influence the manner in which firms behave, or how they deliver products or services. The course consists of three modules – 1) institutional context for EMI; 2) Practices and norms for EMI, and 3) Policy interactions via products for EMI – finalized with a debate exercise covering the three areas. At the end of the course students should be able to achieve the following learning outcomes.

Learning Outcomes	Assessment	Activities	Estimated Workload
1. Understand the scope of sustainability issues as they relate to the firm, reasons underlying the environmental regulation of firms, and how an organisation's management may respond to such external stimuli 2. Analyse strategies that seek to manage dynamic sustainability related issues 3. Rationalise business decisions based on environmental and socio-economic context	Written documentation and performance in case sessions (28%)	Lectures	6
		Case preparation & review of literature	20
		Case sessions	4
4. Describe the fundamental aspects of industrial environmental management, including environmental management systems, indicators, auditing, reporting and communication. 5. Analyse and discuss the role of the of the environmental/sustainability	Module B Assignment (26%)	Lectures	12
		Assignment	10
		Reading	6
6. Understand the basic rationale behind policy instruments influencing the environmental impacts of products and the issues related to leading product-related environmental policies 7. Analyse and understand the implications of various policy interventions concerning products	Module C Seminars (20%)	Lecturer	8
		Seminars incl. preparation	12
8. Objectively view and analyse different sides of sustainability related issues in a structured manner 9. Prepare, select and present arguments for a debate, to quickly consider new arguments and to create counter-arguments	Debate assignment (26%)	Preparation	24
		Debate session	4
Total hours Click here to enter text.	100%		106

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Environmental Economic Instruments

******this course is mandatory for MESPOM students on the Lund track******

Lecturer: Katharine N. Farrell

Contact: katharine.farrell@uab.cat / www.katharine-farrell.org / katy_nora (skype)

Link: http://ceulearning.ceu.hu/course/view.php?id=3844

Credits: 2

Duration: TBA

Schedule:

- Initial Lectures; Preparation for Project Work
- Reviews of Individual Assignment (by appointment)
- Readings on Applications;

Development of Group Project Work Proposals

- Second Round of Lectures
- Group Presentations
- Deadline for Final Revised Group Project Work
- Deadline for Individual Assignment

Aims and Objectives:

The purpose of this course is to provide students with a basic understanding of the various types of economics oriented environmental policy instruments discussed in the academic environmental economics literature and employed by policy makers on the ground in democratic societies. Review of three basic types of economics oriented environmental policy instruments - Performance Related Standards; Taxation & Subsidy; and Market Based Instruments – will form the basis for the course, which is intended to complement and to draw upon learning in policy analysis undertaken in other modules of the course.

Course Structure Overview:

- Instrument Options (10 hours)
- Readings & Lectures
- Distinct Features of Economics Oriented Environmental Policy (24 hours)
- Readings on Applications; Development of Project Work Proposals; Online Discussion and Review of Group Projects and Individual Assignment Ideas
- Preparation and Discussion of Case Based Examples and Assessments: (20 hours)

  Lectures; In Class Project Work; Independent Project Work

Assignments:

Participation: 20% of total mark

- attendance: 60% of sub-category mark, 12% of total mark

- engagement in class discussions: 30% of sub-category mark, 6% of total mark

- e-participation (email/skype/moodle): 10% of sub-category mark, 2% of total mark

- penalty for excessive pc use during lectures: -20% of sub-category mark, - 4% of total mark

Group Project Work: 20% of total mark

- good presentation: 15% of sub-category mark, 3% of total mark

- engagement in group work: 10% of sub-category mark, 2% of total mark
- addressing the question: 40% of sub-category mark, 8% of total mark
- familiarity with lecture material: 25% of sub-category mark, 5% of total mark
- additional knowledge and insights: 10% of sub-category mark, 2% of total mark

Individual Assignment: 60% of total mark

- administration: 10% of sub-category mark, 6% of total mark
- good presentation: 15% of sub-category mark, 9% of total mark
- addressing the question: 35% of sub-category mark, 21% of total mark
- familiarity with lecture material: 30% of sub-category mark, 18% of total mark
- additional knowledge and insights: 10% of sub-category mark, 6% of total mark

