

## 27114 - Plant Physiology

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 27114 - Plant Physiology

**Faculty / School:** 100 - Facultad de Ciencias

**Degree:** 446 - Degree in Biotechnology

**ECTS:** 6.0

**Year:** 2

**Semester:** Second semester

**Subject type:** Compulsory

**Module:**

### 1. General information

The general objective of the subject is the knowledge of the functioning of photosynthetic organisms, providing the student with the basic contents essential for the development of plant biotechnology.

These approaches and objectives are aligned with several Sustainable Development Goals (SDGs) of the 2030 Agenda of United Nations (<https://www.un.org/sustainabledevelopment/es/>), in such a way that the acquisition of the learning results of the subject provide training and competence to contribute in some way to their achievement. Goals:

- 1: End of poverty
- 2: Zero hunger
- 3: Health and wellness
- 5: Gender Equality.
- 9: Industry, Innovation and Infrastructure
- 11: Sustainable Cities and Communities
- 12: Responsible Production and Consumption
- 13: Climate Action
- 15: Life of Terrestrial Ecosystems.

### 2. Learning results

The student, in order to pass this subject, must demonstrate the following:

- Knowledge of the main taxonomic groups of photosynthetic organisms.
- Knowledge and understanding of the functional significance of the organelles and components of plant cells.
- Knowledge and understanding of the structure and function of the different types of plant tissues, as well as the basic organography.
- Understanding of the role of water and minerals in plants and the functioning of water absorption processes in the soil-plant-atmosphere system.
- Knowledge of the metabolism of plants, differentiating its specific aspects with respect to other groups of living beings.
- Understanding of the process of photosynthesis, both the photochemical phase and the synthesis of organic compounds, including its variants.
- Knowledge of the different types of plant hormones, their role in plant development and their mechanism of action.
- Ability to handle plant material in the laboratory.

### 3. Syllabus

Topics:

1. Introduction to the Study of Plant Physiology
2. Plant cytology, histology and organography
3. Plant anatomy
4. Movement of water and solutes in plants
5. Mineral nutrition in plants
6. Nitrogen metabolism: assimilation and biological fixation
7. Gas exchange: leaves and atmosphere
8. Photosynthesis: light phase

9. Photosynthesis: carbon fixation phase
10. Introduction to plant development
11. Regulation of growth and development: light
12. Regulation of growth and development: phytohormones
13. Physiology of flowers, seeds and fruits
14. Plant movements
15. Stress physiology in plants: biotic and abiotic stresses

#### **4. Academic activities**

The program includes the following academic activities:

- Participative master classes: 3 hours per week.
- Practical classes: students will learn how to handle plant material in the laboratory. Aspects that have been developed in the theoretical classes will be studied and observed. A total of 10 hours of practice will be given, distributed in 3 sessions of laboratory
- Seminars: their realization is compulsory. They will be planned during the term, according to the students schedule.

#### **5. Assessment system**

The ability to relate concepts and expression in the correct scientific language will be especially valued.

For the continuous assessment, different activities will be carried out in Moodle (quizzes with multiple-choice questions, etc.) that will account for 5% of the final grade.

As for the practices, the attitude in the laboratory sessions and the report delivered upon their completion will be evaluated, on a date to be determined during the development of the subject. It accounts for 10% of the final grade.

In the seminars, both the document submitted by the student and the presentation of the same will be evaluated. A 5% of will account for the final grade.

A written test will be conducted, consisting of multiple-choice and/or essay questions to assess the level of knowledge and skills of the students. This type of test will account for 80% of the final grade.

It is necessary to obtain a 5 in each of the blocks (continuous evaluation, practices, seminar and written test) to obtain the average of all grades