

**Environmental Plant Physiology**

Code: 100799  
ECTS Credits: 6

Degree	Type	Year	Semester
2500250 Biology	OT	4	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**

Isabel Corrales Pinart

**Prerequisites**

None

**Objectives and Contextualisation**

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.
- Apply statistical and computer resources to the interpretation of data.
- Be able to analyse and synthesise
- Be able to organise and plan.
- Carry out functional tests and determine, assess and interpret vital parameters.
- Make changes to methods and processes in the area of knowledge in order to provide innovative responses to society's needs and demands.
- Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
- Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
- Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
- Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.

- Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
- 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.

## Learning Outcomes

1. Analyse a situation and identify its points for improvement.
2. Apply statistical and computer resources to the interpretation of data.
3. Be able to analyse and synthesise.
4. Be able to organise and plan.
5. Carry out functional tests and determine, assess and interpret vital parameters in plants.
6. Critically analyse the principles, values and procedures that govern the exercise of the profession.
7. Propose new methods or well-founded alternative solutions.
8. Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
9. Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
10. Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
11. Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.
12. Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
13. Take account of social, economic and environmental impacts when operating within one's own area of knowledge.
14. Take sex- or gender-based inequalities into consideration when operating within one's own area of knowledge.

## 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

Roots ability to modify the pH of the medium

Observation of aluminum penetration into roots by staining with hematoxylin

## Methodology

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

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 / reports, reasoning their results. In these practices the student will work in small groups and will append to distribute the work.

The personalized or group tutorials will be used to clarify concepts, establish knowledge acquired and facilitate the study to the student.

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	20	0.8	14, 13, 6, 1, 2, 5, 7, 4
Magistral lectures	30	1.2	3, 4
Type: Supervised			
Tutorials	4	0.16	3, 4
Type: Autonomous			
Lecture of papers	30	1.2	3, 4
Reports	18	0.72	3, 4
Study	36	1.44	3, 4

## Assessment

The specific and transversal competences of this subject will be assessed by means of written tests (exams), memory of practices, questionnaires, and tutorials.

Written tests are eliminatory. The mark will be done with the half between the two partials, a minimum grade of 4,5 is required and to pass the subject a minimum final grade of 5.0 must be obtained in the written test and practices.

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 mandatory. The weight of the practices in the final grade of the subject is 25%. 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 participate in the recovery, students must have been previously assessed in a set of activities whose weight is equivalent to a minimum of two thirds of the total grade of the subject or module. Therefore, students will obtain the grade of "Non-Assessable" when the assessment activities performed have a weighting of less than 67% in the final grade.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
1st written test	37.5 %	4.5	0.18	13, 6, 12, 11, 10, 8, 3, 4
2nd written test	37.5 %	4.5	0.18	12, 11, 10, 8, 3, 4
Laboratory practices	25 %	3	0.12	14, 1, 2, 5, 7, 8, 9, 4

## Bibliography

REIGOSA, M., PEDROL, N. & SÁNCHEZ, A.: La ecofisiología vegetal, una ciencia de síntesis. Paraninfo, 2004

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

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

BARCELÓ, J., NICOLÁS, G., SABATER, B. & SÁNCHEZ, R.: Fisiología Vegetal. Editorial Pirámide, Madrid, 2003

LÓPEZ-SÁEZ, JA., CATALÁN, P. & SÁEZ, LI: Plantas parásitas de la Península Ibérica e Islas Baleares. Ediciones Mundi-Prensa, 2002

## Software

None