

MODULE DESCRIPTION

General

School	Geotechnical Sciences
Department	Forest and Natural Environment Sciences

Module Information

Title	Environmental Modelling
Course Code	Opt.32
Level of Studies	Undergraduate
Teaching Period	Autumn Term
Attendance Type	Elective Compulsory
Prerequisites	Ecostatistics

Orientation	Weekly Hours		Year	Semester	ECTS
	Lectures	Laboratory work			
ECOLOGY AND BIODIVERSITY CONSERVATION	2	1	5	9	3

Faculty Instructor

PANTELEIMON XOFIS

Type of Module

- General Foundation
- Specific Foundation / Core
- Knowledge Deepening / Consolidation

Mode of Delivery

- Face to face
- Distance learning

Digital Module availability

- E-Study Guide
- Departments Website
- E-Learning

Language

	Teaching	Examination
Greek	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
English	<input type="checkbox"/>	<input type="checkbox"/>

Erasmus

- The course is offered to exchange programme students

Learning Outcomes

The aim of the course is the introduction to the basic principles of modelling the parameters that affect the operation of ecosystems and the landscape, with emphasis on spatial models. The course will provide advanced knowledge of ecostatistics and geostatistics that will allow the student to search for and analyze complex relationships that are formed in a system and affect the function and processes in it. Basic methods that will be taught, through examples with real research and experimental data, are the Regression and Classification Trees, Linear Regression, Logistic Regression etc. Upon completion of the course students will be able to understand the theory of niche and distributions and their connection to mathematical modeling methods. To apply the above modeling methods but also additional methods such as models of maximum entropy (MAXENT).

List of General Competences

- Apply knowledge in practice
- Work autonomously
- Work in teams
- Work in an international context
- Work in an interdisciplinary team
- Respect natural environment
- Advance free, creative and causative thinking

Module Content (Syllabus)

- Introduction to Environmental Modelling
- Distributions and normality tests in ecological data
- Ordination methods (PCA, CA, DCA, CCA)
- Introduction to Regression - Generalized Linear Models (GLM)
- Species distribution modeling (SDM) and niche ecological analysis
- Distribution modelling applications and understanding - integrating uncertainties into the modeling process
- Maximum Entropy Models (MAXENT)

Educational Material Types

- Book
- Notes
- Slide presentations
- Video lectures
- Multimedia

- Interactive exercises
- Other:

Use of Information and Communication Technologies

- Use of ICT in Course Teaching
- Use of ICT in Laboratory Teaching
- Use of ICT in Communication with Students
- Use of ICT in Student Assessment

Module Organization

Please fill in the workload of each course activity

Course Activity	Workload (hours)
Lectures	26
Laboratory work	13
Field Trip/Short Individual Assignments	20
Independent Study	16
Total	75

* 1 ECTS unit corresponds to 25 hours of workload

Student Assessment Methods

- Written Exam with Multiple Choice Questions
- Written Exam with Short Answer Questions
- Written Exam with Extended Answer Questions
- Written Assignment
- Report
- Oral Exams
- Laboratory Assignment

Suggested Bibliography (Eudoxus and additional bibliography)

1. Gray, W. G., Gray, G. A. (2017) Introduction to Environmental Modelling. Cambridge University Press
2. Franklin, J. (2010) Mapping Species Distributions: Spatial Inference and Prediction (Ecology, Biodiversity and Conservation). Cambridge University Press