

Plant Physiology

Code: 100912
ECTS Credits: 3

2024/2025

Degree	Type	Year
2500252 Biochemistry	OB	2

Contact

Name: Soledad Martos Arias

Email: soledad.martos@uab.cat

Teachers

Eliana Carolina Bianucci Ovando

Teaching groups languages

You can view this information at the [end](#) of this document.

Prerequisites

It is recommended to do simultaneously this subject and Laboratoris Integrats II

Objectives and Contextualisation

The objectives of this subject of Plant Physiology are:

1. To show how important are the plants for the correct functioning of the planet and the human beings.
2. To introduce the basic vital functions of plants.
3. To introduce the basic vital functions of plants.
4. To know the regulation of plant development by internal and external factors.

Competences

- Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.
- Describe intercellular and intracellular communication systems that regulate the proliferation, differentiation, development and function of animal and plant tissues and organs.
- Describe metabolic routes, their interconnections and their physiological significance, and also understand the mechanisms that regulate their activity to satisfy physiological needs.
- Describe the structural, physiological and biochemical characteristics of the different types of cells and explain how their properties fit in with their biological function.

- Introduce changes in the methods and processes of the field of knowledge to provide innovative responses to the needs and demands of society.
- 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. Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.
2. Describe the metabolic pathways of plants and the functions of their products.
3. Describe the molecular bases of development in plants.
4. Integrate knowledge of the structure, biochemistry and functions of cells within whole-plant physiology.
5. Introduce changes in the methods and processes of the field of knowledge to provide innovative responses to the needs and demands of society.
6. Take account of social, economic and environmental impacts when operating within one's own area of knowledge.
7. Take sex- or gender-based inequalities into consideration when operating within one's own area of knowledge.

Content

Theory

Block I: Introduction

Topic 1: Introduction to Plant Physiology

Topic 2: The cell wall in plants

Block II: Nutrition and transport

Topic 3: Water in the plant

- Water needs: concept of water potential, osmotic relationships and growth
- Water in the soil and its absorption by the plant

Topic 4: Mineral nutrition

- Mineral needs and nutrient absorption
- Long-distance transport of nutrients

Block III: Photosynthesis and metabolism

Topic 5: Light and the use of light energy

Topic 6: Reductive assimilation of Carbon: Metabolism C₃, C₄ and CAM

Topic 7: Reductive assimilation of Nitrogen and Sulfur

Block IV: Physiology and regulation of plant development

Topic 8: Regulation of growth and development by internal and external factors

Topic 9: Dormition and germination.

Topic 10: Formation and maturation of fruits

Topic 11: Aging and senescence

Seminars

Specific tasks for each seminar related to plant physiology that will be developed by groups

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Reading texts	15	0.6	1, 7, 6, 3, 2, 4, 5
Seminars	6	0.24	1, 7, 6, 3, 2, 4, 5
Study	26	1.04	6, 3, 2, 4, 5
Theoretical classes	16	0.64	6, 3, 2, 4, 5
Tutorials	1	0.04	3, 2, 4
Writing of works	7	0.28	3, 2, 4

The methodological approach employed to facilitate the learning process is based on engaging the student with the information at their disposal. The educator's responsibility is not only to provide the necessary information but also to direct the students towards resources where they can acquire it. The educator serves as a guide and mentor, ensuring that the learning process is executed effectively. To realize this objective, the course incorporates a mix of various activities. These include master classes, seminars, independent study, and collaborative work, both at an individual and team level. This diverse mix of activities is designed to foster a comprehensive and effective learning environment.

Master classes

Through these classes, students gain fundamental scientific and technical knowledge of the subject, which they are expected to supplement with personal study of the topics discussed. The theoretical sessions underscore and address the complex and crucial aspects of each instructional unit. Following this, students can enhance their constructed concept maps with bibliographic information derived from their individual work. Each theoretical session is designed to span a duration of 50 minutes.

Seminars

The mission of the seminars is to promote the capacity for analysis and synthesis, critical reasoning and the ability to solve problems. Various activities can be developed in the seminars, such as, for example, analysis and discussion of cases and problems, public presentation of works, commentary of videos, resolution of issues related to the topics covered, etc.

Tutorials

Tutorials will be conducted in a personalized way, either in person or through virtual sessions, which will be scheduled in advance. These tutorials serve as a platform to elucidate concepts, consolidate the knowledge gained, and aid students in their studies. Additionally, they provide an opportunity to address any uncertainties students may have regarding the preparation of their independent learning tasks.

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.

