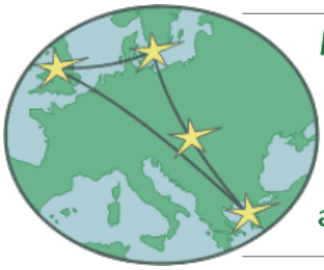

MESPOM
Masters in
Environmental
Sciences, Policy
and Management

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 2016-2017

Budapest – March 2017

Contents

Dear student:

This document describes the MESP and MESPOM programmes in the CEU's Department of Environmental Sciences and Policy in the 2016-2017 Academic Year.

Every effort has been made to keep the information accurate as of the time of preparation (December 2016). 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.

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.

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

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

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 advanced Environmental Management topics for MESPOM students.

CEU promotes interdisciplinarity and cross-unit collaboration. Therefore, as a Masters-level student you are allowed to earn up to 4 credits per academic year from courses offered by other academic units without any formal approvals required by the Department of Environmental Sciences and Policy. This is a University-wide regulation endorsed by the CEU Senate. To learn about courses offered at other departments, please visit: https://courses.ceu.edu

Table 1. Overview of the MESPOM and MESP study programmes in 2016/2017

Time	Module[a]	Courses (number of credits)
Semester 1 (Fall). Introduction to Environmental Sciences, Policy and Management		
Sept 12 – Dec 16	**Course Introduction (2)**	**Balaton retreat; ICTs for Environmental Professionals; Transferable Skills and Faculty Lectures. (2)**
Sept 19 – Dec 16	**Academic Writing (2)**	**Academic writing (2)**
	Introduction to Envir. Sciences (7)	**Introduction to Quantitative Research Methods (1); Non-Human Biosphere (2); Humans & the Biosphere (2); Water Resources Management (2)**
	Introduction to Envir. Policy, Law & Thought (6)	**International Environmental Policy (1.5); International Environmental Law (1.5); Environmental Thought (1); Student Policy Conference (2)**
	Introduction to Envir. Management (6)	**Introduction to Environmental Assessment and Management (3); Environmental Assessment of Products & Services (2); Solid Waste Management (1)**
Total for the 1st (Fall) Semester		**23 credits**

Semester 2a (Winter) Elective Topics in Environmental Sciences, Policy and Management		
Jan 9 – April 7	Environmental Science **Min 9 credits** **Total credits offered: 25**	Air Pollution & Climate Change (2)* Biodiversity & Conservation (3) Environmental Monitoring (3) Water Quality: Freshwater Environments, Human Impacts & the Provision of Drinking Water & Sanitation (3) Marine Ecosystems (1) Oil & Metal Pollution (2) Spatial Analysis with ArcGIS (4) * Environmental Modelling (3) * Natural Resource Use in the 21st Century: Prospects & Perspectives (2) Environmental Pollution & Biological Remediation (2)
Jan 9– April 7	Environment, Policy, and Society **Total credits offered: 31** Environmental Management A **Total credits offered: 12**	Transnational Environmental Politics: The Water, Food & Energy Nexus (3) * Global Food, Agriculture, & Development (4) * Organic Gardening & Local Food Systems (2) * Nature, Culture, Politics, & Justice (2) * Environmental Governance: Advanced Topics (4) * Environmental Philosophy (2) Environmental Politics: Environmental Activism & Communication (4) * Sustainable Development & Global Transitions (3) Environmental Practicum (3) Environment & Security (2) * Visual Cultures of the Anthropocene (2) * Introduction to Disaster Management (2) * Sustainable Energy Transitions (3) Energy Infrastructure: Management & Policy (3) * Environmental Assessment & Planning (2) Carbon Reporting: Theory & 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: 43]	
Jan 9 – April 7	Environmental Research & Communication; **Min 2 credits for MESP students**	Academic Writing for MSc Thesis§ (1) Approaches to Social Research§ (1) Interpretive Research Methods (1) Thesis Research Seminar & Workshop (1)
Mar - April	**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 14 – Jun 21	**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 & Scenarios for Ecosystems Management♦ (6); Sustainable Tourism♦ (2);** Adaptive Management & Resilience of Socio-Ecological Systems (3); Professional Environmental Careers (1); Introduction to Sustainable Forestry (2); Sustainable Energy Solutions (1); Organic Gardening Practicum (1); Constructing Energy Transition Scenarios with the Long Range Energy Alternatives Planning System (LEAP) software (2). **Total credits offered: 18**

Thesis Research Period (MS only)	
Apr 14 – 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).

§ mandatory for all 1-year MESP students

** mandatory for MESPOM students on the Lund track

♦ hosted by the University of the Aegean

Table 2. Courses, coordinators and instructors for 2016/2017

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	***B. Anthony***	***7***	***YES***
Non-Human Biosphere	B. Anthony	2	***YES*** (exemption may be granted from lectures only)
Humans & the Biosphere	R. Mnatsakanian,	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 Environmental Policy, Law & Thought	***A. Antypas***	***6***	***YES***
International Environmental Policy	A.Antypas	1.5	***YES***
International Environmental Law	S.Stec	1.5	***YES***
Environmental Thought	A.Watt	1	***YES***
Student Policy Conference	A. Antypas (& others)	2	***YES***
Introduction to Environmental Management	***A.Cherp, Z.Illes***	***6***	***YES***
Introduction to Environmental Assessment & Management	A.Cherp	3	***YES***
Environmental Assessment of Products & Services	A.Plepys	2	***YES***
Solid Waste Management	Z.Illes	1	***YES***
Semester 2a (Winter*) Note: Courses with asterisk (*) run in parallel, see below.*			
MODULE: Environmental Science	***R. Mnatsakanian***	***25***	***Min 9 credits***
Air Pollution & Climate Change *	R. Mnatsakanian, J. Karlik	2	NO
Biodiversity & Conservation	B. Anthony	3	NO; Reduced assignment load if taken with *Environmental Monitoring*
Environmental Monitoring	B. Anthony, T. Kovács	3	NO; Reduced assignment load if taken with *Biodiversity & Conservation*
Natural Resource Use in the 21st Century: Prospects & Perspectives	R. Mnatsakanian	2	NO
Water Quality: Freshwater environments, human impacts & the provision of drinking water & sanitation	Z. Illes D. Sigee	3	NO
Marine Ecosystems	D. Cogalniceanu	1	NO
Oil & Metal Pollution	K. White	2	NO
Spatial Analysis with ArcGIS *	V. Lagutov	4	NO
Environmental Modelling *	V. Lagutov	3	NO
Environmental Pollution & Biological Remediation Methods	T. Centofanti	2	NO

Course unit	Professor(s), coordinators	Course credits	Mandatory
MODULE: Environment, Policy & Society	***A. Antypas***	***31***	**For *Environment, Policy, and Society* and *Environmental Management A* modules, min 12 credits for MESPOM and 10 for MESP students.**
Transnational Environmental Politics: The Water, Food & Energy Nexus *	A. Antypas, L. Pinter	3	NO: Cross-listed with IRES
Visual Cultures of the Anthropocene *	Fowkes, M.,Fowkes, R.	2	NO. Cross-listed with Gender Dept.
Environmental Politics: Environmental Activism & Communication *	T. Steger	4	NO
Environmental Governance: Advanced Topics *	A. Antypas	4	NO
Environmental Philosophy	A. Watt	2	NO: Cross-listed with Dept. of Philosophy
Environmental Practicum	V. Lagutov	3	NO
Sustainable Development & Global Transitions	L. Pinter	3	NO
Environment & Security *	S. Stec	2	NO: Cross-listed with IRES and School of Public Policy
Nature, Culture, Politics, & Justice *	G. Aistara	2	NO: Taught at PhD level. MSc students with social science or humanities backgrounds may be admitted with permission of instructor**.**
Global Food, Agriculture, & Development *	G. Aistara	4	NO: Cross-listed with Sociology and Social .Anthropology Dept.
Organic Gardening & Local Food Systems *	G. Aistara, L. Strenchcock	2	NO
MODULE: Environmental Management A	***A. Cherp***	***12***	**For *Environment, Policy, and Society* and *Environmental Management A* modules, min 12 credits for MESPOM and 10 for MESP students.**
Sustainable Energy Transitions	A. Cherp	3	NO
Energy Infrastructure: Management & Policy *	M. LaBelle	3	NO: Cross Listed with CEU Business School
Environmental Assessment & Planning	A. Cherp	2	NO
Introduction to Disaster Management *	V. Lagutov	2	NO
Carbon Reporting: Theory & Practice	R.Mnatsakanian, E. Tsvetkova	2	NO.

