COURSE DESCRIPTION

1. GENERAL

SCHOOL	SCHOOL OF ENVIRONMENT, GEOGRAPHY AND APPLIED ECONOMICS		
DEPARTMENT	GEOGRAPHY		
LEVEL OF COURSE	POST-GRADUATE		
COURSE CODE		**SEMESTER**	1st
COURSE TITLE	ENVIRONMENTAL CHANGE: OBSERVATION AND PREDICTION		
STRUCTURE OF TEACHING ACTIVITIES		**TEACHING HOURS PER WEEK**	**NUMBER OF CREDITS ALLOCATED (ECTS)**
Lectures and Laboratory Classes		2	7,5
TYPE OF COURSE	Elective Generic knowledge, Specialization, Skill development		
PREREQUISITES	-		
LANGUAGE OF INSTRUCTION	Greek		
COURSE OFFERED TO ERASMUS STUDENTS	Yes – in English (upon request)		
(URL)			

2. EXPECTED LEARNING OUTCOMES

Learning outcomes

Describe the objectives of the course as well as the expected learning outcomes

The course of Observation and Prediction of Environmental Change aims to introduce the students to the basic notions of environmental change, and the methods used to assess and predict change.

The objectives of the course are dual: i) it aims at supporting the students with theoretical knowledge on the notions of environmental change and its assessment and prediction; ii) and providing them with the necessary knowledge and tools to assess, measure and predict change. The ultimate goal of the course is to use the above-mentioned knowledge towards a more informed decision-making and change management.

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

- **Know** the types of environmental change and **use** the theoretical knowledge to assess the interactions between human activities, natural processes and the impacts on the environment
- **Recognize** the types of environmental change: climate change, introduction of invasive alien species, biodiversity loss, land use change, policy change etc.
- **Explain** the concepts of adaptation and resilience across space and time
- **Describe** the basic methods of environmental change observation
- **Explain** and **interpret** the outcomes of existing environmental change models in order to use them for decision making
- **Use** models of observation and prediction of environmental change for at least

three different types of change and/or systems (e.g., marine, terrestrial)
- **Assess** the challenges and opportunities that emerge from the use of those methods and the consequences of their use in the decision making process.

General Skills

Search, analysis and synthesis of data and information, with the use of relevant technology
Decision making
Group work
Work in an international environment
Work in interdisciplinary setting
Respecting the natural environment
Self and peer-review
Free, creative and inductive thinking

3. COURSE CONTENTS

1. Types of environmental change, natural processes and ecosystem services
2. Anthropocene, social-ecological systems, planetary boundaries, carrying capacity
3. Adaptation and resilience
4. Methods of observation and assessment of environmental change (field work, earth observation, participatory mapping)
5. Environmental change indicators – basic principles of development, use and interpretation
6. Models of environmental change – the modelling process
7. Use of simple models of description and prediction (agent-based modelling, Bayesian belief networks) in different systems (marine, terrestrial)
8. Scenaria of future global change (e.g., IPCC)
9. Criteria of comparison and selection of methods and models for change observation and prediction.

4. TEACHING AND ASSESSMENT METHODS

TYPE OF LECTURES	Face to face: In the classroom and the lab (PC)
ICT USE	Use of the ICT software for lectures and seminars as well as content sharing. Use of freeware for practical / lab exercises
TEACHING STRUCTURE	

Activity	***Hours per semester***
Lectures	26
Laboratory	20
Tutorials	20
Seminars / Invited talks	6
Group project	45
Studying – personal work	64
TOTAL	***181***

ASSESSMENT METHODS	Language of assessment: Greek (English upon request) Assessment Methods • Written group assignment (70%) • Oral presentation (20%) • Peer review (10%)

5. RECOMMENDED READING

Rockström et al (2009). Planetary Boundaries: Exploring the Safe Operating Space for Humanity. Ecology and Society, 14, 2.

Van Oudenhoven et al (2018). Key criteria for developing ecosystem service indicators to inform decision making. Ecological Indicators, 95, 417-426.

Nelson et al (2007). Adaptation to Environmental Change: Contributions of a Resilience Framework. Annual Review of Environment and Resources, 32, 395-419.

Stritih et al (2020). An online platform for spatial and iterative modelling with Bayesian Networks. Environmental Modelling & Software, 127, 104658.

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