

Plant Physiology and Metabolism

Code: 44780
ECTS Credits: 6

2025/2026

| Degree | Type | Year |
|---|------|------|
| Plant Biology, Genomics and Biotechnology | OP | 1 |

Contact

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Teachers

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Teaching groups languages

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

Prerequisites

Basic knowledge of Plant Physiology and Plant Metabolism

Objectives and Contextualisation

Acquisition of an integrative vision at the molecular, metabolic and physiological level of plant functioning based on the metabolic diversity of plants and their regulation through various internal and external factors.

Learning Outcomes

1. CA01 (Competence) Apply biotechnological cell factory methods to plants and fungi to obtain new secondary metabolite products that are useful in the pharmaceutical and food industries.
2. CA02 (Competence) Work in a multidisciplinary team while respecting the universal accessibility of all people in the field of plant physiology and metabolism.
3. KA01 (Knowledge) Describe transport processes and characterise the regulation of plant metabolism.
4. KA02 (Knowledge) Identify and evaluate sex/gender inequalities in the field of plant biology.

5. SA01 (Skill) Manage bibliographic information and computer resources in the field of plant physiology and metabolism.
6. SA02 (Skill) Apply knowledge of secondary metabolites of plants for industrial and biotechnological uses.
7. SA03 (Skill) Select and apply plant models to the study of functional mechanisms in plants.
8. SA04 (Skill) Apply the most appropriate experimental tools to the study of plant phenotyping.

Content

Compartmentation of the plant cell

Energy transformation

Transport processes and their regulation in plants

Primary and Secondary metabolism

Experimental techniques in Plant Physiology and Metabolism:

- Growth analysis and phenotyping
- Membrane stability (stress marker)
- Water and ionic relations
- Fluorescence of chlorophylls

Activities and Methodology

| Title | Hours | ECTS | Learning Outcomes |
|---|-------|------|-------------------|
| <hr/> | | | |
| Type: Directed | | | |
| Laboratory practices | 9.5 | 0.38 | |
| Seminars | 10 | 0.4 | |
| Theoretical classes | 18 | 0.72 | |
| <hr/> | | | |
| Type: Supervised | | | |
| Preparation of seminars and reports | 24 | 0.96 | |
| <hr/> | | | |
| Type: Autonomous | | | |
| Personal study, consultation and analysis of articles and reports | 87.5 | 3.5 | |
| <hr/> | | | |

In-person, supervised activities and visit to an external institution

The in-person activities are theory classes, seminars, laboratory practices and a visit to a research institution.

The supervised activities refer to the preparation of presentations at the seminar. Students can request personalized tutoring sessions from teachers

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

Continous Assessment Activities

| Title | Weighting | Hours | ECTS | Learning Outcomes |
|--|-----------|-------|------|------------------------------|
| Attendance and participation in classes and seminars | 10% | 0 | 0 | CA02, SA04 |
| Individual presentation at the seminar | 30% | 0 | 0 | CA01, KA01, SA01, SA02, SA03 |
| Report of laboratory activities | 20% | 0 | 0 | CA01, CA02, SA01, SA02, SA04 |
| Written exam on the content of the theoretical classes | 40% | 1 | 0.04 | KA01, KA02, SA02 |

The final grade is calculated as follows:

attendance and participation in classes and seminars (10%);

laboratory activities report (20%),

individual presentation at the seminar (30%),

written exam on the content of theoretical classes (40%)

The use of Artificial Intelligence (AI) technologies is not allowed in any phase of this course. Any work that includes AI-generated content will be considered a breach of academic integrity and may result in partial or total penalties in the activity grade, or more serious sanctions in severe cases.

This subject/module does not include the single assessment system.

Bibliography

Barceló J, Nicolás G, Sabater B, Sánchez R (2001) Fisiología Vegetal. Pirámide, Madrid

Barceló J (2010) Perspectivas y retos de estudio en Fisiología vegetal, Boletín de la Sociedad Española de Fisiología vegetal 51: 35-44

Taiz L, Zeiger E, Moller IM, Murphy A (2014) Plant Physiology and Development, 6th edition. Sinauer Assoc. Oxford Univ Press. <http://6e.plantphys.net/>

Buchanan BB, Griessen W, Jones RL (2015) Biochemistry & Molecular Biology of Plants. 2nd edition; Wiley, Blackwell, Chichester, U.K.

Jones R, Ougham H, Thomas H, Waaland S (2013) The Molecular Life of Plants, Wiley-Blackwell, Chichester, U.K.

Grierson CS et al (2011) One-hundred Questions Facing Plant Science Research. New Phytologist 192: 6-12. <http://onlinelibrary.wiley.com/doi/10.1111/j.1469-8137.2011.03859.x/full>

Software

No special software required

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject.

| Name | Group | Language | Semester | Turn |
|---|-------|----------|----------------|---------------|
| (PLABm) Practical laboratories (master) | 1 | English | first semester | morning-mixed |
| (SEMm) Seminars (master) | 1 | English | first semester | morning-mixed |
| (TEm) Theory (master) | 1 | English | first semester | morning-mixed |