Course unit	Professor(s), coordinators	Course credits	Mandatory
MODULE: Environmental Research & Communication	***A. Watt***	***4***	**Min 2 credits for MESP**
Academic Writing for MSc Thesis	A. Watt	1	YES only for 1-year MESP students
Approaches to Social Research	T. Steger, M. LaBelle	1	YES for 1-year MESP students
Interpretive Research Methods	T. Steger	1	NO. Course Pre-requisite: *Approaches to Social Research*
Thesis Research Seminar & Workshop	A. Watt	1	NO

*** Semester 2A Course Registration Restrictions**

Please note that, due to timetable scheduling restrictions, some elective courses will run in parallel and course selection must correspond with these options:

Transnational Environmental Politics	***OR***	Environmental Modelling
Transnational Environmental Politics	***OR***	Spatial Analysis with ArcGIS
Environmental Politics: Environmental Activism & Communication	***OR***	Organic Gardening & Local Food Systems
Environmental Politics: Environmental Activism & Communication	***OR***	Introduction to Disaster Management
Global Food, Agriculture, & Development	***OR***	Environmental Governance: Advanced Topics
Nature, Culture, Politics, & Justice	***OR***	Energy Infrastructure: Management & Policy
Nature, Culture, Politics, & Justice	***OR***	Air Pollution & Climate Change
Organic Gardening & Local Food Systems	***OR***	Air Pollution & Climate Change
Environment & Security	***OR***	Visual Cultures of the Anthropocene

Semester 2b (Spring) MESPOM only	**[to be updated]**		
MODULE: Environmental Management B	***A. Cherp***	***18***	***Min 14-15 credits***
Assessment, Modelling & Scenarios for Ecosystems Management	P. Gaganis (& others)	**6**	YES
Sustainable Tourism	I.Spilannis (& others)	**2**	YES
Adaptive management & resilience of socio-ecological systems	L. Pinter, A. Shkaruba, A. Deri	3	NO
Professional Environmental Careers	A. Cherp	1	NO
Introduction to Sustainable Forestry	A. Shkaruba	2	NO
Constructing Energy Transition Scenarios with the Long Range Energy Alternatives Planning System (LEAP) software	A. Novikova, A. Kelemen, A. Cherp, V. Vinichenko	2	NO
Sustainable Energy Solutions	M. LaBelle	1	NO
Organic Gardening Practicum	G. Aistara	1	NO
Thesis Research Period (MESP only)			
MSc Thesis research, writing, & submission	varies	**16**	**YES**

Visiting faculty

Keith White, SEAES, The University of Manchester

David Sigee, SEAES, The University of Manchester

Andrius Plepys, IIIEE, Lund University

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

Jan Karlik, University of California, San Diego

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

Tibor Kovács, Hungarian Biodiversity Research Society

Anton Shkaruba, Erda Research, The Netherlands

Tiziana Centofanti, Corvinus University of Budapest

Alexandra Novikova, Institute for Climate, Energy and Mobility Research, Berlin

Ekaterina Tsvetkova

Stephen Stec

Maia and Reuben Fowkes, UK

Descriptions of individual courses and modules
Semester 1 (Fall)

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.

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 key skills and techniques necessary for effective written communication in the environmental field. 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 effectively apply standard techniques for written presentation of data, including referencing.

Educational activities, assessment and estimated workload

Learning outcomes	Assessment	Educational activities	Estimated workload (h)
Familiarity with standard techniques for written presentation of data in the environmental field. Ability to effectively apply standard techniques for written presentation of data in Masters assignments	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]

ICTs for Environmental Professionals

Lecturers/Instructors: Viktor Lagutov, Lorant Czaran (UN Office for Outer Space Affairs), TBA

Credits: 2

Duration: September-October

Pre-requisites: none

Course e-learning site: https://courses.ceu.edu/courses/information-and-communication-technologies-environmental-professionals

Aims, Objectives and Learning Outcomes

Information and Communication Technologies (ICTs) are widely used in environmental research and management including (but not limited to) data collection, storage, analysis and visualization, assessment of management scenarios and presentation of findings. The range of available technologies and software packages is wide and depends on issues concerned and level of computer literacy. The present course gives a brief introduction into some technologies of spatial data visualization (mapping). 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 acquiring practical mapping skills for different purposes (internet, journal publications, etc).

Optional modules on various ICT related topics will be offered. 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	5
Knowledge of GIS, cartography and data visualization principles	Class participation	Lectures	5
Getting practical skills on map creation, data visualization and spatial geo-referencing	Exercises	Computer-based seminars led by instructors, step-by-step exercises	10
Getting familiar with online satellite imagery / their products and applicability to environmental studies	Exercise	Computer-based seminars led by instructors, step-by-step exercises	10
Practical experience with mapping software, various mapping related techniques and tools	Integrated assignment	Self-study, Library/ Internet search and reading	14
Experience on independent maps development for integrated assignment	Final assignment	Computer-based Individual work, consultations	16
Total			**60**

Introduction to Environmental Sciences

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

Course e-learning sites:

NON-HUMAN BIOSPHERE: https://ceulearning.ceu.edu/course/view.php?id=5352

HUMANS AND THE BIOSPHERE: https://ceulearning.ceu.edu/course/view.php?id=5339

WATER RESOURCES MANAGEMENT: https://ceulearning.ceu.edu/course/view.php?id=5353

INTRO. TO QUANTITATIVE RESEARCH METHODS: https://ceulearning.ceu.edu/course/view.php?id=5347

INTEGRATED SCIENCES ASSIGNMENT: https://ceulearning.ceu.edu/course/view.php?id=5345

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 the principles and use of the scientific method in environmental sciences;
2. Understand 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.
3. Understand the key concepts of environmental impact at different scales and associated ecological issues at global, regional and local levels;
4. Know the purpose and key elements of environmental indicator frameworks, the ways indicators and indices can be used;
5. Identify key environmental issues associated with agriculture and food security issues and human health;
6. Understand the importance and major environmental issues related to water resources availability and use.
7. 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%)	Self E-Learning	8

Learning outcomes	Assessment	Educational activities	Estimated workload (h)
Understanding of energy and material flows in ecosystems	integrated 'science' assignment (60%)	Lectures & films	16
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 MANAGEMENT			
Understanding of basic facts and concepts related to water importance for life, of the 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)
Understand principles of the scientific method 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

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 Management

- Life on planet Earth is dependent on water.
- The unique physico-chemical properties of water.
- Current state of global fresh water resources. Main elements of the 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 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 constructions.
- Impact of water: floods and drought. Climate change impact on water availability.
- 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: 10/3/2016 to 10/11/2016

