

Plant Physiology

Code: 100912
ECTS Credits: 3

Degree	Type	Year	Semester
2500252 Biochemistry	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: No
Some groups entirely in Spanish: No

Other comments on languages

Lectures will be done in Spanish. Seminars and the usual language will be Catalan.

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 introduce the basic vital functions of plants.
2. To introduce the basic vital functions of plants.
3. To know the regulation 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

Topics

1. Introduction to Plant Physiology
2. The plant cell, plasma membranes and cell wall
3. Water needs: concept of water potential, osmotic relationships and growth
4. Water absorption and transport
5. Mineral needs: mineral nutrition of the plant
6. Nutrient absorption and transport
7. Plants and light: photosynthetic pigments; energy transformation
8. Carbon-reducing assimilation: C3 metabolism
9. Reducing Carbon Assimilation: C4 and CAM Metabolism
10. Reductive assimilation of Nitrogen and Sulphur
11. Regulation of growth and development by internal factors: phytohormones and genetic regulation
12. Regulation by external factors: Flowering sensor and regulation systems
13. Dormition. Seed germination
14. Fruit formation and ripening
15. Aging and senescence: organ abscission

Methodology

The methodology used to achieve the learning process is based on making the student work on the information available to him. The teacher's role is to give her the information or indicate where she can get it, guiding and tutoring her so that the learning process can be carried out effectively. To achieve this goal, the course is based on the following activities, through the combination of: master classes, seminars, personal study and individual and team work.

Master classes

With these classes the student acquires the basic scientific-technical knowledge of the subject that must complement with the personal study of the explained subjects. The theoretical sessions highlight and address the complicated and important points of each teaching unit. Subsequently, the student from the concept map made will be able to complement it with bibliographic information from his non-contact work. The theoretical sessions will take 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

The tutorials will be carried out in a personalized way in the teacher's office or by Teams (previously scheduled). Tutorials should be used to clarify concepts, establish the knowledge acquired and facilitate study by students. They can also be used to resolve doubts that students have about the preparation of self-learning work.

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			
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

Assessment

The specific and transversal competences of this subject will be evaluated by means of written tests (exams), oral presentations and participation in the seminars.

Written tests can be overcome with partial eliminatory exams or with the recovery test. Students who have not been presented for a partial exam or have submitted a pass have not approved it (minimum grade 5 up to 10) can recover it to the recovery test.

In accordance with the regulations: "In order to participate in the recovery, the students must have been previously evaluated in a set of activities whose weight equals to a minimum of two thirds of the total qualification of the student, subject or module. Therefore, students will obtain the "Non-Appraising" qualification when the assessment activities carried out have a weighting of less than 67% in the final grade".

It is necessary to get a minimum of 5.0 in the theory part to be able to average with the seminars.

Seminars: The quality of the preparation and presentation of public works or exhibitions will be assessed as well as the answers to the questions and problems proposed. Overall, the evaluation of the seminars has a global weight of 20% of the final grade. Seminars attendance is mandatory. This activity will not be recoverable.

To pass the subject, a minimum grade of 5.0 must be obtained. This note is the result of the sum of the following items: 80% theory note, 20% note seminars.

The obtaining of the Highest mark (**matrícula d'honor**) will be applied from a note equal to or greater than 9.0. The number of MH will depend on the number of enrollments of the current course.

Improvement of note

Students who want to improve their final grade can do so by presenting themselves to the final exam. In this case, it is understood that the student waives the previous qualifications and his/her final grade is calculated from the new final exam's grade. It is not possible to improve the note through work or other types of activities.

Definition of non-evaluable

It will be considered that a student will obtain the qualification of NOT AVALUABLE if the following assumption is given:

The weight of all conducted evaluation activities is less than 67% of the final score

It will be described as non-evaluable to all those students who have not submitted a written and / or a seminar in writing and have not carried out any of the assessment tests planned. It is understood, therefore, that if the student does at least one of the exams or presents at least one of the works contemplated in the ordinary assessment, he will have to carry out the complete evaluation of the subject.

Special cases

If for justified reasons (illness, death of a first-degree relative or accident, etc.) and provide the official documentation corresponding to the Degree Coordinator, they will be entitled to take the test in question on another date. The Degree Coordinator will ensure the specification of this with the teacher of the subject affected. However, if for the same justified reasons, the student could not perform the evaluation tests in the assigned hours, they can do them in special schedules to agree with the teaching staff.

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

Bibliography

- Azcón-Bieto, J. i Talón M., 2008. Fundamentos de Fisiología Vegetal. Segunda edición. The McGraw-Hill Companies.

Digital link to download the book:

<http://web.b.ebscohost.com/pfi/results?sid=38c2bb9d-86f2-4532-b9fe-33e16ba2119d%40pdc-v-sessmgr01>

- Barceló, J. et al., 2005. Fisiología Vegetal. Pirámide, Madrid.
- Taiz, L. i Zeiger, E., 2010. Plant Physiology. 5th Edition. Sinauer, Sunderland.

<http://6e.plantphys.net/>

Infografy from the Library Facility to find electronic sources: <https://ddd.uab.cat/record/22492>

Software

None