COURSE OUTLINE

(1) GENERAL

SCHOOL	NATURAL SCIENCES		
ACADEMIC UNIT	BIOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BIO_ΣΤΕ7	**SEMESTER**	6/8
COURSE TITLE	**ADVANCED TOPICS IN BOTANY**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	WEEKLY TEACHING HOURS	CREDITS
Lectures, seminars, and Multimedia displays	2	6
Laboratory work & exercises	3	
Educational field–work	1 daily excursion	
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Field of Science
PREREQUISITE COURSES:	The students should possess basic knowledge provided through the previously taught theoretical courses 'Plant Biology', 'Ecology' and 'Evolution'
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek. Teaching may be however performed in English in case foreign Erasmus students attend the course.
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	**https://eclass.upatras.gr/courses/BIO357/**

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

By the end of this course the student will be able to:

1. Understand the basic principles and processes of speciation, as well as the reasons underlying the creation of endemism, diversity and biogeographical patterns on a global and local scale
2. Understand the fundamentals of conservation biology and the relevant risk categories of the rare, protected, threatened and endangered plant taxa
3. Understand how many endemic plant taxa exist in Greece, if there are any endemic diversity

hotspots in Greece, where are these hotspots located and the reasons why they were created

4. Distinguish the rare, threatened and protected plant taxa of Greece
5. Handle the most recent and widely used protocols for the monitoring of rare, protected and endangered species
6. Perform a Population Viability Analysis, as well as to determine the size of the Minimum Viable Population
7. Estimate the extinction risk of rare, endemic and protected plant taxa via a Species Distribution Modelling framework
8. Apply the ecological principles in environmental assessment and management of environmental issues
9. Evaluate the biodiversity conservation as well as the climate change results in ecosystems and natural environment
10. Strengthen their efficiency to compile information in a coherent system/unit

At the end of this course the student will have further developed the following skills/ competences:

1. Ability to demonstrate knowledge and understanding of essential facts, concepts, principles and theories of Ecology, Evolution, Conservation Biology and Biogeography
2. Ability to apply such knowledge and understanding to the solution of ecological issues
3. Ability to interact with others on environmental multidisciplinary problems
4. Study skills needed for continuing professional development

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Generally, by the end of this course the student will, furthermore, have develop the following general abilities (from the list above):
Adaptation to new situations
Decision making
Autonomous (Independent) work
Group work
Exercise of criticism and self–criticism
Promotion of free, creative and inductive thinking
Respect to natural environment
Work design and management

(3) SYLLABUS

Plant speciation and endemism patterns – Reproductive isolation mechanisms – Categories of endemic taxa – Endemism indices

Causes of plant speciation and relevant patterns in Greece – Altitudinal endemism – Refugia in time and space

Plant diversity patterns at the global and local scale

Plant diversity in Greece – Richest families, their morphological characteristics and most prominent representatives

Natural and Anthropogenic extinctions – Causes and consequences of climate change on plant diversity at the global and local scale

Extinct, Rediscovered and Newly–Described Greek endemic plant taxa – Top–50 rare Mediterranean plants – Distribution of the Greek endemic, rare, endangered and protected plant taxa

History, principles, values and ethics of Conservation Biology – Global Strategy for the Conservation of plant diversity

International Union for the Protection of Nature (IUCN) – Red Data Book – Rare, Threatened and Endangered Endemics of Greece – Risk categories – Rarest Greek endemic plant taxa – Greek endemic plant taxa facing extinction

The Legal Foundations of Conservation Biology – National and International Legislation for the protection of plant taxa – Current plant protection status in Greece – Relevant examples

Protocols for the monitoring of rare, protected, threatened and endangered species of the Greek flora – Relevant examples

Population conservation biology - Basic concepts - Population Viability Analysis - Using PVA to identify the possible threats in situ populations are facing - Causes of population decline and response strategies - Minimum Viable Population - Invasive species and other threats

Conservation actions for the endemic, rare, threatened and protected plant taxa - Ex situ & in situ conservation - Impact of management actions - Guidelines for the implementation of conservation actions

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Lectures, seminars and laboratory work face to face.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Use of Information and Communication Technologies (ICTs) (e.g. powerpoint) in teaching.
Support of the learning process through the e–class platform. A series of pdf files, containing each week’s lecture, is uploaded in the aforementioned platform; thus, the students can have easy and free access to the lecture notes.
The students learn innovative statistical techniques via the R programming language and the freeware R–Studio application</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures (2 conduct hours per week x 13 weeks)</td><td>26</td></tr>
<tr><td>Field work</td><td>8</td></tr>
<tr><td>Laboratory exercises (3 conduct hours per week x 13 weeks)</td><td>39</td></tr>
<tr><td>Optionally, preparation of home–works from groups of two or three students each</td><td>21</td></tr>
<tr><td>Bibliographical search and study</td><td>20</td></tr>
<tr><td>Hours for private study of the student and preparation of home–works and reports, for the Laboratory, and preparation for the Laboratory (study of techniques and theory)</td><td>36</td></tr>
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<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>150 hours (total student work–load)</td></tr>
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<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>Written examination of weekly Laboratory exercises (80%)

Preparation and Presentation of group work (20%)</td></tr>
</table>

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Whittaker, R.J. & Fernández–Palacios, J.–M. **2009**. Island biogeography. Ecology, evolution and conservation. Oxford University Press]

Primack, R.B. **2014**. Essentials of Conservation Biology. 6th ed. Sinauer Associates Inc.

Morris, W.F. & Doak, D.F. **2002**. Quantitative conservation biology. Theory and practice of population viability analysis. Sinauer Associates Inc.

Walker, T. **2013** Plant conservation. Why it matters and how it works. Timber Press.

Thompson, J.D. **2005**. Plant evolution in the Mediterranean. Oxford University Press.

Gibson, D.J. **2015**. Methods in Comparative Plant population Ecology. 2nd ed. Oxford University Press.

Allendorf, F.W., Luikart, G. & Aitken, S.N. **2013**. Conservation and the genetics of populations. 2nd ed. Wiley–Blackwell.

Bramwell, D. & Caujapé–Castells, J. **2011**. The biology of island floras. Cambridge University Press.

Stuessy, T.F. & Ono, M. **1998**. Evolution and speciation of island plants. Cambridge University Press.

Cody, M.L. **2006**. Plants on Islands. Diversity and dynamics on a continental archipelago. University of California Press.

van Dyke, F. **2010**. Conservation Biology. Foundations, Concepts, Applications. 2nd ed. Springer.

Leadlay, E. & Jury, S. **2006**. Taxonomy and Plant conservation. Cambridge University Press.

Ladle, R.J. & Whittaker, R.J. **2011**. Conservation Biogeography. Blackwell Publishing Ltd.

Primack, R.B. **2012**. A Primer of Conservation Biology. 5th ed. Sinauer Associates Inc.

- Related academic journals:

Lecture notes in Greek [E–class Advanced topics in Botany] – (BIO357, https://eclass.upatras.gr/courses/BIO357/)