

## COURSE OUTLINE

### 1. GENERAL INFORMATION

<b>FACULTY/SCHOOL</b>	SCHOOL OF ANIMAL BIOSCIENCES		
<b>DEPARTMENT</b>	ANIMAL SCIENCE		
<b>LEVEL OF STUDY</b>	<i>Pregraduate</i>		
<b>COURSE UNIT CODE</b>	3685	<b>Semester:</b>	2 <sup>nd</sup>
<b>COURSE TITLE</b>	BOTANY		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <i>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</i>		<b>WEEKLY TEACHING HOURS</b>	<b>ECTS</b>
Lectures		3	5
Laboratory Exercises		2	
<i>Add rows if necessary. The organization of teaching and the teaching methods used are described in detail under section 4</i>			
<b>COURSE TYPE</b> <i>Background knowledge, Scientific expertise, General Knowledge, Skills Development</i>	Background knowledge Skills Development		
<b>PREREQUISITE COURSES:</b>	Chemistry, Physics		
<b>LANGUAGE OF INSTRUCTION:</b>	Greek		
<b>LANGUAGE OF EXAMINATION/ASSESSMENT:</b>			
<b>THE COURSE IS OFFERED TO ERASMUS STUDENTS</b>	NO		
<b>COURSE WEBSITE (URL)</b>	<a href="http://Openeclass AUA - Botany (aua.gr)"><u>Openeclass AUA - Botany (aua.gr)</u></a>		

### 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

#### Objective of the lesson

To provide to students of Animal Science the basic units of plant biology that will constitute the required biological background for understanding the functional agronomic parameters of plant production systems and products of animal technical interest, which are developed in the courses of Improvement and Management of Pastures and Orchards, Cultivation Fodder Plants, Farm Animal Nutrition. It will focus on model plants of interest in Animal Production (grasses, legumes) and starting from the requirements of application and practice, the functional anatomy and physiology modules of forage plants will be presented.

#### Learning outcomes (level 6)

Students will identify plants of interest in Animal Production, understand the basic morphological and anatomical features of model plants of animal technical interest and their basic physiological and developmental functions. With an emphasis on field and pasture, they will recognize the basic functional characteristics of the soil utilized by the root system, the differences of root systems, know the efficiency of uptake and use of resources (water and nutrients) and the basics of harvestable and forage biomass and yields. They will understand the importance of the effects of stressed environments, the uptake of toxic metals and substances by animals through the plants they will feed on, the close relationship between plant nutrition and farm animal nutrition, and the effects of climate change on the quality of livestock plant products of interest. They will be motivated to learn in detail the agronomic and zootechnical aspects of crop and feed production systems management so that they can effectively collaborate with their respective Plant Production Scientists in vertical technologically self-sufficient and economically viable production units, improvement projects and Development Programs.

#### 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.)*

*.....*

Building a background in basic plant biology

Understanding the biological functions of plants and the agronomic processes associated with them

Autonomous & group work in a Botany Laboratory

Identification of plants with an emphasis on plants of forage interest

Understanding the use of environmental resources by plants

Understanding the importance of the basic biological functions of plants for the survival and completion of the biological cycle of plants in the field and in the countryside and their importance for sustainable agriculture - animal husbandry

### 3. COURSE CONTENT

#### Teaching Modules

1. Morphology & Functional Anatomy of Plants (Plant organs: leaves, stems, roots, flowers, fruits, seeds, special organs. Cells and tissues: types of plant cells and tissues). Application to model plants of zootechnical interest.
2. Systematic classification of plants, Taxonomic systems, Levels of taxonomic classification, Identification of Plants with an emphasis on forage cultivated species and species of native vegetation of pastures & meadows.
3. Summary of the basic physiological and developmental functions of plants: Photosynthesis, Respiration, Metabolism, Role of water, osmosis, movement of water from soil to plant and within the plant, transpiration, Biological cycle and developmental stages, Root systems, Above-ground parts and the their recommendation with an emphasis on their suitability for grazing, regenerative capacity. Differences between model plants of zootechnical interest.
4. Plant nutrition: inorganic elements, the role of the soil and its microflora. Physiology of forage crop yields. Nutrient efficiency and quality of plant biomass for animal feed. Environmental factors leading to food shortages and toxicities, problematic soils, impact on cultivation and grazing.
5. The position of plants in the food chain. The synergy of plant nutrition with the nutrition of farm animals. Feed safety. Toxic metals, toxic substances (products of secondary metabolism) migration to the grazing area, food hazards.

#### 4. TEACHING METHODS--ASSESSMENT

<b>MODES OF DELIVERY</b> <i>Face-to-face, in-class lecturing, distance teaching and distance learning etc.</i>	In-class lecturing	
<b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY</b> <i>Use of ICT in teaching, Laboratory Education, Communication with students</i>	Use of slide presentation and blackboard. Communication with students. Learning process support by access to e-class asynchronous distance learning platform.	
<b>COURSE DESIGN</b> <i>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.</i>  <i>The study hours for each learning activity as well as the hours of self-directed study are given following the principles of the ECTS.</i>	<b>Activity/ Method</b>	<b>Semester workload</b>
	Lectures	33
	Laboratory practice	22
	Skill development	8
	Individual laboratory project (data processing and commenting)	26
	Personal study	36
	<b>Total of Course (25 hours of workload per ECTS)</b>	125

<b>STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS</b> <i>Detailed description of the evaluation procedures:</i>  <i>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.</i>  <i>Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students.</i>	Oral final exam (100%) including: Open-ended judgment & documentation questions (the ability of the students to apply the principles and mechanisms and the way the subject is approached and documented by them)
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#### 5. SUGGESTED BIBLIOGRAPHY:

Raven, Plant Biology, 8th American-1st Greek Edition 2014, Utopia Publishing.
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#### 6. TEACHERS:

<b>-Theory:</b> Dimitris Bouranis, Professor, Eleftheria-Perdiko Bareka, Assistant Professor  <b>-Laboratory:</b> Dimitris Bouranis, Professor, Styliani Chorianopoulou, Assistant Professor Emilia-Eleni Nikolopoulou, EDIP
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