**COURSE OUTLINE**

1. **GENERAL**

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| **SCHOOL** | School of Health Sciences |
| **ACADEMIC UNIT** | Department of Biological Applications and Technology (BET) |
| **LEVEL OF STUDIES** | Undergraduate |
| **COURSE CODE** | **ΒΕΥ303** | **SEMESTER** | **3rd** |
| **COURSE TITLE** | Anatomy and Morphology of Plants |
| **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 and Laboratory exercises | 6 | 6 |
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| *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* | Special background |
| **PREREQUISITE COURSES:** |  |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | Greek |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | Yes (in Greek only) |
| **COURSE WEBSITE (URL)** | http://ecourse.uoi.gr/enrol/index.php?id=641 |

1. **LEARNING OUTCOMES**

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| **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*
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| Plant Anatomy and Morphology refers to how plants are structured at a micro- and macroscopic level. Upon successful completion of the course, the student will be able to:* know how plants are structured from micro- to macroscopic level
* understand how structure is related to the corresponding plant functions
* understand that the structure-function relationship has occurred during development
* understand how the structure-function relationship harmonizes and reflects to the different plant habitats
* use the optical microscope as a tool for observing the plant world

make simple miniature herbal preparations |
| **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* *Adapting to new situations* *Decision-making* *Working independently* *Team work**Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas*  | *Project planning and management* *Respect for difference and multiculturalism* *Respect for the natural environment* *Showing social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism* *Production of free, creative and inductive thinking**……**Others…**…….* |
| Autonomous workTeamworkWorking in an interdisciplinary environmentProducing new research ideasRespect for the natural environment |

1. **SYLLABUS**

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| **. Theory**1. **Plant cell:** Plasma membrane, Cytoplasm, Nucleus, Ribosomes, Endoplasmic reticulum, Golgi apparatus, Mitochondria, Plastids, Microsomes, Cytoskeleton, Vacuole, Cell wall.
2. **Tissues:** Parenchyma, Supportive, Epidermal, Secretory, Conductive, Periderm – Lenticels, Meristems.
3. **Stem:** External morphology, Primary growth, Secondary growth, Metamorphoses.
4. **Leaf:** External morphology, Gymnosperm leaf anatomy, Anatomy of the angiosperm leaf, Development and differentiation, Abscission, Metamorphoses.
5. **Root:** External morphology, Anatomy of root tip, Primary growth, Root formation, Vascular tissue between root and stem, Metamorphoses, Myccorrhiza and rhizobia.
6. **Flower:** External morphology, Flower anatomy of the angiosperm, Flower anatomy of the gymnosperm, Fertilization on the angiosperm, Fertilization on the gymnosperm.
7. **Fruit:** Simple fruits, Compound fruits, Clusters.
8. **Seed:** External morphology, Angiosperm seed anatomy, Gymnosperm seed anatomy, Embryogenesis, Endosperm

**Β. LABORATORY EXERCISES**1. **The plant cell:** microscopic observation of cellular organelles.
2. **Tissues:** microscopic observation of different tissue types.
3. **Stem:** microscopic observation of sections of angiosperm stems (monocotyledons, dicots) of primary growth plants.
4. **Stem:** microscopic observation of sections of gymnosperm and angiosperm stems (dicots) with secondary growth.
5. **Leaf:** microscopic observation of angiosperm leaves sections (monocotyledons, dicots) and gymnosperm plants.
6. **Root:** microscopic observation of angiosperm root sections (monocotyledons, dicots) and gymnosperm plants.
7. **Flower:** microscopic observation of angiosperm flowers (monocotyledons, dicots) and gymnosperm plants.

**Seed:** microscopic observation of seed sections. |

1. **TEACHING and LEARNING METHODS - EVALUATION**

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| **DELIVERY***Face-to-face, Distance learning, etc.* | In class and laboratory, face to face. |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY** *Use of ICT in teaching, laboratory education, communication with students* | * Use of PowerPoint presentations in lectures
* Support of teaching/learning process through the electronic platform e-class
* Communication with students through e-mail and through the platform e-class
* Virtual Laboratory

(http://bat.uoi.gr/v\_labs/botanics/) |
| **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* |

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| ***Activity*** | ***Semester workload*** |
| Lectures | 39 |
| Laboratory exercises | 24 |
| Laboratory report | 8 |
| Self-study | 70 |
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| Course total  | ***141*** |

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| **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.* | * Written examination of theory (70%) that includes multiple choice questions and full questions.
* Laboratory reports for each laboratory exercise (30%).
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1. **ATTACHED BIBLIOGRAPHY**

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| *- Suggested bibliography:** Βοτανική (2η έκδοση), Μποζαμπαλίδης Αρτέμιος, Εκδόσεις University Studio Press Α.Ε.
* Μορφολογία και Ανατομία Φυτών (2η έκδοση), Τσέκος Ιωάννης, Ηλίας Ηλίας, ΕΚΔΟΣΕΙΣ ΚΥΡΙΑΚΙΔΗ ΙΚΕ
* Βοτανική (Δομή, Λειτουργική Δράση και Βιολογία Φυτών) (2η έκδοση), Τσέκος Ιωάννης, Ηλίας Ηλίας, ΕΚΔΟΣΕΙΣ ΚΥΡΙΑΚΙΔΗ ΙΚΕ

*- Related academic journals:** Flora
* Trees-Structure and function
* Environmental and Experimental Botany
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