COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Environment		
ACADEMIC UNIT	Department of Environment		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**133KEY**	**SEMESTER**	**7**
COURSE TITLE	ECOSYSTEM DYNAMICS		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	2	
Laboratory	1	
Total credits		**3**

COURSE TYPE	Skills development
PREREQUISITE COURSES:	-
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	-
COURSE WEBSITE (URL)	http://www.env.aegean.gr/spoudes/proptychiakes-spoudes/programma-spoudon/dynamiki-oikosystimaton/

(2) LEARNING OUTCOMES

Learning outcomes
On successful completion of the course students should be able to demonstrate understanding of: 1. The importance of models in understanding ecosystem dynamics 2. The meaning and use of plant functional traits 3. The flows of energy, water, carbon and nutrients in plants and ecosystems 4. The biotic relationships between plants and their importance for ecosystem dynamics 5. Temporal vegetation changes and interactions with disturbances 6. Spatial vegetation changes Additionally, students will be able to: 7. Quantify and use basic ecosystem variables 8. Use R to apply some fundamental analysis of ecosystem data
General Competences
Search for, analysis and synthesis of data and information, with the use of the necessary technology

Adapting to new situations
Team Work
Working independently
Integration of theory with practice

(3) SYLLABUS

Theory

1. Introduction: Systems, Models and Ecosystem Dynamics
2. Describing Individuals ab Species: Plant Functional Traits and Strategies
3. Allometry – Stoichiometry -Scalling
4. Fluxes f Energy and Water in Plants and Ecosystems
5. Fluxes of Carbon in Plants and Ecosystems
6. Nutrients in Plants and Ecosystems
7. Competition, Facilitation and Assembly Rules
8. Regeneration and Mortality / Vegetation Change and Disturbances
9. Spatial patterns and Species Distribution Models
10. Temporal Patterns and Ecosystem Dynamics Models

Field Work

At least one visit at a permanent study plot, where students make biometric and plant growth measurements. These data are subsequently used in the lab for data analysis

Lab Work (Data Analysis and code development)

Lab1 Empirical modelling of net primary productivity
Lab2 Allometry and plant trait covariation
Lab3 A simple mechanistic model of ecosystem productivity
Lab4 Species distribution modelling and climate change projections

The aim of the field and lab work is to familiarize students with:

- some basic ecosystem measurements in the field
- the development of theoretical models of species distribution and dynamics
- the integration of field measurements with ecological models

the use of model to project the effects of climate change on biodiversity

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY.	Face-to-face,
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Use of ICT in teaching, laboratory education, communication with students
TEACHING METHODS	

Activity	***Semester workload***
Lectures	30
Laboratory practice	12
Fieldwork	8
Essay writing	40

	Study	60
	Course total	***150***
STUDENT PERFORMANCE EVALUATION	Labwork 4 essays – code development [40%] Exams short-answer questions [40%] problem solving [20%]	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Chapin III, Matson & Vitousek (2011). Principles of Terrestrial Ecosystem Ecology

- Related academic journals:

Ecological Modelling
Global Change Biology
Ecosystems