

Plant Physiology

Code: 100912
ECTS Credits: 3

Degree	Type	Year	Semester
2500252 Biochemistry	OB	2	2

Contact

Name: Josep Allué Creus
Email: Josep.Allue@uab.cat

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

Prerequisites

No prerequisites

Objectives and Contextualisation

- Describe the functional mechanisms of plants and their regulation through external and internal factors
- Integrate the functional processes of the plants from the different organizational levels within the plant organism
- Identify the crucial discoveries in the history of Plant Physiology and assess its significance for subsequent scientific development of the discipline

Competences

- 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.

Learning Outcomes

1. Describe the metabolic pathways of plants and the functions of their products.
2. Describe the molecular bases of development in plants.
3. Integrate knowledge of the structure, biochemistry and functions of cells within whole-plant physiology.

Content

1st part

- Concept of Plant Physiology

- Characteristics of the plant cell. Compartmentation
- Cellular wall
- Water relations. Absorption and transport of water and nutrients
- Chloroplasts. Light and photosynthetic pigments
- Photosynthesis. Luminaire reactions Photosynthetic electronic transport and photophosphorylation
- Reduction assimilating CO₂. C₄ and CAM plants. Photorespiration

2nd part

- Primary and intermediate metabolism: glucans and lipids. Plant respiration
- Reduction assimilating nitrogen and sulphur
- Secondary metabolism
- Growth of plants and their regulation. Fotomorphogenesis.
- Fitohormones: auxins, cytoquinins, gibberellins, abscisic acid, ethylene
- Flowering: photoperiodism, thermodynamics and vernalization
- Germination
- Senescence of plants. Models and mechanisms

Methodology

Types	Activity	Hours	Learning outcomes
Directed	Theoretical classes	16	Interpret the interaction between the biochemical and physiological levels that determine the functioning of plants. Interpret the physiological processes that regulate the growth and reproduction of vegetables
Directed	Seminars	6	The ability to analyze and synthesize, critical reasoning through activities, such as written and oral presentation in public of works, assessment and critical discussion, comment of videos, resolution of issues related to the topics discussed is promoted, etc. In seminars the student can work individually or in small groups.
Supervised	Tutorials	1	They will serve to clarify concepts, consolidate acquired knowledge and facilitate student study. They will also take advantage to solve doubts about the work proposed in the seminars.
Autonomous	Study	26	CE3, CE9, CE11, CT4

Autonomous	Drafting works	7	CE3, CE9, CE11, CT4, CT2, CT9
Autonomous	Reading texts	15	CE3, CE9, CE11, CT4, CT2

Activities

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

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 5/10) 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".

The minimum score to participate in the recovery is 3.5.

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.

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.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
first partial	30%	1	0.04	2, 1, 3
second partial	50%	2	0.08	2, 1, 3

Bibliography

BARCELÓ, J.; NICOLÁS, G.; SABATER, B.; SÁNCHEZ, R.: *Fisiología Vegetal*. Pirámide. Madrid (2007).

MOHR, H.; SCHOPFER, P.: *Plant Physiology*. Springer Verlag, Berlin (1995).

SALISBURY, F.B.; ROS, C. W.: *Plant Physiology*, 4th edition. Wadsworth Publ. Company, Belmont, California (1992).

SCHOPFER, P.; BRENNICKE, A.: *Pflanzenphysiologie*, Elsevier, Spektrum (2006).

TAIZ, L.; ZEIGER, E.: *Plant Physiology*, 4ª Ed. Sinauer Associates, Sunderland (2006)

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