

COURSE OUTLINE

(1) General information

FACULTY/SCHOOL	TECHNOLOGY		
DEPARTMENT	ENVIRONMENTAL SCIENCES		
LEVEL OF STUDY	<i>Undergraduate</i>		
COURSE UNIT CODE	NEW COURSE	SEMESTER	1 th
COURSE TITLE	INTRODUCTORY BIOLOGY		
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	CREDITS	
THEORETICAL BACKGROUND	3	3	
LABORATORY PRACTICE	2	2	
TOTAL	5	5	
COURSE TYPE Background knowledge, Scientific expertise, General Knowledge, Skills Development	BACKGROUND		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION & EXAMINATION/ASSESSMENT:	GREEK		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p><i>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:</i></p> <p>APPENDIX A</p> <ul style="list-style-type: none"> • 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 <p>APPENDIX B</p> <ul style="list-style-type: none"> • Guidelines for writing Learning Outcomes
<p>GENERAL BIOLOGY provides the basic background for the successful attendance of a number of modules of the Environment's Curriculum. The module aims to introduce students to basic knowledge of Cytology, with an emphasis on the concepts of plant cell organization and plant organization. The main cellular and subcellular structures, the types of plant cells, tissues, as well as the morphology and anatomy of the main plant organs are taught. Also, the structure of all plant parts and organs of the plant are analyzed in full, which serves all the basic physiology functions of plants, such as photosynthesis, cellular respiration,</p>

water circulation and respiration. The student will understand how the plants react to different environmental conditions, especially the impact of the environment on the functional organization of plant structures, in the context of plant growth and their role in ecosystems.

The **laboratory part** of the course provides the opportunity to develop laboratory skills and gain laboratory experience and knowledge, necessary for the successful attendance of a number of modules, of the study program..

The aim of the course is for students to be able to:

1. To understand the basic principles and concepts of Biology, with emphasis on the basic concepts of the organization of the plant organism.
2. Recognize and understand the main cellular structures and the most important types of plant cells and be familiar with the basic anatomy and morphology of plant organs.
3. Understand basic functions of plant physiology (photosynthesis, cellular respiration, respiration, etc.).
4. To apply the knowledge gained in the course, in other modules of the program related to Geology, Ecology, etc.
5. Use an optical microscope and other basic laboratory instruments and produce fresh samples of various plant organs (leaf, root, stem, flower, etc.).
6. To meet the requirements of the "Good Laboratory Practice" in subsequent Laboratory courses of the study program of the Department or other undergraduate or postgraduate study programs.
7. Evaluate, analyze and calculate laboratory measurement data and write laboratory reports.
8. To apply the knowledge they will acquire in the module, in order to solve today's environmental problems.

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, Adapting to new situations Decision-making Individual/Independent work Group/Team work Working in an international environment Working in an interdisciplinary environment Introduction of innovative research

Project planning and management Respect for diversity and multiculturalism Environmental awareness Social, professional and ethical responsibility and sensitivity to gender issues Critical thinking Development of free, creative and inductive thinking (Other.....citizenship, spiritual freedom, social awareness, altruism etc.)

- Search, analyze and compose data
- Decision making
- Autonomous Work
- Teamwork
- Respect for the natural environment
- Practice criticism and self-criticism
- Promoting free, creative and inductive thinking

(3) COURSE CONTENT

Theory:

1. Introduction to the Biology of plant organisms - Basic properties of life - Variety of plant organisms - The role of plants in the ecosystem and the environment.

2. Prokaryotic and Eukaryotic cell. Differences between plant and animal cell.
3. The structure and organization of the eukaryotic plant cell - Cellular organelles - Subcellular structures.
4. Categories of plant cells - History of Vascular Sperm (Angiospermae) - Categories of plant tissues.
5. Cell cycle - Cell division (mitosis-reduction).
6. Organization of the plant body: The structure and function of the leaves. External morphology and internal organization of the leaf. Special leaf types
7. The structure and function of the root and stem. Primary and secondary growth- Transformation of shoots.
8. The structure and function of the flower - External morphology and Internal organization of the flower. Approach and ways to pollinate.
9. Reproductive Biology of plants. Fertilization. Fruit - Sperm. Sperm structure and function. Seed viability, Dormancy and germination - Phytohormones.
10. Photosynthesis - Photosynthetic pigments
11. Cellular respiration - Aquatic movement of plants - Breathing.
12. Growth direction - Environmental stimuli (phototropism, gravitationalism, daily rhythms - seasonal changes (Photoperiodism, irrationalization)
13. Environmental stress on plants - Adaptations of plants to the Mediterranean environment. Plant anti-pollution role.

