COURSE DATA

DATA SUBJECT

Code: 33078
Name: Biology
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
1104 - Degree in Environmental Sciences	Facultat de Ciències Biològiques	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1104 - Degree in Environmental Sciences	Biology	BASIC

COORDINATION

CASTELLO RUIZ MARÍA

TOMAS AGUIRRE JESUS

SUMMARY

Biology is a subject of 6 ECTS credits and belongs to a set of subjets that are collectivelly called "General Scientific Basis" in the Degree in Environmental Sciences. Is is taught in the first semester of the first year. This set of subjects are intended for mastering basic general knowledge of the branch of science.

Biology is one of the core disciplines in environmental sciences since living beings are part of the environment and interact with it. The intrinsic value of biodiversity makes necessary its study and its conservation. In addition, advances in the understanding of cellular aspects, and of molecular and functional organization have helped to develop useful applications in environmental monitoring and remediation, among others. The skills acquired through this subject will form the basis for the student to address later in the Degree other more specialized biological subjects (Botany, Zoology, Environmental Microbiology and Ecology) as well as many other subjects with a biological component.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

COMPETENCES / LEARNING OUTCOMES

1104 - Degree in Environmental Sciences

Adquirir, desarrollar y ejercitar destrezas necesarias para el trabajo de laboratorio y la instrumentación básica en física, química y biología.

Conocer y comprender la estructura y función de las biomoléculas.

Conocer y comprender la estructura y función de los seres vivos.

Conocer y comprender las bases de la diversidad biológica.

Conocer y comprender las bases del metabolismo celular.

Conocer y comprender los niveles de organización de los seres vivos.

DESCRIPTION OF CONTENTS

1. INTRODUCTION

- Concept and Definition of Biology.
- Hierarchy of biological organization.
- Biology as an end and as a tool in environmental sciences
- Relationship with other subjects of the degree

2. ORGANIZATION AND FUNCTION MOLECULAR AND CELLULAR

- Structure and function of macromolecules.
- The Cell.
- Introduction to cellular metabolism.
- Cellular respiration.
- Photosynthesis.
- Molecular basis of heredity.
- DNA replication and repair.
- Flow of genetic information.

3. ANIMAL AND PLANT PHYSIOLOGY

- Structure of the plants.
- Introduction to Plant Physiology.
- Functional organization of the animals.
- The internal environment and its regulation.
- Bioenergetics.
- Control systems.

4. CONTINUITY OF LIFE

- Chromosomes, mitosis and meiosis.
- Reproduction: definition and types.
- Agamic, gamic and alternating reproduction.
- Life cycles.
- Gametogenesis.
- Fertilization and activation of the ovocyte.
- Basic principles of heredity.
- Mendelian and populational genetics.

5. INTRODUCTION TO BIODIVERSITY

- Theories about the origin of life.
- Domains and Kingdoms. Hypotheses of origin.
- Phylogeny and classification.
- Structural plans. Taxonomy and nomenclature.
- Concept of species. Evolution and natural selection.
- Evolutionary change in populations.
- Speciation and macroevolution. Biomes.
- Biogeography.
- Ethology.
- Migration.
- Sexual selection.
- Social behavior

6. PRACTICAL SESSIONS 1: Biomolecules

Extraction of chlorophyll and hemoglobin and obtaining their absorption spectra.

7. PRACTICAL SESSIONS 2: Observation of cells and tissues

Preparation and microscopic observation of cells and tissues from animals and plants.

8. PRACTICAL SESSIONS 3: Observation and quantification of animal function

Effect of temperature on heart rate in Daphnia.

9. PRACTICAL SESSIONS 4: Animal behaviour.

Observation and study of Apis Mellifera behavior in relation to the search for food. Interaction and communication between individuals within the hive.

10. PRACTICAL SESSIONS 5: Biodiversity

Urban itinerary for observation and identification of flora and fauna. Differences in biodiversity between habitats. Differentiation between autochthonous, colonizing and invasive species.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Tutorials	3,00
Theory	45,00
Laboratory	12,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	10,00
Independent study and work	40,00
Preparation of lessons	20,00
Preparation for assessment activities	20,00
Resolution of case studies	0,00
Total hours	**90,00**

TEACHING METHODOLOGY

1. **Theoretical lectures.** These will consist of lecture-based sessions delivered sequentially throughout the academic year, so that they are integrated with the other proposed activities. The audiovisual materials used may include slides, computer presentations, or video projections.

2. **Laboratory practical classes.** These will consist of four practical laboratory sessions. In each session, students will carry out the proposed activities after reading the corresponding instructions. At the end of each session, students will complete and submit a questionnaire related to the practical work undertaken.
3. **Field trip.** A field trip will be organised along a previously selected itinerary of educational value.
4. **Group tutorials.** These will be held upon completion of each thematic block. They will consist of two sessions devoted to activities aimed at developing transversal competences while also addressing complementary theoretical contents included in the course syllabus.
5. **Interdisciplinary practical activity.** This activity is coordinated with the course Introduction to Environmental Sciences Studies. Students will prepare and present, in groups, an electronic poster on a biological topic. To complete this activity, they will apply the knowledge acquired in the course Introduction to Environmental Sciences Studies regarding bibliographic searches and scientific communication formats.

The purpose of this activity is to ensure that, by the end of the module, students are able to access bibliographic databases, use electronic presentation tools, and deliver a scientific oral presentation.

To promote coordination between both courses, each group will prepare a single assignment that will be jointly assessed, and the mark obtained will contribute to the final grade of both subjects.

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EVALUATION

The assessment of the course will take into account the different activities carried out throughout the semester, and the final mark will be calculated according to the following percentages:

- **Theoretical contents (65%)**: assessed through a written examination combining short-answer reasoning questions and multiple-choice questions.
- **Practical contents (15%)**: assessed through a written examination combining short-answer reasoning questions and multiple-choice questions.
- **Tutorials (10%)**: assessed through a written test consisting of short-answer reasoning questions (5%) and through the preparation and participation in assessment activities (assignments and presentations) proposed by the lecturer to evaluate the acquisition of the contents covered during these sessions (5%).
- **Interdisciplinary practical activity (10%)**: the activity will be assessed according to the scientific content of the poster, compliance with the guidelines for the preparation of a scientific poster, the appropriate use of bibliographic sources, and the quality of the students' oral presentation.

To pass the course, students must obtain an overall mark of at least five out of ten and must also pass independently the theoretical component, the practical component, and the interdisciplinary practical activity. Students who do not pass in the first examination period may sit the corresponding examinations in the second period, retaining the marks obtained in the components passed during the same academic year.

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REFERENCES

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- Slater, P.B.J. (2000). El comportamiento animal. Ed. Cambridge University Press.
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