



COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Technology		
ACADEMIC UNIT	Department of Environmental Sciences		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	AE811	SEMESTER	8th
COURSE TITLE	MOLECULAR ECOLOGY		
INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS		CREDITS
Teaching Hours		3	3
COURSE TYPE	Special background		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/ENV_U_168		

(2) LEARNING OUTCOMES

Learning outcomes
<p>The main purpose of the course is to promote the students' understanding of ecology and the relationship of organisms with their environment. Particular emphasis will be placed on the use of new methodological tools in the study of the evolution of organisms and their interaction with the environment.</p> <p>Upon successful completion of the course, students will be able to:</p> <ul style="list-style-type: none">• Understand the methodology - how we approach molecular ecology research.• Comprehend current ideas about the origin and evolution of life.• Recognize the special importance of mitochondrial DNA.• Understand the role of mutations in ecology and evolution.• Determine the diversity in nature at the molecular level.• Understand how the horizontal transfer of genetic information occurs.• Assess the application of molecular techniques to environmental samples.• Comprehend how we can recover genetic information from fossils and museum specimens.• Critically analyze results presented in scientific journals.
General Competences
<ul style="list-style-type: none">• Searching, analyzing and synthesizing data• Decision making• Autonomous Work• Teamwork• Respect for the natural environment• Exercise criticism and self-criticism• Promotion of free, creative and inductive thinking

(3) SYLLABUS

<ul style="list-style-type: none">• Introduction to molecular ecology• Genomes and genetic markers• Molecular Identification• DNA sequencing• Gene expression analyses• Species, populations and individuals• Environmental DNA• Ancient DNA

- Epigenetic
- Population Genetics
- Phylogeography
- Phylogenomics
- Speciation
- Transcriptomics
- Proteomics
- Metabolomics

(4) TEACHING and LEARNING METHODS – EVALUATION

DELIVERY	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	<ul style="list-style-type: none"> • Use of PowerPoint slides • View material in video • Communication with students via e-mail • Use of asynchronous distance learning (e-class) 	
TEACHING METHODS	Activity	Semester workload
	Lectures	39
	Study and analysis of bibliography	12
	Project	24
	Course total (25 hours workload per credit)	75
STUDENT PERFORMANCE EVALUATION	<p>Students' performance is evaluated in the Greek language. The final grade is determined by:</p> <ul style="list-style-type: none"> • A written exam (at the end of the semester) that contributes 70% to the final grade and includes one or more of the following assessment methods: Multiple-Choice Test, Short Answer Questions, and Problem-Solving. • The elaboration of an individual project (in the 2nd half of the semester) that contributes 30% to the final grade. The individual project may be presented by the students in class. <p>Final Grade = 70% Exam Grade + 30% Assignment Grade</p>	

(5) ATTACHED BIBLIOGRAPHY

- Baker, Allan J. (Editor) (2000) *Molecular Methods in Ecology*, Blackwell Science Inc.
- Desalle, Rob & Schierwater, Bernd (eds) (1998) *Molecular Approaches to Ecology and Evolution*. Publisher: Birkhouse.
- Pianka, E. R. (2006) *Evolutionary Ecology*. (6th edition). Heraklion: Crete University Press. (in Greek)
- Rowe, G., Sweet, M., & Beebee, T.J.C. (2022) *Principles of Molecular Ecology*. Nicosia: Broken Hill Publishers Ltd. (in Greek)