COURSE DATA

DATA SUBJECT

Code: 33078
Name: Biology
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

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	17,00
Independent study and work	0,00
Preparation of lessons	45,00
Preparation for assessment activities	28,00
Resolution of case studies	0,00
Total hours	**90,00**

TEACHING METHODOLOGY

1.- Magistral lessons to be taught sequentially throughout the academic year, so that they are integrated with other proposed activities. The audiovisual material used may include transparencies, powepoint like softwer elaborated presentation or video projections.

2 .- Laboratoy sessions. To be held in 4 sessions of laboratory practices. Students perform the proposed activities after reading the appropriate instructions. After each session they will respond to a questionnaire issued at the end of the same.

3.-A educational tour itinerary will be selected.

4 .- The collective tutorials will be made on completion of thematic teaching. Each of the two planned sessions are one hour and a half and they are used to resolve the doubts raised by the students regarding the topics taught, before proceeding with the agenda and into the next block of items. Interactive activities are also proposed to assist the approach and resolve doubts.

5 .- Interdisciplinary seminar

The students will present a group work as a complementary activity to ensure that at the end of the module they know how to to access to bibliographic databases, and how to make a presentation. This work is done in coordination with the subject of "Incorporación a los estudios en Ciencias Ambientales". Each student will elaborate and present a single work for both subjects and the obtained mark will be considered in the two subjects. The instructions for this activity and the delivery of documents by students will be made through Aula Virtual.

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EVALUATION

The evaluation of the course will take into account the different activities in such a way that the total score is obtained based on the following percentages:

- Theory: 65%. This will be assessed by a final examination. The examination may consist of short questions, preferably reasoned, and/or multiple choice questions.
- Practical work: 15%. To be assessed by a final examination. The examination may consist of short questions, preferably reasoned, and/or multiple-choice questions. Attendance and use of practical sessions will also be assessed.
- Tutorials: 10%. This will be assessed by a final exam and by the preparation of and participation in assessment activities (assignments and presentations) proposed by the lecturer to assess the acquisition of the content covered in these sessions.
- Interdisciplinary Seminar: 10%. Preparation, participation and use of the seminars will be assessed.

To pass the course the student must achieve an overall mark of not less than five and must pass each of the activities: practice, theory and seminars independently. Students who fail in the first call may retain the score got in the passed activities.

To apply for the advancement of the exam of this subject, students should be aware that the mandatory activities outlined in this guide have to be accomplished. The mandatory activities are: the seminar and the practices.The evaluation will take place in three different sections: seminars (15%), practical (15%) and

examination (70%).

REFERENCES

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