Universidad Zaragoza

Academic Year/course: 2024/25

27114 - Plant Physiology

Syllabus Information

Academic year: 2024/25
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 is to understand the functioning of photosynthetic organisms known as vegetables or plants, providing students with the essential basic content necessary for the development of plant biotechnology. The course will study how plants function, grow, develop, and interact with the environment. Emphasis will be placed on how climate change is affecting these processes and what types of biotechnological solutions are being developed to address it.

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

1. Introduction to Plant Physiology
2. Plant Cytology, Histology, and Organography
3. Plant Anatomy
4. Movement of Water and Solutes in Plants
5. Mineral Nutrition of Plants
6. Nitrogen Metabolism: Assimilation and Biological Fixation
7. Gas Exchanges: Leaves and Atmosphere
8. Photosynthesis: Light Phase
9. Photosynthesis: the Carbon Reactions
10. Introduction to Plant Development
11. Regulation of Growth and Development: Light
12. Growth and Development: Seeds and Germination
13. Vegetative Growth, Flowering, and Fruiting
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

Special consideration will be given to the ability to relate knowledge and use correct scientific language. For continuous assessment, various activities will be carried out on Moodle (quizzes with multiple-choice questions, etc.), which will account for 5% of the final grade.

Regarding practical sessions, both the attitude during the sessions and the report submitted at the end of them will be evaluated. This will count for 10% of the final grade. The evaluation will be based on the correction of a practical report prepared by the student. If a score of 5 is not reached, the student will have to answer practical questions in the exam.

In seminars, the student's submitted document and clarity of presentation will be evaluated, accounting for 5% of the final grade.

Written tests, consisting of multiple-choice and/or essay questions, will be conducted to assess the level of knowledge and skills of the students. These tests will account for 80% of the final grade.

A score of 5 in each block is necessary to average the final grade.

In addition to what has been previously described, students will have the possibility of being evaluated in a **global test** that will judge the achievement of the learning results previously mentioned.