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: https://ceulearning.ceu.edu/course/view.php?id=5347

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

Introduction to Environmental Policy, Law & Thought

Coordinator: Alexios Antypas
Credits: 6
Lecturers/instructors: Alexios Antypas, (International Environmental Policy,1.5;
Student Policy Conference, 2)
Stephen Stec (International Environmental Law,1.5)
Alan Watt (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 and critically discuss key developments in the history of environmental attitudes and thought;
6. Understand and critically engage with major contemporary discourses on the environment;
7. 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
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			

Learning outcomes	Assessment	Educational activities	Estimated workload
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%)	Lectures and Discussion 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 and critically discuss key developments in the history of environmental attitudes and thought. Understand and critically engage with major contemporary discourses on the environment	Exam (100% of individual grade) Formative assessment of class debate (at group level)	Lectures Class debate Reading, debate preparation (optional tutorial)	6 2 13 (1)
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 Environmental Policy, Law & Thought (with Student Policy Conference-see below) (6 credits)			**156**

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

International Environmental Law

Lecturers/Instructors: Stephen Stec

Credits: 1.5

Duration: 11/11/2016 to 11/18/2016

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 assignment 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

Environmental Thought

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

Aims: The aim of this course is to familiarize students with major issues in environmental thought, both historically and through analysis of the main contemporary discourses about the environment. As well as developing their understanding of key historical developments and contemporary perspectives, students will have an opportunity to critically engage with some of these concepts in a class debate.

Key Topics: 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 Policy 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%

Introduction to Environmental Management

Coordinator	Aleh Cherp
Credits	6
Lecturers	Aleh Cherp, Introduction to Environmental Assessment and Management Andrius Plepys, Environmental Assessment for Products & Services Zoltan Illes, Introduction to Solid Waste Management

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 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)
2. Understand the purpose, key principles, and use of life-cycle assessment (LCA) and lifecycle think based environmental assessment methods for products and services
3. Understand the basic principles of environmental management systems in their relation to environmental and sustainability strategies and to broader management concepts.
4. Appreciate the challenges involved in managing people in various organizations and contexts.
5. Understand the key impacts associated with waste management as well as key principles of integrated waste management.
6. Understand the key energy concepts, terms and units. Know key facts related to global energy challenges (including environmental impacts of unsustainable energy production and consumption). 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
ENVIRONMENTAL ASSESSMENT & MANAGEMENT			
1, 3, 4, 6-8 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**
ENVIRONMENTAL ASSESSMENT OF PRODUCTS AND SERVICES			
2 from above	Class participation and exercise (40%) Exam (60%)	Lectures	12
		Exercise	30
		Reading and exam preparation	22
Subtotal for Environmental Economics			**64**
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

Learning outcomes	Assessment	Educational activities	Estimated workload
Subtotal for 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. 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?

Global energy challenges and energy transitions.

Environmental Assessment of Products and Services

The main objective 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 as well as their usage in organizational strategies.

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)

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 Science

Stream coordinator: R.Mnatsakanian

Air Pollution and Climate Change

Lecturers/Instructors: Ruben Mnatsakanian and John Karlik

Credits: 2 (elective)

Duration January To April

Pre-requisites: none

Course e-learning site: http://ceulearning.ceu.edu/course/view.php?id=4562

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 assignment based on real data of air pollution in their home country or 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 report Total hours	Evaluation of written assignment	**Lectures** Reading Assignment	16 12-14 12 40-42

Biodiversity & Conservation

Lecturers/Instructors: B. Anthony (+ guest speakers from SANParks, Budapest Zoo, CIC, and WWF-TRAFFIC)

Credits: 3 (elective)

Duration: 1/9/2017 to 2/1/2017

Pre-requisites: none

Course e-learning site: https://ceulearning.ceu.edu/course/view.php?id=6178

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/principles involved in conservation and learn about governmental and non-governmental efforts to protect biodiversity and develop sustainable practices to meet human needs. Media will include lectures, film, field trip to Budapest Zoo, and guest speakers.

<table>
<tr><th colspan="2">Learning Outcome(s)</th><th>Assessment</th><th>Activities</th><th>Est. Work-load</th></tr>
<tr><td rowspan="3">Foundational Knowledge</td><td>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;</td><td rowspan="8">Assn 1
LOs 1,5,8,10,11
40%

Assn 2
LOs 1-7,11-13,14,16,17
60%
<b>**Students also taking Environ-mental Monitoring can choose to do one larger individual assignment in either course which will count for both courses. Details will be provided by instructor.**</td><td rowspan="8">Lectures/ Exercises/ Films

Field Trip

Reading

Assignment 1

Assignment 2</td><td rowspan="8">26

4

20

12

13</td></tr>
<tr><td>Application</td><td>7. analyze options for biodiversity conservation;
8. measure and compare levels of biodiversity;
9. utilize the IUCN Species Red List;</td></tr>
<tr><td>Integration</td><td>10. prioritize sites for conservation;
11.evaluate conservation trade-offs;</td></tr>
<tr><td>Human Dimension</td><td>12. understand personal and social implications of conserving biodiversity;</td></tr>
<tr><td>Caring</td><td>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.</td></tr>
<tr><td>Learning How to Learn</td><td>17. continue learning re conservation;
18. critically engage in conservation debates.</td></tr>
<tr><td colspan="2">Total hours Click here to enter text.</td><td></td><td></td><td>75</td></tr>
</table>

Environmental Monitoring

Lecturers/Instructors: B. Anthony, T. Kovács (Hungarian Biodiversity Research Society)

Credits: 3 (elective)

Duration: 3/20/2017 to 3/31/2017

Pre-requisites: none

Course e-learning site: https://ceulearning.ceu.edu/course/view.php?id=6184

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. On-site habitat assessments will be complemented by quantitative field work using visual encounter surveys and the amphibian road call count method.

Learning Outcome(s)	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%) ****Students also taking *Biodiversity & Conservation* can choose to do one individual larger assignment in either course which will count for both courses. Details will be provided by instructor.**	lectures field exercise reading / listening to audial recordings group report writing	12 24 16 23
Total hours Click here to enter text.			75

Water Quality: Freshwater environments, human impacts and the provision of drinking water and sanitation

Lecturers/Instructors: Zoltan Illes, David Sigee

Credits: 3

Duration:

Pre-requisites: None

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

Aims, Objectives and Learning Outcomes

Water is a vital aspect of natural ecosystems and an important human resource. The physical, chemical and biological properties of water are considered in relation to aquatic environments, human impacts on freshwater systems (particularly eutrophication) and the provision of drinking water and sanitation. In many parts of the world, water is in limited supply, and we most develop sustainable approaches to its conservation and use.

Students attending the course will gain an understanding of diverse aspects of water quality, how these are monitored and how they affect our preservation and use of available supplies. The impact of human population increase on sustainable use of water resources is emphasised in relation to current pressures on natural freshwater systems, the effect of global warming and the increasing demand for drinking water and sanitation.

