COURSE OUTLINE

1. GENERAL INFORMATION

FACULTY/SCHOOL	**SCHOOL OF PLANT SCIENCES**		
DEPARTMENT	Faculty of Crop Science		
LEVEL OF STUDY	Undergraduate		
COURSE UNIT CODE	2300	**Semester:**	**6º**
COURSE TITLE	**QUANTITATIVE ECOLOGY TOPICS**		
INDEPENDENT TEACHING ACTIVITIES *in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits*		**WEEKLY TEACHNG HOURS**	**ECTS**
		3h Theory + 2h Lab	5
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail under section 4			
COURSE TYPE *Background knowledge, Scientific expertise, General Knowledge, Skills Development*	*Scientific expertise*		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION:	Greek		
LANGUAGE OF EXAMINATION/ASSESSMENT:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://oeclass.aua.gr/eclass/courses/EFP144/		

2. LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:

Among the objectives of the course, students who successfully complete it will:

- Understand the significance of Ecology as a science and its contribution to modern society.
- Acquire knowledge of methods for studying population dynamics and interactions using electronic computers and models.
- Familiarize themselves with various research methods applied in Ecology, such as sampling, population size estimation, species biodiversity assessment, etc.
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APPENDIX A

- *Description of the level of learning outcomes for each level of study, in accordance with the European Higher Education Qualifications' Framework.*
- *Descriptive indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and*

APPENDIX B

- *Guidelines for writing Learning Outcomes*

General Competences

Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?

Search for, analysis and synthesis of data and information by the use of appropriate technologies,	*Project planning and management*
Adapting to new situations	*Respect for diversity and multiculturalism*
Decision-making	*Environmental awareness*
Individual/Independent work	*Social, professional and ethical responsibility and sensitivity to gender issues*
Group/Team work	*Critical thinking*
Working in an international environment	*Development of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Introduction of innovative research	*(Other……citizenship, spiritual freedom, social awareness, altruism etc.)*
	…….

The course aims to develop the following general skills:

- Respect for the natural environment.
- Design and management of projects.
- Support in the decision-making process for managing animal populations.
- Promotion of work in an international environment.
- Promotion of work in an interdisciplinary environment.
- Encouragement of free, creative, and inductive thinking.

3. COURSE CONTENT

1. Sampling methods. Estimation of optimal sample size. Applications and practical examples.
2. Methods for estimating population size and dispersion of animals. Marking - Release - Recapture. Multiple marks - recaptures. Successive sampling.
3. Resampling methods (Bootstrapping, Jackknifing, randomization, Monte Carlo) - Applications in ecology.
4. Analysis of population fluctuations - "key factors."
5. Dynamics of species population interactions - advanced models (Ricker, Hassell, Beverton-Holt, etc.). Spidergram analysis. Analysis of species population interactions using the program Populus. Applications.
6. Dynamics of metapopulations. Metapopulation subunits and risk of extinction. Empirical examples.
7. Species diversity - components. Alpha-beta-gamma diversities. Species richness indices (Margalef, Menhinick), evenness indices, and diversity indices (Simpson, Shannon-Wiener, Hill, etc.).
8. Similarity of biotic communities. Ecological data matrices. Quantitative and qualitative data. Cluster analysis - Dendrograms. Principal component analysis.
9. Organism spatial arrangements - their ecological significance. Testing the randomness of spatial arrangements. Examples from nature.
10. Spatial relationships between species. Diversity and spatial arrangement.
11. Ecological topics of free choice by students. Indicative fields: Deep Ecology // Carnivorous plants - ecological significance // Animal cannibalism - ecological significance // Epiphyte ecology // Cave ecology // Animal communication / Invasive species // Organisms of extreme conditions // Ecotourism // etc..

4. TEACHING METHODS--ASSESSMENT

MODES OF DELIVERY *Face-to-face, in-class lecturing, distance teaching and distance learning etc.*	In the amphitheater.

<table>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY
Use of ICT in teaching, Laboratory Education, Communication with students</td><td>Use of PowerPoint and video

Communication with students through:
✓ email,
✓ the e-class website,
✓ the Open class platform, and
✓ the announcements website of the Agricultural University of Athens: http://tdd.aua.gr/announcements/main</td></tr>
<tr><td>COURSE DESIGN
Description of teaching techniques, practices and methods:
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, Internship, Art Workshop, Interactive teaching, Educational visits, projects, Essay writing, Artistic creativity, etc.
The study hours for each learning activity as well as the hours of self-directed study are given following the principles of the ECTS.</td><td>
<table>
<tr><th>Activity/ Method</th><th>Semester workload</th></tr>
<tr><td>Theory lectures</td><td>13 weeks</td></tr>
<tr><td>Laboratory lectures</td><td>13 weeks</td></tr>
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<tr><td>Total number of teaching hours:</td><td>65 hours</td></tr>
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STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS *Detailed description of the evaluation procedures:* *Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short- answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work,* *other……etc.* *Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students.*	I. The evaluation language is Greek. II. From the beginning of the semester, students are given the opportunity to choose an ecologically relevant topic in consultation with the instructor, which they present during the course. Their presentation is evaluated by both the instructor and fellow students through a special evaluation questionnaire. III. The grade in theory is determined either by the final written exam or by the presentation of a topic by the student, or by a combination of both. IV. Exams in theory may consist of short essay questions. V. For the Laboratory, an exercise related to the theory is sent via email on a weekly basis, different for each student. Students are required to solve the exercise and return it to the instructor via email. The grade in the laboratory is determined either by the weekly exercises or by a final exam that involves solving exercises using open books and notes.

5. SUGGESTED BIBLIOGRAPHY:

- Recommended Bibliography:
  - "Ecological Methods - From Theory to Practice" by M.G. Karandeinos.
- Relevant Scientific Journals:
  - Journal of Ecology
  - Oikos

6. TEACHERS:

Professor Costas SAITANIS