Assignment Specifications:

Group Project Work: 20% of total mark

Final Individual Assignment: 60% of total mark

Industrial Waste Management and Pollution Control

Lecturers/Instructors: Zoltan Illes , invited speakers

Credits: 3

Duration: 7th May To 21th May

Pre-requisites: none

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3849

Aims, Objectives and Learning Outcomes

This unit covers the general activities and processes used in industry, the ways in which wastes are produced, pollution control and waste minimization. It also deals with hazardous waste disposal and problems of occupational health. It aims to look at the types of processes that take place in industry and review the types of emission that can occur. It also aims to define the role of engineering in preventing and handling industrial emergencies.

Learning Outcome	Assessment	Activities	Estimated Workload
- Understanding of processes taking place in industry and their consequences on waste generation - Knowledge about pollution prevention methods - Understanding the concepts of "circular economy", „cradle-to-grave" - Knowledge - Be able to apply knowledge gained in the course - Be able to evaluate policy options in waste management, - Be able to discuss the advantages and disadvantages of various techniques - Decision making methods - Use of control technologies (end-of-pipe versus integrated)about waste management techniques	Presentation (100%)	Lecture Discussion Group work Filed trip	10 6 3 1,5 24
Total hours Click here to enter text.			44,5

Adaptive management and resilience of socio-ecological system

Lecturers/Instructors: Laszlo Pinter with Anton Shkaruba and Andrea Deri

Credits: 3

Duration: 4/20/2015 to 4/29/2015

Pre-requisites: None

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3850

Aims, Objectives and Learning Outcomes

The course will introduce students to vulnerability and adaptation studies, including concepts, tools and methods of vulnerability, adaptation and resilience analysis, and management approaches developed with advances in adaptation science in mind. The focus will be on coupled socio-ecological systems (SES) that are characterized by high levels of complexity and uncertainty, including those associated with human activities and responses. Although the course will draw on examples from climate change adaptation case studies and practices, its scope is broader, and other significant aspects of global environmental change will also be covered.

Learning Outcome	Assessment	Activities	Estimated Workload
Understanding relevant theories, concepts, methodology and tools Understanding various policy and management contexts and common problems of vulnerability and adaptation Identifying and understanding V&A related stakeholder interests, ability to formulate, defend and critique positions on V&A grounded in particular perspectives and worldviews Ability to conceptualize and frame a V&A problem, find related literature and data, interpret data, use the concepts, tools an methods covered in the course, and draw policy/management relevant conclusions	Participation and reading presentations (20%) Group work – case study and presentation (40%) Final paper (40%)	Lectures and discussions Reading Research and writing of course paper Paper presentation	16.6 30 15 3.3
Total hours 64.9 hours			64.9

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Professional Environmental Careers

Lecturers/Instructors Aleh Cherp

Credits: 1

Duration: 4/22/2015 To 4/20/2024

Pre-requisites: none

Course e-learning site: http://ceulearning.ceu.hu/course/view.php?id=3843

Aims, Objectives and Learning Outcomes

The aim of this course is to develop knowledge and skills necessary for pursuing a successful career in the environmental sector. Students completing the course will be able to:

Learning Outcome	Assessment	Activities	Estimated Workload
• profile their aspirations and capacities for the next career step; • systematically identify and research career opportunities; • professionally present themselves through a resume, written and verbal communications and job interviews.	Pass/fail attendance and activity in the class and assignment submission	Lectures, interactive workshops, discussions with alumni	8 for class hours, 16 for independent work
Total hours Click here to enter text.			24

Sustainable Energy Solutions

Lecturers/Instructors: Michael LaBelle

Credits: 3

Duration: 4/20/2015 To 5/8/2015

Pre-requisites: None

Course e-learning site: http://courses.envsci.ceu.hu/course/view.php?id=312#section-0

Aims, Objectives and Learning Outcomes

Climate change is forcing society, institutions and companies to take up new energy technologies. This course explores how new energy technologies are leading a revolutionary fight against the established fossil fuel regime.