Learning Outcome	Assessment	Activities	Estimated Workload
Water quality parameters. Microbial diversity and freshwater management. Assessment of water quality in natural freshwater systems. Monitoring short- and long-term changes. Global warming. Human impacts – eutrophication. (a). Causes, results and control. (b) Monitoring and legislation. Water as a human resource. Range of uses, our water footprint. Provision of drinking water and sanitation	Written Exam	Lectures Consultation Self-study (reading) Exam preparation Field trip	20 10 22 13 8
Total hours			73

Marine Ecosystems

Lecturers/Instructors: Dan Cogălniceanu

Credits: 1

Duration: 6/2/2017 to 10/2/2017

Pre-requisites: None

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

Aims, Objectives and Learning Outcomes

The aim of this unit is to:

1. Understand the importance of marine systems, their diverse structure and functions, and the complex links between land and the ocean. 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.
2. 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, on the introduction of alien species, and on the impact of climate changes.
3. Understand the links between terrestrial and ocean systems. 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.
4. 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

Oil and Metal Pollution

Lecturers/Instructors: Keith White
Credits: Two credits, 48 hours
Duration: 1/13/2016 to 1/20/2016 May be subject to change
Pre-requisites: None
Course e-learning site: https://ceulearning.ceu.edu/course/view.php?id=6192

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 & assignment	Lectures & tutorials	8
4. Impact of oil on terrestrial, marine & freshwater ecosystems, fisheries & recreation	Examination		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		10
7. An awareness of methods & environmental impact of removing trace metals or oil released to marine & freshwaters & decontamination of soil	Examination & assignment	Lectures & tutorials	6
		Lectures & workshop	
		Lectures & workshop	
Total hours Click here to enter text.			48

Spatial Analysis with ArcGIS

Instructors	Viktor Lagutov, invited guest speakers (GIS practitioners)
Credits	4
Duration	11 weeks (January-March)
Software:	ArcGIS, Open Source GIS packages, Google Earth Pro, GPS

Prerequisites: ICT for environmental professionals

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 builds up on the practical skills in geospatial data mining and practical GIS skills obtained during the "ICT for environmental professionals" course. The course offers more detailed discussion of geospatial data visualization and introduces quantitative analysis of geospatial phenomena. An introduction to remote sensing methods based on satellite imagery is also given.

Educational Approach: The course consists of computer class-based instructor presentations, supervised in-class exercises, individual consultations and a major individual term project. The course is based on "learn-by-doing" approach: the principles and tools described during the laboratory-based presentations will be by accompanied by students' individual work in the class. Successful participation and completion of the course depends on student's ability for individual work and self-education. The class will incorporate quest lecturers by GIS practitioners (e.g. Google representatives).

Learning outcomes	workload, h
Theory of GIS and spatial analysis	10 10
Best practices and case studies in environmental GIS application	5
Practical skills in using GIS packages	10 10
Practical skills in retrieving and manipulating spatially referenced environmental data	10
Ability to carry out independent GIS-based research	30
Critical assessment of GIS activities	2
Familiarity with GIS applications usage and potential tasks	8
GPS Theory and practice	5
Total for the unit	100

Grading policy: 20% in-class exercises, 80% final project

The final project consists of exploring some environmental problem by means of ArcGIS software and reporting the findings and experience including: problem formulation, data collection and manipulation, results interpretation. The project can be a part of thesis or assignment for another course.

Limitations: The number of students is limited to 15

Environmental Modelling

Instructors	Viktor Lagutov, TBC
Credits	3
Duration	11 weeks (January-March)
Software:	STELLA, TBA packages for the case studies

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

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;
- formulate and analyse management strategies and scenarios.

Educational Approach

This course consists of laboratory-based lectures, readings, in-class exercises, homeworks, individual consultations and a major project (assignment). The course is based on "learn-by-doing" approach: basic ideas presented by instructors should be accompanied by substantial students' individual work. Students will develop understanding of complex environmental systems by constructing their own models using STELLA software. This user-friendly visual modelling package allows non-programmers and non-mathematicians to develop and run environmental models. Models could be based upon previous students' academic and professional background and can be used for thesis projects and other assignments.

Learning outcomes	workload, h
Introduction to environmental modelling	6
Modelling case studies	4
Introduction to STELLA software package	15
Practical modeling skills	35
Familiarity with modelling case studies and their critical assessment	15
Total hours	75

Grading policy: 20% homework, 70% final project; 10 % critical assessment

Limitations: The number of students is limited to 15.

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

Lecturers/Instructors: Ruben Mnatsakanian

Credits: 2

Duration: 1/12/2017 To 3/2/2017

Pre-requisites: None

Aims, Objectives and Learning Outcomes

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

- The role of particular resources 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

Environmental Pollution and Biological Remediation Methods

Instructor: Dr. Tiziana Centofanti (centofantit@spp.ceu.edu)

Credits: 2

Course description

The course offers an overview of problems related to degradation and pollution of terrestrial ecosystems with an emphasis on soil and water. Students will learn concepts related to soil and plant sciences, microbiology, water management and environmental conservation strategies. Practical aspects of remediation of degraded environments will be addressed and analyzed in details. In particular, we will explore the ecological and technical basis of green technologies, i.e. biological remediation methods. These methods comprise the use of organisms, such as plants and microorganisms, to remove and neutralize contaminants and to sustain ecosystem resilience and health. These methods have gained acceptance in the past 20 years as a cost-effective, non-invasive alternative or complementary technology to engineering-based pollution remediation methods.

Course outline

Class 1 Overview of soil and water contamination: where, how, who is affected?

Class 2 Introduction to risk assessment analysis

Class 3 Concepts of bioavailability and bioaccumulation

Class 4 Soil health and fertility

Class 5 The use of plants to treat soil degradation

Class 6 Water contamination, waste-water reuse and recycle

Class 7 Introduction to constructed wetlands for water pollution control

Class 8 Microorganisms: microbiology and biodegradation

Class 9 The use of microorganisms to treat environmental pollution

Class 10 Combined use of plants and microorganisms to treat environmental pollution: ecological revitalization

Class 11 Ecosystem services derived from biological remediation methods

Class 12 Students' presentations

Learning outcomes

- Analyze the impact of soil and water pollution on ecosystems and humans.
- Apply the concepts of bioavailability and bioaccumulation.
- Apply the concepts of degradation, transformation and recycling of organic and inorganic elements (i.e., pesticides, heavy metals).
- Analyze multi-scale phenomena from plant cells to terrestrial ecosystems.
- Examine the economic and social benefits/limitations of biological remediation methods.
- Analyze case studies and acquire an understanding of the complexity of what constitutes pollution remediation.

Assessment

Requirement	Percent of course grade
Participation in class	40
Class presentation	20
Final exam	40

Environment, Policy and Society

Stream Coordinator: Alex Antypas

Transnational Environmental Politics: The Water, Food & Energy Nexus

Lecturers/Instructors: A. Antypas, L. Pinter

Credits: 3

Duration: January to March 2017

Pre-requisites: None

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 and international relations 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 natural resource 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, to formulate and coherently present arguments	Participation and contribution to the discussion of readings (40%) Group work – case study and presentation (30%) Final paper (30%)	Lectures / discussion Reading Group work - case studies Final paper	28 28 14 15
Total hours			85

Global Food, Agriculture, and Development

Lecturers/Instructors: Guntra Aistara

Credits: 4 credits, cross-listed with Sociology / Social Anthropology

Duration: 1/9/2017 to 4/5/2017

Pre-requisites: none

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

Aims, Objectives and Learning Outcomes
The fields of food and agriculture are inherently interdisciplinary, as they integrate the large-scale politics of agricultural policy-making with the cultural specificity of taste; farmer agricultural practices with their environmental and social impacts; local knowledge systems with academic research findings. Therefore this course is cross-listed between two departments and will explore the ecological and socio-cultural aspects of farming systems, agricultural politics, and food cultures throughout history in various regions of the world.