Assessment

Continuous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
first partial	40%	1.5	0.06	6, 3, 2, 4, 5
second partial	40%	1.5	0.06	6, 3, 2, 4, 5
seminars	20%	1	0.04	1, 7, 6, 3, 2, 4, 5

The specific and transversal competences of this subject will be evaluated by means of written tests (exams) and the tasks proposed for the seminars.

The written tests can be passed with the eliminatory partial exams or with the recovery test. In case of not having attended a partial exam or having attended but not having obtained a minimum grade of 5 (out of 10), this can be recovered in the final exam.

Seminars: The correctness of the argumentation on the proposed questions and problems will be evaluated. Overall, the evaluation of the seminars has a global weight of 20% of the final grade. Seminars are mandatory attendance activities and are not recoverable.

To pass the subject, a minimum grade of 5.0 must be obtained. This grade is the result of the sum of the following items: 80% theory note, 20% seminar grade. It is necessary to get a minimum of 5.0 in theory in order to average with the seminars.

The awarding of Honors will be applied from a grade equal to or greater than 9.0. The number of Honors will depend on the number of enrollees.

Students who wish to improve their final grade can do so by taking the final exam. In this case, it is understood that the student renounces their previous qualifications and their final grade is calculated based on the new grade of the final exam. It is not possible to improve the grade through assignments or other types of activities.

A student will be considered as 'NOT EVALUABLE' if the evaluation activities carried out account for less than 67% of the final grade. Therefore, all those students who have not submitted any written work and/or seminar and have not taken any of the planned evaluation tests will be classified as not evaluable. It is understood, therefore, that if the student takes at least one of the exams or submits at least two of the seminars contemplated in the ordinary evaluation but does not take the rest of the exams or submissions, they will be considered as 'NOT PRESENTED'.

Special situations

If for justified reasons (illness, death of a first-degree relative or accident, etc.) and providing the corresponding official documentation, the right to take the test on another date will be granted. This date will be agreed upon between the affected student and the teaching staff. The degree coordination would intervene in case an

agreement is not reached. Similarly, if for the same justified reasons, the student could not take the evaluation tests at the assigned times, they could take them at special times to be agreed upon with the teaching staff.

Single evaluation

Students who opt for the single evaluation will not be required to attend the seminars, but they will have to complete 3 out of the 6 seminars that make up the subject in a continuous evaluation format. The teaching staff will choose the seminars that the students in the single evaluation option have to do. The delivery of the seminar tasks will be made on the same day as the one set for the synthesis test.

The single evaluation consists of a unique synthesis test (with questions to develop and relate concepts) on the contents of the entire theory program. The grade obtained in the synthesis test is 80% of the final grade of the subject, and the seminars make up the remaining 20%.

The single evaluation test will be carried out coinciding with the same date set for the last continuous evaluation test and the same recovery system will be applied as for the continuous evaluation.

To pass the subject, it is necessary to obtain a minimum final grade of 5 points out of 10 in each of the parts (synthesis test and seminars).

Bibliography

Basic bibliography

- ***Fisiología Vegetal***. Barceló, J., Nicolás, G., Sabater, B., Sánchez, R. 2009 (2ª ed).
- ***Fundamentos de Fisiología Vegetal***. Azcón-Bieto, J., Talón, M. 2008 (2ª ed).
- ***Plant Physiology and Development***. Taiz, L., Zeiger, E., Murphy, A., Moller I. M. 2015 (6ª ed).
https://learninglink.oup.com/access/taiz-plant-physiology-6e-student-resources#all_resources
- ***Plant Physiology***. Campbell, A. M., Paradise, C. J. 2016.
- ***Biología de las plantas. Tomo II***. Peter H. Raven, , Ray F. Evert, , and Susan E. Eichhorn. 2015.
https://bibcercador.uab.cat/permalink/34CSUC_UAB/avjcib/alma991010517479506709

Extra bibliography

- ***Plant Physiology and Function***. Clemens, S. 2020. Springer.
- ***Herbicides and Plant Physiology*** 2e. Cobb, A. H., Reade, J. P. H. 2010. John Wiley & Sons Incorporated.
- ***Plant Physiology, Development and Metabolism***. Bhatla, S. C., Lal, M. A. 2018. Springer Singapore.
- ***Molecular Stress Physiology of Plants***. Rout, G. R., Das, A. B. 2013. Springer India.

Software

None

Language list

Name	Group	Language	Semester	Turn
(SEM) Seminars	321	Catalan/Spanish	first semester	afternoon
(SEM) Seminars	322	Catalan/Spanish	first semester	afternoon
(TE) Theory	32	Spanish	first semester	afternoon