1. Critically analyze the current energy system and assess relationship between environment and energy technology
2. Understand the history of past energy eras and how and why energy sources were phased out
3. Gain a firm understanding of the types and requirements for renewable energy technologies
4. Understand how policy making occurs that affects the energy sector
5. Understand how state institutions, society and companies interact over a long period of time to create an energy system that supports economic growth
6. Assess how local resources help determine the types of energy technology and policies deployed

Learning Outcome	Assessment	Activities	Estimated Workload
Terms and definitions used in the energy sector Awareness of the evolution of energy systems Policy making in the energy sector Integration of how new energy technologies integrate into existing systems Difference between developed and developing countries' energy systems	Online reading summaries, 10% x 4 Class participation 21% (3 points x 7 lessons) Clean Tech Policy Paper 35% Final presentation: 4%	Classroom hours Optional tutorials Readings Case Study Summaries Online participation Clean tech policy paper	24 hours 12 hours 5 hours 4 hours 1 hours 25 hours
Total hours 72			72

Sustainable Tourism

Sustainable Tourism

Lecturers/Instructors: I. Spilanis, A. Troumbis, N. Zouros, K. Evangelinos, I. Botetzagias, M. Hatziantoniou

Credits: 2

Duration: 6/22/2015 to 7/3/2015

Pre-requisites: none

Course e-learning site: http://moodle.aegean.gr

Aims, Objectives and Learning Outcomes

The main objective of the course is to provide students with an understanding about the different components of tourism activity. The assessment of potentials (tourism attractions), tourism trends, strategies and obstacles regarding the application of policies and the role (responsibility) of different stakeholders in achieving development goals is going to be used as the necessary framework for policy development. The students will be assigned in groups to review the present situation of the island of Lesvos, to interview stakeholders and discuss potentials, limitations and development strategies in relation to the implementation of a Tourism Observatory.

Learning Outcome	Assessment	Activities	Estimated Workload
• Understand the overall concept of sustainable tourism. • Be familiar with the present trends in tourism development (demand, supply, organization of the market) • Learn about different methods for measuring and evaluating economic, ecological and social factors for sustainable tourism development. • Be familiar with basic principles and related indicators to measure performance and impacts or/and progress (tourism observatory). • Recognize the different policy instruments and tools available for entrepreneurs and policy makers • Be familiar with the different steps to be followed from the creation of a tourism product up to its commercialization	Students will be individually graded based on: 1. Individual assessment (written exam on lecture material) (40%) 2. Evaluation of Group written report and oral presentation – case study (60%)	Lectures Seminars Case study	16h 16h 28h
Total hours Click here to enter text.			60

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.

Ecosystem Management

Lecturers/Instructors: P. Gaganis, A. Troumbis, D. Haralampopoulos, T. Akriotis, A. Kizos, D. Schaelicke, I. Botetzagias, K. Evangelinos

Credits: 6

Duration: 5/25/2015 to 6/19/2015

Pre-requisites: none

Course e-learning site: http://moodle.aegean.gr

Aims, Objectives and Learning Outcomes

This course aims at developing an in-depth understanding of the theory and application of ecosystem management, through field experience and lectures. Lesvos is an island with a long history of human habitation and impacts of human activities, a wealth of natural and semi-natural ecosystems and biodiversity, conflicting interests of land use and pressures on the environment which are representative of most regions in the south of Europe. The island of Lesvos provides an ideal terrain to study ecosystem management in practice.

Learning Outcome	Assessment	Activities	Estimated Workload
1. Understand and use basic concepts of ecological thinking 2. Understand the complexity and meaning of the Man/Nature interaction and how it evolved through time 3. Handle and utilize available ecological data sets to identify critical elements, to reach conclusions and to make decisions for ecosystem management	Students will be individually graded based on: 1. Individual Assessment (computer- based examination) (30%) 2. Evaluation of group assignment and presentation (70%)	Lectures Reading assignment Class discussion Field Trip Group Assignment Public presentation	35 h 27 h 8 h 30 h 45 h 5 h
Total hours 150			150 h

Additional information including a full description of course assessments, schedule, and readings can be found in the full course syllabus located in at the course's e-learning site.