This course is divided into four parts: agricultural history, development discourses, alternative agriculture systems, and food cultures. Each section includes both theoretical readings that can be used to analyze various aspects of food and agricultural systems and critical anlyses of in-depth case studies. Readings cover social, cultural, environmental, and political aspects of various inputs, farming practices, and rural development strategies.The first section will trace the history of agrarian change, beginning with the neolithic revolution, to the establishment of “traditional” food and agricultural systems, through to the Green Revolution. The second part of the class focuses on understanding debates surrounding agricultural development, aid, trade, and subsidies. We will investigate current controversies such as land grabbing, land sparing, GMOs, and property rights on seeds. This will culminate in a mid-term exercise of a simulation of agricultural negotiations in the European Union. The third part of the course critiques alternative agricultural systems, such as organic, fair trade, local food, and food sovereignty movements, and the types of changes in the status quo that ecah does or does not bring about. The final part of the class will explore the relationship between social, cultural, political, and ecological determinants of taste and food as culinary heritage. We will explore the relationships between food cultures and political regimes, historical memories, cultivation practices, geographic and ecological conditions, nutrition and diet, certification standards, national policies, and processes of globalization. The final assignment will to write an analytical research paper on a topic related to class readings.

Please note that this is a reading-based discussion seminar (rather than a lecture) and plan your schedule accordingly.

Learning Outcome	Assessment	Activities	Estimated Workload
Develop broad understanding of ecological, social, political and cultural issues related to agriculture, development, and food systems	Class attendance and participation, 15%	Class attendance; participation in discussion	38 hours
Evaluate and critique academic literature on agricultural sustainability, politics, and food and agriculture movements	Critical reading and moderation and participation of discussions online and in class (25%)	Class readings, critical reflection, and preparation of discussion questions	38 hours
Understand the complexities of controversial issues and be able to present arguments from various perspectives	Negotiation exercise, 25%	Preparation and participation in simulation	16 hours
Formulate one’s own informed opinion on relevant issues, analyze them theoretically, and present them in a written final paper	Final paper 35%	Research and writing for final paper	18 hours
Total hours			110 Hours

Nature, Culture, Politics, and Justice

Lecturers/Instructors: G. Aistara

Credits: 2, Taught at PhD level; Master's students with social science or humanities backgrounds may be admitted with permission of instructor

Duration: 1/1/2017 to 4/15/2017

Pre-requisites: MA degree or Permission of instructor (please contact by email)

Maximum class size: 10

Course e-learning site:

Aims, Objectives and Learning Outcomes

This course will explore the historical evolution of the study of nature-culture relations. It will serve as an introduction to political ecology and environmental justice as historically and culturally grounded theoretical approaches for studying the nested social and political causes and consequences of conflicts over access to natural resources. Particular attention will be given to thinking critically about how postcolonial power dynamics persist in Global North-South relations and continue to structure uneven development and environmental conflicts. Readings will draw upon the fields of anthropology, sociology, and geography. It will draw heavily on ethnographic explorations of nature-culture interactions, and will allow PhD students to develop their theoretical frameworks for their dissertations.

The course will include both theoretical readings and ethnographic case studies applying approaches from political ecology, environmental justice, post-colonialism, new materialities, and others. Case studies will include topics such as such as indigenous relations to nature; extractive industry conflicts with communities; land, forests, and livelihoods; neoliberal models of conservation; political ecology; and climate change. We will read all or part of several recent book-length ethnographies.

Each of the studied case studies will examine how nature, environment, justice, etc. are defined in culturally specific ways by communities, activists, social movements, governments, and private sector actors. Students will study how negotiations among stakeholders reach much beyond simple calculations of compensation to fundamental understandings of landscapes, property, community, or democracy. Students will learn to critically analyze environmental conflicts and social movement strategies through a broader cultural and political lens, and to consider the complexity of perspectives, politics, and power dynamics that influence outcomes. For the final project, each student group will pick one case related to their research in which to analyze the interconnectedness of social, environmental, and political problems and nature-culture connections.

Please note that this is a heavy reading-based discussion seminar, and plan your time accordingly.

Learning Outcome	Assessment	Activities	Estimated Workload
Ability to discuss complex interconnections of social and political causes and consequences of environmental problems	Class attendance and participation, 25%	Class attendance; participation in discussion	18 hours
Ability to critically engage theoretical and case study literature	Submission of reading responses, presentation of selected readings and cases, 25%	Class readings, critical reflection, and preparation of responses and discussion questions	18 hours
Be able to analyze the complexity of environmental problems and apply selected theoreical frameworks	Final research project 50%	Select literature from class and outside materials for analysis	14 hours
Total hours			50 Hours

Organic Gardening and Local Food Systems

Lecturers/Instructors: Guntra Aistara, Logan Strenchock

Credits: 2

Duration: January- March, 2017

Pre-requisites:

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

Aims, Objectives and Learning Outcomes

This course will be both a theoretical and practical introduction to agroecology and organic gardening techniques. It will include an overview of soil management, crop rotation, companion planting, and pest management, urban composting techniques, and local food systems. It will include a brief overview of different philosophical approaches to organic management practices, such as permaculture, biodynamic, and biointensive techniques. The students' main task will be to make a garden design plan for the spring CEU rooftop garden, justifying their choices, thus integrating various aspects of the theory they have learned. Students will also sign up for volunteer sessions to manage the first steps in planting the rooftop garden, including starting seeds, transplanting, watering, etc.

The course will also feature various guest speakers and field trips related to understanding the historical and contemporary development of local food systems in Hungary, particularly in and around Budapest. Students will have a chance to meet with Budapest farm, garden, and market managers and hear about the challenges they face. There will also be training sessions held on the Zsambok organic farm (near Godollo), managed by Matthew Hayes, Logan Strenchok and colleagues.

Learning Outcome	**Assessment**	**Activities**	**Estimated Workload**
Understand and farming techniques, and the complexities and challenges of managing small organic garden or participating in a local food system	Class attendance 15% Journal reflection 15%	Class hours Class reading and writing of reflection journals	12 12
Create a functional garden design, including crop selection, crop rotation, and soil and pest management elements	Garden design, 35%	Group work for garden design	12
Apply and reflect upon basic practical organic gardening techniques	Volunteer and field work and blog entries 30%		14
Total hours			50

Visual Cultures of the Anthropocene

Lecturers/Instructors: Dr. Maja Fowkes, Dr. Reuben Fowkes

Credits: 2

Duration:

Pre-requisites: None

Aims, Objectives and Learning Outcomes

This course examines the impact of the Anthropocene, considered both as a new geological epoch marked by human interventions in the Earth System and as a theoretical tool for understanding how we experience and represent the natural world, through analysis of current debates around ecological crisis and in light of the evolving role of artists in visualizing planetary issues. Students will examine a wide range of contemporary art practices, in addition to insights from visual culture, performance arts and literature, addressing environmental concerns from the consequences of climate change to engagements with bio-diversity and sustainable lifestyles. Along with lectures and seminar discussions, this environmental humanities course will involve encounters with multiple art forms and contemporary cultural sources, as well as offer an opportunity to develop critical skills and broaden the response to ecological questions.

Learning Outcome	Assessment	Activities	Estimated Workload
Knowledge of key issues within current thinking about the Anthropocene.	Class participation	Lectures, seminars	14
A critical grasp of the influence of arts and culture on environmental discourse.	Written assignment	Reading, lectures	8
Understanding of the extent to which awareness of ecological crisis is changing culture and society.	Class participation	Reading, seminars	14
Using environmental theories in an inter-disciplinary context.	Written assignment	Reading, seminars	12
Working collaboratively to conceive and execute a research project.	Team project	Seminars	12
Total hours			60

Final grade for the course is based on one written assignment (50%), one team project (30%) and class participation (20%).

