COURSE OUTLINE

1. GENERAL INFORMATION

FACULTY/SCHOOL	APPLIED ECONOMICS AND SOCIAL SCIENCES / ENVIRONMENT AND AGRICULTURAL ENGINEERING		
DEPARTMENT	AGRICULTURAL ECONOMICS AND DEVELOPMENT / NATURAL RESOURCES DEVELOPMENT AND AGRICULTURAL ENGINEERING		
LEVEL OF STUDY	*Undergraduate*		
COURSE UNIT CODE	**3465**	**Semester:**	1st
COURSE TITLE	BOTANY (SYSTEMATICS-PLANT ANATOMY)		
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**
	Lectures	3	5
	Laboratory Exercises	2	
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:			
LANGUAGE OF INSTRUCTION:	Greek		
LANGUAGE OF EXAMINATION/ASSESSMENT:			
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO		
COURSE WEBSITE (URL)	https://oeclass.aua.gr/eclass/courses/COMCOUR133/		

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:

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*

This course provides knowledge necessary for most courses related to plant sciences and crop production. Describes the structure of plant cells, tissues and organs. It provides basic knowledge of proliferation and cytogenetics (mitosis and meiosis). Some operating points are listed so that students will be prepared when they listen to the lectures of the Plant Physiology course and other related courses. A connection is made between the anatomical and morphological characters of plant organisms and their evolution.

The lectures emphasize the structure of cultivated plants and therefore the material is adapted to be taught to students of Agricultural Departments. Examples of applications of the knowledge gained in Agriculture are also provided.

Regarding the subject of Systematic Botany, upon successful completion of the course, students should be able to:
• Know basic elements of the evolution and diversity of woody plants and Gymnosperms.
• Understand the main apomorphies in the evolution of flowering plants.
• Know the diversity and classification within the main groups of flowering plants (Magnoliids, Monocots, Eudicots).
• Know the morphological characteristics, main genera and important cultivated species of important families of flowering plants (e.g., Liliaceae, Amaryllidaceae, Iridaceae, Orchidaceae, Poaceae, Papaveraceae, Ranunculaceae, Crassulaceae, Vitaceae, Amaranthaceae, Caryophyllaceae, Violaceae, Fabaceae, Rosaceae, Cucurbitaceae, Betulaceae, Fagaceae, Brassicaceae, Anacardiaceae, Boraginaceae, Lamiaceae, Solanaceae, Apiaceae, Asteraceae).
• Understand the structure of the plant body and become familiar with the terminology used to describe the morphological diversity of plant organs (root, stem, leaves, inflorescences, flowers, fruits, seeds).
• Identify plant specimens using taxonomic keys.
• Know the principles of the nomenclature of plant organisms.

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.)
…….

Environmental awareness
Individual/Independent work
Group/Team work
Development of free, creative and inductive thinking
Introduction of innovative research

3. COURSE CONTENT

THEORY

1. Introduction to Botany - Evolution - Modern microscopes and the information gained from their use.
2. The structure of the plant cell (cytoplasm, biological membranes, cell wall, chloroplasts and mitochondria, nucleus, ribosomes, microsomes, endoplasmic reticulum, Golgi apparatus, cytoskeleton, vacuoles, lysosomes, cellular inclusions).
3. Growth and division of the cell.
4. Tissues: Primary and secondary growth.
5. The leaf.
6. The stem.
7. The root.
8. The reproductive organs of angiosperms.
9. Evolution and diversity of woody and seed plants
    9.1 Lignophytes – Woody plants
    9.2 Apomorphies of spermatophytes (seed evolution, pollination droplet, pollen grains, pollen tube, ovule and seed development, seed adaptations, eustele)
    9.3 Diversity of gymnosperms (Cycadophytes, Gingophytes, Conifers, Gnetales)
10. Evolution of flowering plants
    10.1 Angiosperm apomorphies (flower, stamens, reduced male gametophyte, carpel, two integuments, reduced female gametophyte, endosperm formation, sieve tube members, vessels)
    10.2 The origin of angiosperms
11. Diversity and classification of flowering plants: Amborellales, Nymphaeales, Austrobaileyales, Magnoliids, Ceratophyllales and Monocots

12. Diversity and classification of flowering plants: Eudicots (Ranunculales, Proteales, Saxifragales, Vitales, Caryophyllales, Rosids, Fabids, Malvids, Lamiids, Campanulids)
13. Plant identification
Methods of plant identification
14. Plant nomenclature
    14.1 Principles of plant nomenclature
    14.2 Botanical names

LABORATORY

Exercise 1 - The plant body.
Exercise 2 - The optical microscope and the plant cell.
Exercise 3 - Primary anatomy of the root and shoot.
Exercise 4 - Structure and function of the leaf.
Exercise 5 - Morphological diversity of plant organs (leaves, inflorescences, flowers, fruits)
Exercise 6 - Identification of plant specimens (Class Asparagales)
Exercise 7 - Identification of plant samples (Class Brassicales)
Exercise 8 - Identification of plant specimens (Class Lamiales)
Exercise 9 - Identification of plant specimens (Class Solanales)
Exercise 10 - Identification of plant specimens (Class Asterales)

4. TEACHING METHODS--ASSESSMENT

MODES OF DELIVERY *Face-to-face, in-class lecturing, distance teaching and distance learning etc.*	In-class lecturing
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY *Use of ICT in teaching, Laboratory Education, Communication with students*	Use of slide presentation and blackboard. Communication with students. Learning process support by access to e-class asynchronous distance learning platform.
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.*	

Activity/ Method	Semester workload
Lectures	39
Laboratory practice	20
Individual laboratory project (data processing and commenting)	10
Personal study	56
Total of Course (25 hours of workload per ECTS)	***125***

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,*	**I. Final written exam in the theory of the course** including a combination of 10 short-answer questions and open-ended questions. **II. The written examination in the laboratory part of the course** includes 5 short or open-ended questions, including questions for the identification of tissues and cell types of plant organs in drawings.

other……etc. *Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students.*	

5. SUGGESTED BIBLIOGRAPHY:

Michael G. Simpson. Plant Systematics. 2017. Utopia (in Greek).
Mauseth James D. Βοτανική. 2020. Broken Hill Publishers.

6. TEACHERS:

-Theory:
Georgios Liakopoulos, Associate Professor
Panagiotis Trigas, Associate Professor
Eleftheria-Perdiko Bareka, Assistant Professor
Panagiota Bresta, Assistant Professor
Aimilia-Eleni Nikolopoulou, Laboratory Teaching Stuff

-Laboratory:
Georgios Karabourniotis, Professor
Panagiotis Trigas, Associate Professor
Georgios Liakopoulos, Associate Professor
Dimosthenis Nikolopoulos, Assistant Professor
Eleftheria-Perdiko Bareka, Assistant Professor
Panagiota Bresta, Assistant Professor
Aimilia-Eleni Nikolopoulou, Laboratory Teaching Stuff
Eleni Papazoglou, Laboratory Teaching Stuff
Panagiotis Georgiou, Laboratory Teaching Stuff