COURSE OUTLINE

1. GENERAL INFORMATION

FACULTY/SCHOOL	PLANT SCIENCES		
DEPARTMENT	CROP SCIENCE		
LEVEL OF STUDY	*Pregraduate*		
COURSE UNIT CODE	**253**	**Semester:**	9th
COURSE TITLE	APPLIED PLANT PHYSIOLOGY-PLANT STRESS IDENTIFICATION		
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		5	5
Laboratory Exersices			
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*	Skills Development		
PREREQUISITE COURSES:	(3530) FUNCTIONAL PLANT ANATOMY, (55) PLANT PHYSIOLOGY, (1280) GENERAL MICROBIOLOGY, (890) GENERAL AND SYSTEMATIC ENTOMOLOGY, (665) BIOCHEMISTRY, (1855) GENERAL PHYTOPATHOLOGY, (1750) PLANT STRESS PHYSIOLOGY, (8) PHYSIOLOGY OF PLANT NUTRITION		
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/EFP184/		

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*

The course aims to synthesize all the knowledge that students have acquired in order to recognize the effects of stressors in the field. Upon successful completion of the course, students will possess knowledge regarding the steps to follow in order to identify biotic and abiotic stresses of individual plants or crops in the field or in the greenhouse.

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
Adapting to new situations
Decision-making
Individual/Independent work
Group/Team work
Development of free, creative and inductive thinking
Working in an interdisciplinary environment
Introduction of innovative research

3. COURSE CONTENT

THEORY

1. Identification of stresses in the field
2. Sequential steps to identify stresses at the crop level
a. Knowledge of the characteristics of the cultivated plant
b. Recognizing the symptoms and signs - determining the problem
c. Observation of possible particular patterns in the field
d. Review of crop history
e. Distinguish between problems caused by biotic or abiotic stressors in the field
e1. Distinguish between biotic stressors
1. Symptoms or signs of pathogen infestation
2. Symptoms or signs of insect, mite or herbivore infestation
e2. Distinguish between abiotic stressors
1. Mechanical stress
2. Extreme values of physical parameters (temperature, light intensity, oxygen concentration, water sufficiency)
3. Toxicities
3. Identification of stresses at the plant level
a. Seeds
b. Seedlings
c. Grown plants
c1. leaves
c2. shoots
c3. roots
4. Difficult cases: Different stressors causing similar symptoms

PRACTICAL EXERCISES IN THE FIELD

Field training on the sequential steps to identify stresses at the crop level. Observation of possible particular patterns in the field. Differentiation of symptoms caused by biotic or abiotic stress factors in the field. Identification of stresses at plant level and its organs based on symptoms and signs. Learning to use a key.

4. TEACHING METHODS--ASSESSMENT

MODES OF DELIVERY *Face-to-face, in-class lecturing, distance teaching and distance learning etc.*	In-class lecturing, Laboratory and field training
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	6
Individual laboratory project (data processing and commenting)	
Personal study	80
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, other……etc.* *Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students.*	**I. Final written exam in the theory and in practical exercises of the course** including 8 open-ended questions.

5. SUGGESTED BIBLIOGRAPHY:

Indentification of biotic and abiotic plant stresses. 2018. D. Tsitsigiannis, G. Economou, D. Perdikis, G. Liakopoulos, G. Aivalakis, G. Karabourniotis. Course notes available in openeclass platform.
Plant Stress Physiology. 2012. G. Karabourniotis, G. Liakopoulos, D. Nikolopoulos. EMBRYO Publications.

6. TEACHERS:

-Theory:
Georgios Karabourniotis, Professor
Garyfallia Economou-Antonaka, Professor
Dimitrios Tsitsigiannis, Professor
Dionysios Perdikis, Associate Professor
Georgios Liakopoulos, Associate Professor
-Laboratory:
Georgios Karabourniotis, Professor
Garyfallia Economou-Antonaka, Professor

Dimitrios Tsitsigiannis, Professor
Dionysios Perdikis, Associate Professor
Georgios Liakopoulos, Associate Professor