Environmental Governance: Advanced Topics

Lecturers/Instructors: Alex Antypas

Credits: 4

Duration: Winter Semester

Pre-requisites: None

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

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**

Environmental Philosophy

Lecturers/Instructors: Dr. Alan Watt

Credits: 2

Duration 1/11/2017 To 3/29/2017

Pre-requisites: None

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

Aims, Objectives and Learning Outcomes

To explore some of the major themes in contemporary environmental philosophy. Key objectives are to develop an understanding of some of the major concepts and issues at stake in environmental philosophy, and 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 philosophical and ethical concepts 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 Click here to enter text.			53-5

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

Environmental Politics: Environmental Activism and Communication

Lecturers/Instructors: Tamara Steger

Credits: 4

Duration 1/11/2017 To 3/29/2017

Pre-requisites: None

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

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 based on environmental communication theory. 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

Sustainable Development and Global Transitions

Lecturers/Instructors: Prof. Laszlo Pinter
Credits: 3
Duration: 1/26/2016 to 3/25/2016
Pre-requisites: none
Course e-learning site: http://ceulearning.ceu.edu/course/view.php?id=6195

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. Perspectives from sustainability science 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, with an explicit link to the sustainable development goals (SDGs) and related implementation mechanisms. 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 and a field trip to an eco-village. A course assignment will focus on identifying a small set of illustrative SDGs for two countries and developing and contrasting ideas for implementation strategies.

Learning Outcomes	**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 (40%) Presentation of assignment (20%)	Lecture and seminars Reading Assignment Field trip	12 24 20 16
Total hours			72

Environmental Practicum

Credits	3
Coordinator	Viktor Lagutov
Duration	11 weeks (January-March)

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 and report experience. The ideas for internship placement are also welcome from other CEU departments or student professional contacts.

Educational Approach

The course consists of 1) professional activities at host organization, 2) interim group discussions with course participants undertaking internships at other institutions; 3) consultations with supervisors 4) submitting progress reports and making final public presentation of internship achievements and relevance. Specific timeframe, deliverables and milestones are defined by the internship plan endorsed by the department and a host organization.

Learning Outcome	Workload
Fostering communication skills in professional arena and workflow planning	5
Practical hands-on environmental experience Getting acquainted with professional communities	65
Presentation, writing and communication skills in a specific professional area (vocabulary, etc)	5
Total hours	75

The internship progress and experience will be facilitated by interim and final reports. The Practicum is concluded with public presentation on internship achievements, challenges, feedbacks, etc. Students must be able to communicate their experience to other course participants.

Grading policy:

The course allows enrollment along the 2 tracks:

- for grade. In this case the 3 course credits will be counted towards the 22 minimum credits.

- for pass/fail. the course credits will NOT be counted towards minimum credits.

The grade is based on successful completion of all three course stages: 1) internship proposal development; 2) interim evaluations (progress reports confirmed by internship supervisors); 3) final report.

Please note that the course requirements are the same for both tracks: you have to successfully complete internship and report your experience.

Limitations: The number of students is limited by internship placements and faculty availability.

Environment and Security

Lecturers/Instructors: Stephen Stec

Credits: 2

Duration: Jan – April 2017

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 SPP. The course examines the nexus between environment and security in several dimensions – environmental governance as a security concern; conflict resources; protection of the environment in conflict; environment as an arena for cooperation, avoidance of conflict, and post-conflict confidence-building; environmental modification in war.

Learning Outcome	Assessment	Activities	Estimated Workload
1. Become familiar with the concepts, definitions and narratives in the field based on readings and lectures 2. Conduct research into environment and security with respect to a particular topic 3. Be able to critically evaluate trends and concepts and apply knowledge gained in the course to concrete issues	Class attendance and participation Written assignment	Seminars Reading Written assignment	20 20 20
Total hours			60

Policies for Sustainable Transport (not offered this AY)

Lecturers/Instructors: Zoltan Illes (on sabbatical in 2016-2017 AY)

Credits: 2

Duration: not offered this year

Environmental Management

Stream coordinator: A.Cherp

Sustainable Energy Transitions

Lecturers/Instructors: Aleh Cherp

Credits: 3

Duration: 6/2/2017 To 3/31/2017

Course e-learning site: http://ceulearning.ceu.edu/course/view.php?id=6196

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 especially for understanding the potential for sustainable energy transitions.

Learning Outcome	Assessment	Activities	Estimated Workload
1. Understand the key concepts and principles of energy system analysis 2. Understand environmental and sustainability impacts of energy systems 3. Understand and be able to use the techno-economic, the socio-technical and the political perspectives on national energy transitions	Participation and presentations 20% Individual assignment 80%	Lectures Readings Seminars and presentations Preparing written assignment	16 15 6 50
Total hours 56			87

Energy Infrastructure: Management and Policy

Lecturers/Instructors: Michael LaBelle

Credits: 3

Duration: 2/1/2017 To 4/1/2017

Pre-requisites: none

Course e-learning site: http://ceulearning.ceu.edu/course/view.php?id=4739

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. *Student led teams will work on projects connected to a company, organization or institution.* Interviews, policy research and business strategies will all be analysed with a real company or organization in mind. The aims are:

- 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
- Operations of the emission trading schemes and accounting
- Cross-disciplinary approach to education and how multiple perspectives join in the policy and business realm

2016/17 Preliminary Academic Partners: Ethanol Europe, CEU, Siemens

Learning Outcome	**Assessment**	**Activities**	**Estimated Workload**
Collaborative experience and new perspective on the linkage between environmental protection and business operations	3 page group case study (max 1500 words), 20% of grade	report	10 hours
Research and analysis skills. Greater ability to conduct research, organize data and analyze potential business or policy approaches.	4- 5 page case study – with a story line (max 2,000 words), 50% of grade	report	31 hours
Communicate within project teams and with external audience research and analysis, including the process.	Blogs and presentations, 20% of grade	Report and presentation	10
Class and lectures	attendance	lectures	24 hours
Total hours			75

Environmental Assessment and Planning

Lecturers/Instructors: Aleh Cherp

Credits: 2

Duration: 2/2/2016 To 3/31/2016

Pre-requisites: Introduction to Environmental Management

Course e-learning site: http://ceulearning.ceu.edu/course/view.php?id=6181

Aims, Objectives and Learning Outcomes

The aim of this course is to develop students' knowledge and skills in predicting and evaluating environmental impacts of planned activities. The course has a special emphasis on environmental impact assessment (EIA) and strategic environmental assessment (SEA) but also covers elements of environmental planning.

Learning Outcome	Assessment	Activities	Estimated Workload
1. Know key techniques of EIA and SEA 2. Be able to review quality of EIA, SEA, and sustainable development planning documents 3. Be able to prepare professional reports and presentations in the field of EA and planning	Individual presentations and class participation 20% Individual assignment 80%	Lectures Readings Presentations and seminars Individual assignment	8 8 6 30
Total hours Click here to enter text.			52

Carbon Reporting: Theory & Practice

Lecturers/Instructors: Ruben Mnatsakanian, Ekaterina Tsvetkova
Credits: 2
Duration: 1/11/2015 To 3/1/2015
Pre-requisites: 'none'
Course e-learning site: http://ceulearning.ceu.edu

Aims, Objectives and Learning Outcomes

This course aims to provide students with general understanding of international emissions trading mechanisms and processes that are commonly known as "carbon finance" and its working principles. 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 mandatory (compliance) trading and reporting and, on the other hand, voluntary activities and schemes. It will broadly cover the largest regulatory trading mechanisms including but not limited to GHG protocol (global), European Union Emissions Trading Scheme (EU), Environment Protection Agency's Mandatory Reporting Rule (US), National Greenhouse and Energy Reporting (Australia), Accord de Branche (Belgium), Grenelle (France), Carbon Reduction Commitment (UK).