Laboratory:

1. General Biology - Laboratory organization.
2. Microscope - Principles of microscopy.
3. Microscopic preparations (temporary and permanent) - preparation techniques
4. Cell - Cell Organisms.
5. Cytology (Observation of onion bulb skin cells) - Observation of nuclei in animal cells (epithelial).
6. Plasmolysis of onion cells by staining - Aqueous relations.
7. Microscopic observations of leaves, leaf mouths and chloroplasts.
8. Microscopic observations of plastids (chloroplasts, chromoplasts, leukoplasts, amyloplasts and proteinoplasts).
9. Tiny root observations (monocotyledonous and dicotyledonous plants).
10. Microscopic shoots (monocotyledonous and dicotyledonous plants)
11. Structure and function of the flower.
12. Fruits - seeds - dormancy - germination (reproduction and dispersal of plants).
13. Review - presentation of work.

(4) TEACHING METHODS-ASSESSMENT

MODES OF DELIVERY Face-to-face, in-class lecturing, distance teaching and distance learning etc.	<ul style="list-style-type: none"> • Lectures in the classroom or by distance • Experimental work in the lab. 														
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY Use of ICT in teaching, Laboratory Education, Communication with students	<ul style="list-style-type: none"> • Powerpoint. • e-mail. • e-class 														
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.	<table border="1" style="width: 100%;"> <thead> <tr> <th style="background-color: #e1e1e1;"><i>Activity/Method</i></th> <th style="background-color: #e1e1e1;"><i>Semester workload</i></th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td style="text-align: center;">39</td> </tr> <tr> <td>Workshop</td> <td></td> </tr> <tr> <td>Laboratory work</td> <td style="text-align: center;">26</td> </tr> <tr> <td>Theory study</td> <td style="text-align: center;">47</td> </tr> <tr> <td>Weekly individual evaluation reports for laboratory exercises</td> <td style="text-align: center;">13</td> </tr> <tr> <td>Course total</td> <td style="text-align: center;">125</td> </tr> </tbody> </table>	<i>Activity/Method</i>	<i>Semester workload</i>	Lectures	39	Workshop		Laboratory work	26	Theory study	47	Weekly individual evaluation reports for laboratory exercises	13	Course total	125
<i>Activity/Method</i>	<i>Semester workload</i>														
Lectures	39														
Workshop															
Laboratory work	26														
Theory study	47														
Weekly individual evaluation reports for laboratory exercises	13														
Course total	125														

<p>The study hours for each learning activity as well as the hours of self-directed study are given following the principles of the ECTS.</p>	<p>(25 hours of workload per credit unit)</p>	
<p>STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS Detailed description of the evaluation procedures:</p> <p>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.</p> <p>Specifically, defined evaluation criteria are stated, as well as if and where they are accessible by the students.</p>	<p><u>Appraisal in theory</u></p> <ul style="list-style-type: none"> • Written exams • Written exams in theory is permitted only after the completion of the laboratory exercises. • The grade participates by 70% in the final grade. <p>The appraisal in the lab includes:</p> <ul style="list-style-type: none"> • Completion of the laboratory exercises program • Delivery of written report for each laboratory exercise (A) • Written exam (B) <p style="text-align: center;">Lab grade: 20% (A) + 80% (B)</p> <p style="text-align: center;"><u>Final grade</u></p> <p style="text-align: center;">70% Theory grade + 30% Lab grade</p>	

(5) SUGGESTED BIBLIOGRAPHY:

<p><u>-Suggested bibliography:</u></p> <ol style="list-style-type: none"> 1..Aevalakis G., Karabourniotis G. & Fasseas K., 2005, Αϊβαλάκις, Γ. Καραμπουρνιώτης, Κ. Φασσέας. 2005. General Botany (Morphology, Anatomy and Physiology of Higher Plants, Emryo Publications, Athens (in Greek) 2. Lincon Taiz, Eduardo Zeiger, Ian Max Moller, Angus Murphy (in Greek by K. Thanos). Plant Physiology and Development, 6th edition, 2nd in Greek, 2017, Utopia Publications. 3. Raven P.H., Johnston G.B., Losos J.B., Mason K.A. & S.R. Singer 8th ed., McGraw-Hill. 2008. Biology. 4. Starr, C., Evers C. & Starr L. 2014. Biology: Concepts and Applications. Utopia Publications. 5. Tsekos I. 2005. Botany. (Structure, Functionality and Biology of Plants, Publisher Kyriakides Bros SA 6. Vardavakis M. & Zouzoulas D., 2003. Morphology and Anatomy of Plants, ZITI Publications, Thessalokini. \ <p><u>-Complementary bibliography:</u></p> <p>Lecture notes and the full material of the lectures and introductory presentations of the workshops, are available through the asynchronous training platform</p>
--