

27125 - Plant Biotechnology

Syllabus Information

Academic year: 2024/25

Subject: 27125 - Plant Biotechnology

Faculty / School: 100 - Facultad de Ciencias

Degree: 446 - Degree in Biotechnology

ECTS: 6.0

Year: 4

Semester: First semester

Subject type: Compulsory

Module:

1. General information

This subject aims to introduce students to the technologies that are currently being used in various practical aspects concerning plants. The biotechnological tools used for the improvement of plant crops will be studied and the most relevant transgenic crops that have been developed in the history of plant biotechnology will be presented. To take this subject it is recommended to have taken the subjects of Plant Physiology and Genetic Engineering.

2. Learning results

- To know the techniques of micropropagation and "in vitro" cultivation of plants.
- To know haploid production strategies.
- To know germplasm conservation technologies.
- To know the direct and indirect techniques for the transformation of plant material.
- To know the plasmids commonly used to transform plants.
- To know the most relevant transgenics that have been developed throughout plant biotechnology.
- To know the future perspectives of plant biotechnology.

3. Syllabus

Topic 1: Introduction to Plant Biotechnology. Concept and objectives. Historical development.

Topic 2: Characteristics of the plant genome.

Topic 3: Variability in vegetables. Mechanisms of variability.

Topic 4: "In vitro" culture. Micropropagation of plants of interest.

Topic 5: Conservation of plant germplasm.

Topic 6: Introduction to plant breeding methods.

Topic 7: Techniques and vectors for genetic manipulation of plants.

Topic 8: Problems of genetic manipulation in plants. Regulations for the production of transgenics.

Topic 9: Generation of herbicide tolerant strains. Tolerance to pests. Tolerance to abiotic stresses.

Topic 10: Biotechnology contributions to crop yield improvement.

Topic 11: Plant cells as bioreactors.

Topic 12: Future perspectives of plant biotechnology.

4. Academic activities

Lectures: sessions in which the teacher will explain the syllabus of the subject: 35 hours.

Case studies: sessions in which students, with the help of the teacher will prepare and present case studies framed in the field of Plant Biotechnology: 15 hours.

Practical activities: sessions in which students will carry out laboratory practices of "in vitro" cultivation of vegetables: 10 hours.

Personal study. 84 hours

Assessment tests. 6 hours

5. Assessment system

The student must demonstrate achievement of the intended learning results through the following assessment activities:

- The specific competences will be evaluated by means of written tests consisting of exams with essay and multiple choice questions (80% of the grade)
- The practical activities will be evaluated by means of the elaboration of a poster that the students will carry out explaining the results obtained in the laboratory practices (10%)
- Case studies will be evaluated by means of oral presentations given by the students (10% of the grade).

To pass the subject the student must obtain a 5 out of 10 in each of the parts.

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.

6. Sustainable Development Goals

- 2 - Zero Hunger
- 3 - Good Health & Well-Being
- 9 - Industry, Innovation and Infrastructure