Students will be exposed to the business realities of the modern Sustainability function of an organization, the challenges companies face while trying to comply with carbon regulations as well as costs of having an "active corporate position" on this topic. 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 EU ETS emissions of an organization via real-life simulation exercise.

The purpose of this course is mainly to facilitate the development of business 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.

Learning Outcome	Assessment	Activities	Estimated Workload
Ability to calculate emissions of an organization as part of the EU ETS; understanding of the Linking mechanism and financial implications of swaps	EU ETS Practical Take Home Exercise (either individual or in groups), 35% of total grade	In class presentation, real-life simulation, take home assignment	Real life simulation – preparation time up to 2 hrs; in-class presentation up to 30 mins; take-home assignment up to 3 hrs
Understanding of the basics of the corporate sustainability reporting according to the main standards – CDP, GRI and DJSI	Individual take-home assignment to evaluate historical risks & opportunities and write up current sections of the report – 35% of total grade	Take home assignment	Take home assignment – up to 4hrs
Gaining general knowledge of emissions trading fundamentals and give an overview of key components of the so-called "carbon finance"	Class participation – 20 + 10% of the grade	Seminars & in class learning	In class participation + required readings
Understanding of the major international and regional regulatory and voluntary trading and reporting schemes	Class participation – 20 + 10% of the grade	Seminars & in class learning	In class participation + required readings
Total hours			In class 12 hrs

Introduction to Disaster Management

Lecturers/Instructors: Viktor Lagutov, invited guest speakers: Armen Grigoryan (UNDP), Lorant Czaran (UNOOSA), Kinga Perge (Hungarian National Directorate General for Disaster Management), Ruben Romero (IFRC), TBA

Credits: 2
Duration: January-March
Pre-requisites: none
Number of students: 15
Course e-learning site: http://ceulearning.ceu.edu

Aims, Objectives and Learning Outcomes

Modern societies nowadays in many ways can be determined by existing and anticipated risks. Natural and technological hazards affect the everyday life as well as long-term development plans. While technological disasters are triggered by human error, negligence or even intent, changing environment can intensify the consequences or broaden the scale of such events. In case of natural disasters it is impossible to avoid all risks, they can be mitigated to some extent, but at some point, communities have to accept and adapt to potential hazards. For many decades the reactive approach in dealing with disasters (focus on response and recovery) prevailed, yet lately the shift to broader pre-disaster actions to minimize the disaster risks is encouraged. The presented course gives an introduction to the Disaster Risk Management, focusing on natural disasters, providing comprehensive understanding of the links between natural and social components of the issue. Starting from the theory, main definitions and concepts, the course then presents other aspects of the problem, like International Agreements, impacts of climate change and urbanization on the severity and extent of disasters, case studies of disaster management on national and local levels, some existing supporting technologies. These topics will be covered by practitioners from the corresponding international or national organizations.(e.g. UNDP, Red Cross, WMO)

Learning outcomes	workload (h)
Understanding foundations of hazards, disasters and associated natural/social phenomena	5
Being Familiar with disaster management theory (cycle, phases)	5
Knowledge about existing global frameworks and existing agreements (e.g. Sendai)	5
Methods of community involvement as an essential part of successful DRR	7
Humanitarian Assistance before and after disaster	4
Technological innovations in DRR: Advantages and problems	6
Exposure to practical national disaster management activities	4
Experience on conducting independent DM study including data search, analysis and presentation of disaster case study	24
Total	**60**

Course Assessment

The evaluation is based upon student's performance using the following two criteria:

- ***Class participation (20%):*** active student participation in class discussions is expected and encouraged; evidence of reading the assigned texts; minor home tasks.
- ***Final individual written assignment and project presentation (80%)*:** course project in form of a case study, assessing the country's (or region's or city's) current disaster management system, in context of a recent natural disaster event (5,000 words). Preparing final project presentation (15').

Environmental Research and Communication

Stream coordinator: A.Watt

Thesis Research Seminar and Workshop

Lecturers/Instructors: A. Watt

Credits: 1

Duration: Winter Semester (March-April)

Pre-requisites: None

Only available to 1-year MSc and 2nd year MESPOM (Max 15; priority to 1-year MSc students)

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 structured, mentor-facilitated setting. The purpose of this course is to provide a productive intellectual community forum to strengthen and tailor knowledge, understanding, skills and confidence relevant for designing and executing a master's 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 suitable research question, theoretical and conceptual framework, and method. A workshop format is used, involving submission of relevant elements from students' own thesis research work prior to class, and review of peers' submissions. The course is for pass/fail and due to its workshop format is only available to students on the one-year MSc and 2nd year MESPOM students, i.e. those already with active thesis research projects.

Learning Outcome	Assessment	Activities	Workload (est.)
Understand how key features of high quality MS level thesis research relate to the student's own thesis project Develop constructive criticism skills in relation to peer research projects Incorporate peer and mentor criticism into the thesis research	Attendance and active participation at workshop classes, including constructive criticism of peer research projects; Submission of required short thesis-related assignments ahead of classes	Workshop classes Reading Preparation and submission of short assignments prior to class Review of peer assignments prior to class	8 3 10-13 4-6
Total Hours:			25-30

Approaches to Social Research

Lecturers/Instructors: Tamara Steger and Michael LaBelle

Credits: 1

Duration: Winter

Pre-requisites: none (THIS COURSE is a pre-requisite for Interpretive Research Methods.)

Course e-learning site: http://ceulearning.ceu.edu/course/view.php?id=4779

Aims, Objectives and Learning Outcomes:

This course is designed to help students build a critical epistemological base and a practical understanding of research in the social sciences. Through seminars, readings, exercises, and assignments on the principles of social science research and some of their key epistemological orientations, students gain a richer understanding of the scientific method and some of its principles and applications.

This course aims to provide students with a knowledge base and understanding for both conducting and evaluating research in the social sciences, particularly in the context of environmental problems and phenomena. More specifically, the course is designed to prepare students for doing thesis research at the master's level.

Learning Outcome	Assessment	Activities	Estimated Workload
A critical understanding of key epistemological orientations in the social sciences as they relate to scientific methods.	In-class writing assignment (25%)	Interactive lecture; small group discussion; and in-class writing assignment	varies
Strengthened critical thinking skills	Critical thinking writing (and presentation) exercise (25%)	Lecture and select presentations	varies
Capacity to develop a preliminary research design and explore appropriate methods for conducting thesis research.	Poster presentation (50%)	Presentation on theses.	varies
Total hours			25

Interpretive Research Methods

Lecturers/Instructors: Tamara Steger

Credits: 1

Duration: Winter

Pre-requisites: **Approaches to Social Research**

Course e-learning site: http://ceulearning.ceu.edu/course/view.php?id=4776

Aims, Objectives and Learning Outcomes

This course is important for all students who intend to use qualitative research methods in their thesis research. This course is specifically geared toward understanding how people define and understand environmental problems and, therefore, how they approach or seek to address these problems. It will allow students to practice participant observation, developing an interview protocol, conducting, transcribing, coding and analyzing interviews and interpreting their data.

