

## 28909 - Biology

### Syllabus Information

**Academic year:** 2024/25

**Subject:** 28909 - Biology

**Faculty / School:** 201 - Escuela Politécnica Superior

**Degree:** 583 - Degree in Rural and Agri-Food Engineering

**ECTS:** 6.0

**Year:** 1

**Semester:** Second semester

**Subject type:** Basic Education

**Module:**

### 1. General information

The subject aims to understand the most important and general concepts, theories and models of Biology on molecular, cellular and structural organization of organisms, genetic, physiological and reproductive mechanisms, and evolution and ecological interactions of living beings, so that the student acquires a global vision of the biotic environment and a basic biological training that allow them to apply this knowledge to the theoretical-practical cases of Agroalimentary and Rural Engineering. These approaches and objectives are aligned with some of the Sustainable Development Goals, SDGs, of the 2030 Agenda, namely goals 13 and 15.

### 2. Learning results

Explain and clearly relate the fundamental concepts, models and theories implicit in the science of biology Analyze and synthesize information about the cellular and molecular basis of living things.

Analyze and synthesize information on the biological bases of organismic diversity, and identify objectives and methods for the design and development of activities in biology applied to agri-food.

Develop and exercise skills necessary for laboratory work and basic instrumentation in biology.

Apply the scientific method in Biology, acquiring ethical awareness and environmental sensitivity.

The learning outcomes are aligned with some of the Sustainable Development Goals, and aim to partially achieve the targets:

Target 13.3 Improve education, awareness and human and institutional capacity for climate change mitigation, adaptation, mitigation and early warning.

Target 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and the services they provide, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements.

Target 15.4 By 2030, ensure the conservation of mountain ecosystems, including biodiversity, in order to improve their capacity to provide essential benefits for sustainable development.

Target 15.5 Take urgent and significant steps to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2030, protect endangered species and prevent their extinction.

### 3. Syllabus

Theory:

1. Living beings and genome.
2. Replication
3. Transcription
4. Translation.
5. Gene expression.
6. Epigenetics
7. Cell cycle and cell divisions
8. Sexual reproduction in animals.
9. Sexual reproduction in plants.
10. Self-incompatibility and asexual reproduction in plants
11. Photomorphogenesis and development of plants
12. PhotosynthesisI
13. PhotosynthesisII

14. Physiology and metabolism Nitrogen
15. Evolution.

Practical classes:

1. Microscopy concepts
2. Electron microscopy
3. Animal and plant cell
4. Plastids
5. Bacteria.
6. Mushrooms
7. Genetic code
8. Mitosis.
9. Karyotypes
10. Meiosis.
11. Gametes.
- 12, 13. Enzymes
- 14, 15. Photosynthesis

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

Lectures. Sessions in which the contents of the course are explained: 30 hours

Laboratory practices. Practical laboratory and classroom sessions: 30 hours

Study, teaching assignments and other activities: 84 hours

Assessment 6h

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

1. Written test on the basic theoretical knowledge of Biology: adequacy between question/answer, capacity of synthesis, definition and analysis, and clarity and order of the reasoned answers. The grade for this test will be out of a maximum of 10 points and will represent 50% of the final grade. Minimum qualification to pass the test: 5 points.

2. Written test on basic practical knowledge of Biology: same criteria. The grade for this test will be out of a maximum of 10 points and will represent 50% of the final grade. Minimum qualification to pass the test: 5 points.

If the minimum requirements are not reached in any of the evaluation tests (5 points out of 10) the course will not be considered passed even if the final grade averaged CF, is equal or higher than 5. In this case, the final grade that will reflect in the minutes of the subject will be:

If final grade averaged,  $CF > 4$ , Fail, 4.

If final grade averaged,  $CF < 4$ , Fail, CF

Success rate of the subject in recent years: 2019/2020: 85.96%; 2020/2021: 18.18%; 2021/22: 30.95%; 2022/23: 48%

#### **6. Sustainable Development Goals**

- 4 - Quality Education
- 13 - Climate Action
- 15 - Life on Land