

Environmental Plant Physiology

Code: 100822
ECTS Credits: 6

Degree	Type	Year	Semester
2500251 Environmental Biology	OB	2	2

Contact

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Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Teachers

Benet Gunse Forcadell
Alfredo Encuentra Martínez

Prerequisites

None

Objectives and Contextualisation

The Environmental Plant Physiology is the second subject of a set of 3 that form the subject of Plant Physiology. It is compulsory and is taken in the second semester of the second year after having completed the compulsory subject of Plant Physiology.

The training objective of this subject is centered in the acquisition of competences within the framework of the theoretical and practical training of the student.

The Environmental Plant Physiology has the training objectives of acquiring knowledge at the organizational level of the organisms and their physiology in front of internal and external factors. Another aim is to identify the mechanisms of adaptation to the environment.

Competences

- Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.
- Carry out functional tests and determine, assess and interpret vital parameters.
- Communicate efficiently, orally and in writing.
- Introduce changes in the methods and processes of the field of knowledge to provide innovative responses to the needs and demands of society.
- Reason critically.
- Take account of social, economic and environmental impacts when operating within one's own area of knowledge.

- Take sex- or gender-based inequalities into consideration when operating within one's own area of knowledge.
- Understand the bases of regulation of vital functions of organisms through internal and external factors, and identify environmental adaptation mechanisms.
- Work individually and in teams.

Learning Outcomes

1. Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.
2. Actuar en l'àmbit de coneixement propi avaluant les desigualtats per raó de sexe/gènere.
3. Apply tests and indexes to assess the functioning and development of plants.
4. Communicate efficiently, orally and in writing.
5. Interpret plants' mechanisms of physiological adaptation to environmental stress.
6. Introduce changes in the methods and processes of the field of knowledge to provide innovative responses to the needs and demands of society.
7. Reason critically.
8. Take account of social, economic and environmental impacts when operating within one's own area of knowledge.
9. Work individually and in teams.

Content

Theory:

Concepts of stress and resistance

Perception and transduction of stimuli

Rhizospheric processes

Physiological responses to deficit and excess of water

Saline and ionic stress. Physiology of halophilic and metallophilic plants

Adaptations to calcareous soils and acid soils

Physiological responses to the thermal and light environment

Physiological responses to the mechanical and chemical effects of the atmosphere

Practical applications of the knowledge of Environmental Plant Physiology

Lab practices:

Influence of light on plant growth

Effect of wind on the degree of stomatal opening

Influence of physical and chemical factors on the permeability of cell membranes

Influence of suboptimal phosphorus levels on acid phosphatase activity

Methodology

The teaching methodology combines magisterial classes of 50 minutes with ICT support (available virtual campus) and debate in a group of seminars. As well as tutorials, personal study, and laboratory practices where individual and team work is combined.

Seminars promote the capacity for analysis and synthesis, critical reasoning through activities such as written and oral presentation in public of works, assessment and critical discussion, commentary of videos, resolution of questions related to the treated subjects, etc. In the seminars the student can work individually or in small groups.

Laboratory practices are understood as an autonomous process based on guided observation and support material during practices. Students will also have to produce the results obtained, performing the relevant calculations with the teacher's support and, where appropriate, respond to the questions raised in the scripts / memoirs.

The personalized or group tutorials will be used to clarify concepts, establish knowledge acquired and facilitate the study to the student. They will also be used to resolve doubts about the work presented in the seminars.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Laboratory practices	12	0.48	1, 2, 8, 3, 5, 7, 9
Magistral lectures	34	1.36	5, 6, 7
Seminars	6	0.24	4, 7, 9
Type: Supervised			
Tutorials	6	0.24	5, 7
Type: Autonomous			
Lecture of papers	30	1.2	7, 9
Reports	18	0.72	3, 4, 5, 7, 9
Study	34	1.36	5, 7, 9

Assessment

The specific and transversal competences of this subject will be evaluated by means of written tests (exams), thematic works delivered in written form, questionnaires filled out, oral presentations; Participation in seminars and tutorials.

- The written tests are eliminatory. The mark will be done with the half between the two partials, a minimum grade of 4 is required. If you want to raise a note, you must complete the final test and in no case will the partial note be saved.

- Laboratory practices: Attendance is compulsory. The weight of the practices in the final grade of the subject is 15%. A final individual written test will be done on the last day of the practical course and it will account for 80% of the practice mark. The practice notebook will be carried out in groups and will account the remaining 20% of the mark. The notebook will be delivered via Virtual Campus one week after the end of the practical course.

To be able to attend it, it is necessary for the student to justify having passed the biosafety and security tests that he will find on the Virtual Campus and be knowledgeable and accept the rules for the deaths of the laboratories of the Faculty of Biosciences.

- Seminars: The quality of the preparation and presentation of public works or exhibitions will be assessed as well as the answers to the questions proposed. Overall, the evaluation of the seminars has a global weight of 15% of the final grade.

To pass the subject, a final minimum qualification of 5.0 must be obtained in the written test, in practice and in the seminars.

To participate in the recovery (1st part, 2nd part or final test), the students must have been previously evaluated in a set of activities whose weight equals to a minimum of two thirds of the total grade of the subject or module. Therefore, students will obtain the "Non-Valuable" qualification when the evaluation activities carried out have a weighting of less than 67% in the final grade

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
1st written test	35%	4.5	0.18	3, 4, 5, 6, 7
2nd written test	35%	4.5	0.18	3, 4, 5, 6, 7
Laboratory practices	15%	0	0	1, 2, 8, 3, 4, 7, 9
Seminars	15%	1	0.04	4, 5, 7, 9

Bibliography

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LAMBERS, H., CHAPIN III, F.S., PONS, T.L.: Plant Physiological Ecology. 2nd Edition. Springer, 2008

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TAIZ, L. & ZEIGER, E.: Fisiología Vegetal. Publicacions Universitat Jaume I, Castelló de la Plana, 2006

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Software

PowerPoint