The course will cover the following:

- Participant observation and ethnographic field notes
- 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 a solid interview protocol
- Conducting an in-depth interview to maximize rich data collection
- Analyzing data

Learning Outcome	**Assessment**	**Activities**	**Estimated Workload**
Be able to think critically about interpretive data collection and analysis	Class attendance and participation, 25%	Class attendance; participation in discussion; class readings	17 hours
Ability to conduct participant observation for ethnographic fieldwork	Field journal entry, 20%	Field notes	2 hours
Know how to prepare and conduct an in-depth interview to maximize data collection	Interview protocol, 10%, Partial interview transcript 15%	Prepare interview protocol; conduct interview; transcribe interview	3 hours
Understand how to analyze interview data	Coding and Analysis, 25%	With a partner prepare summary of preliminary codes and categories, and their possible relationships; present to class.	3 hours
Total hours			25 Hours

Academic Writing for MSc Thesis

Lecturers/Instructors Alan Watt

Credits: 1

Duration: 1/22/2015 To 4/15/2015

Pre-requisites: None Insert name of course(s) if any or 'none'

Course e-learning site: http://ceulearning.ceu.edu/course/view.php?id=4560

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. Each of the 6 classes looks at writing issues related to a separate element of the MS thesis: the thesis proposal; the introduction; literature review; methods; main body; conclusions, recommendations and abstract. The unit is run on a pass/fail basis.

At the end of this unit a successful student should:

Knowledge and understanding	*1. Be familiar with the key structural components of theses and research papers in the field*
Intellectual skills	*2. 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

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

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.

Assessment, Modelling and Scenarios for Ecosystems Management

Coordinator: P. Gaganis

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

ECTS Credits: 6

Duration: 5/22/2017 to 6/16/2017

Pre-requisites: none

Course e-learning site: https://aegeanmoodle.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) (40%) 2. Evaluation of group assignment and presentation (60%)	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

Sustainable Tourism

Coordinator: I. Spilanis

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

ECTS Credits: 2

Duration: 6/19/2017 to 6/30/2017

Pre-requisites: none

Course e-learning site: https://aegeanmoodle.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			60

Adaptive Management and Resilience of Socio-ecological Systems

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

Credits: 3

Duration: April 19-27, 2017

Pre-requisites: None

Course e-learning sit: to be confirmed

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, scenario building, ecosystem modelling 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 Understanding of uncertainties associate with data and models, ability to parameterise and run a model for ecosystem vulnerability analysis 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 (30%) Ecosystem modelling and vulnerability analysis (20%) Final paper (30%)	Lectures and discussions Modelling exercise Reading Research and writing of course paper Paper presentation	16.6 6 24 15 3.3
Total hours Click here to enter text.			64.9

Professional Environmental Careers

Lecturers/Instructors Aleh Cherp

Credits: 1

Duration: 5/3/2015 To 5/4/2016

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: 1

Duration: April-May 2017

Pre-requisites: None

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

Aims, Objectives and Learning Outcomes

Description

Climate change is forcing society, institutions and companies to take up new energy technologies. This course explores how the evolutions of the past energy system places the development of new energy technologies in a long curve of energy transitions. Central to the course is understanding the development of energy technologies can enable new technologies to be deployed at a faster rate. Students will learn about how policy approaches enable the deployment of new energy technologies.

Aims, objectives and learning outcomes

1. Critically analyse 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

Learning Outcome	Assessment	Activities	Estimated Workload
Terms and definitions used in the energy sector Awareness of the evolution of energy systems and policy making Integration of how new energy technologies integrate into energy systems Difference between developed and developing countries' energy systems	Group presentation 20% Clean Tech Policy Paper 80%	Classroom hours Optional tutorials Readings Group project participation Clean tech policy paper	8 hours 3 hours 5 hours 2 hours 6 hours
Total hours 24			**24**

Introduction to Sustainable Forestry

Lecturers/Instructors: Anton Shkaruba

Credits: 2

Duration: May 2-12, 2017

Pre-requisites: None

Course e-learning site: http://ceulearning.ceu.edu/course/...

Aims, Objectives and Learning Outcomes

This course will introduce students to key theoretical and practical elements of forestry in Northern Eurasia and North America, including principles of contemporary silviculture, approaches to forest management planning and management tools, forest inventories and predictions, management of ecosystem services, forestry policies and politics, and forest governance issues, such as multiple stakeholder involvement, certification, climate and biodiversity policies. A particular attention will be paid to the management under uncertainties, associated with climate change, and interplays between various forestry targets and values (e.g. timber harvesting, tourism, game management, biodiversity conservation, carbon sequestration etc).

Learning Outcome	Assessment	Activities	Estimated Workload
Understanding concepts, methodology and tools used in forestry and management of forest ecosystems	Participation and reading presentations (20%)	Lectures and discussions	16
Understanding various policy and management contexts and common problems of contemporary forestry in North America and Northern Eurasia	Group work – case study and presentation (40%)	Reading	16
Ability to conceptualize and frame forestry-related issues, find related literature and data, interpret data, use the concepts, tools an methods covered in the course, and draw policy/management relevant conclusions	Final paper (40%)	Research and writing of course paper	12
Total hours 44 hours			44

Organic Gardening Practicum

Lecturers/Instructors: Guntra Aistara, Logan Strenchock

Credits: 1

Duration: April 18 To May 19, 2017

Pre-requisites: Organic Gardening and Local Food Systems (or Food, Agriculture, & Development or permission of instructor)

Course e-learning site: Moodle site

Aims, Objectives and Learning Outcomes

This course will be a practical continuation of the Organic Gardening and Local Food Systems class. We will practice agroecology and organic gardening techniques at a farm in Zsambok (near Godollo), as well on the rooftop garden. Students' main task will be to design and organize on-campus volunteer sessions for other CEU community members. We will focus on soil management, composting, seeding, sowing, and transplanting, crop rotation, companion planting, and weed and pest management.

Learning Outcome	Assessment	Activities	Estimated Workload
- *understand key organic gardening and farming methods;*	Class attendance, field work 30%	Class hours and field trip	16
- *apply basic practical organic gardening skills, and share and teach gardening techniques to others.*	Design volunteer sessions 30%; Blog entries 20%	Outside reading and volunteer work	6
- *comprehend the complexities and challenges of managing a small organic market farm, and teaching gardening techniques to others.*	Journal reflection 20%	Writing of blog and reflections	3
Total hours			25

Constructing energy transition scenarios with the Long Range Energy Alternatives Planning System (LEAP) software

Instructors: Dr. Alexandra Novikova (Institute for Climate, Energy and Mobility Research, Berlin), Agnes Kelemen (CEU) (support from Prof. Aleh Cherp, Vadim Vinichenko)

ECTS credits: 2

Duration: 25/04/2017 - 11/5/2017

Pre-requisites and requirements: Sustainable Energy Transitions or Energy Infrastructure course in Winter Semester. Students must bring their own laptops with LEAP software installed[2]. Max number of students: 15.

Aims, Objectives and Learning Outcomes

Students will learn how to develop a baseline and several energy transition scenarios for the electricity sector and a selected end-use sector of a case study country using the LEAP software.

Learning Outcome	Assessment	Activities	Estimated Workload
4. understanding of energy system concepts concepts (e.g. baseload power plant, merit order, useful energy analysis, etc.) which are necessary for preparing energy scenarios 5. general understanding of how to develop scenarios depicting energy transitions, inlcuding interpreting the results of the scenarios by performing sensitivity analysis, cost-benefit analysis, analysis of import dependency, etc. 6. knowledge of the use of the LEAP[3] software	Class participation and individual model exercise (Pass/Fail)	Lectures Seminars (in class) Individual work with LEAP	10 14 24
Total hours Click here to enter text.			56

[2] The software is free of charge for all academic institutions and students in several low income countries, including Hungary

[3] www.energycommunity.org/LEAP/

Industrial Waste Management and Pollution Control (not offered this AY)

Lecturers/Instructors: Zoltan Illes (on sabbatical in 2016-2017 AY)

Credits: 3

Duration: not offered this year