

Laboratory II

Code: 101946
 ECTS Credits: 3

Degree	Type	Year	Semester
2500890 Genetics	OB	1	2

Contact

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Use of languages

Principal working language: spanish (spa)

Some groups entirely in English: No

Some groups entirely in Catalan: Yes

Some groups entirely in Spanish: Yes

Prerequisites

- Students enrolled in this course for the first time should be enrolled simultaneously in the subjects: Animal and Plant Biology, Biochemistry and Animal Physiology.
- Student must have passed the laboratory safety and biosecurity test, and be knowledgeable and accept the safety and biosecurity rules.
- Students should review the theoretical contents of each laboratory unit.
- All the laboratory units are mandatory.

Students who do not wear a laboratory coat cannot enter the laboratory.

Objectives and Contextualisation

The Integrated Laboratory II is the second laboratory course of a set of six that are distributed throughout six semesters.

These laboratory courses aim to provide a solid basis for experimental procedures, techniques and skills in general.

The laboratory practices reinforce the theoretical concepts acquired in the theory classes, allowing to fully understand them.

The Integrated Laboratory II has as its training objectives the acquisition of experimental competencies in 3 specific areas:

- Animal and Plant Biology
- Biochemistry
- Animal Physiology

Animal and Plant Biology

Botany

To learn how to recognize cyanobacteria, photosynthetic aquatic eukaryotes, higher plants and fungi through their morphological characteristics.

To identify the fundamental structures and their relevance through their most common representatives, in order to understand the evolution and morphological diversity.

Plant physiology

To determine the Water Potential (Ψ) of a fresh vegetable tissue analysing the weight variations produced when it is exposed to different concentrations of sucrose.

To study the Hill Reaction in a suspension of isolated chloroplasts, using DPIP as an artificial electron acceptor. To calculate the maximum rate of photosynthesis.

Observation of the plasmolysis phenomenon in epidermal cells of onion bulb and calculation of its Allium strain osmotic pressure.

Zoology

To identify the anatomical and morphological characteristics of different animal groups.

Taxonomical identification and location of the different animal species observed.

To learn how to use dichotomous keys for animal determination.

Biochemistry

Be able to apply spectrophotometric techniques for the quantification and analysis of biomolecules.

Be able to use liquid chromatography, as one of the most common tools in the analysis and separation of biomolecules.

Be able to separate and analyze polypeptides by denaturing electrophoresis on polyacrylamide gel (PAGE-SDS).

Be able to perform simple tests to analyze the catalytic capacity of enzymes.

Animal Physiology

This module is complementary to the theoretical concepts studied in the course "Animal Physiology". The objective is to:

Acquire and consolidate basic notions of behaviour in an experimental biomedical laboratory.

Become familiar with some of the experimental techniques that have allowed the development of Physiology.

Interpret and critically evaluate laboratory results relative to real or induced situations from a physiological point of view.

Recognize a professional path in Physiology.

Develop critical, organization and synthesis abilities.

Content

Animal and Plant Biology module

Botany

Practice 1: Cyanobacteria and Eukaryotic Aquatic Photosynthesis

Practice 2: Spermatophytes (Angiosperms)

Practice 3: Fungi and Lichens.

Plant Physiology

Practice 1: Determination of the water potential in vegetables

Practice 2: Study of the Hill reaction in isolated chloroplasts and their inhibition by DCMU.

Practice 3: Osmotic potential assess. Method of incipient plasmolysis

Zoology

Pr. 1. Sponges, Cnidarians and Flatworms

Pr. 2. Mollusks and Annelíds

Pr. 3. Arthropods

Pr. 4. Chordata

Biochemistry module

Practice 1: Determination of the concentration of glucose by a colorimetric method. Absorption spectrum of a glu

Practice 2: Chromatography of gel filtration: Separation of hemoglobin from vitamin B12 and dextrase blue. Sepa

Practice 3: Enzymatic activity of acid phosphatase. Determination of initial speeds to calculate kinetic parameters

Animal Physiology module

1. Nervous action potential - LabAXON (computer simulation)

Place: Computer room

Estimated duration: 3h

Contents: Study of neuronal action potential characteristics with a computer simulation.

Definition and calculation of neuronal activity parameters.

2. Spirometry - Performance and interpretation of a functional respiratory test (spirometry)

Place: Laboratory of practices (to be determined)

Estimated duration: 3h

Contents: Making and interpretation of a simple spirometry.

Calculation of parameters related to the respiratory function.

3. Enzymatic digestion - Determination of enzymatic activity of human salivary amylase

Place: Laboratory of practices (to be determined)

Estimated duration: 3h

Contents: Obtaining human salivary amylase.

Evaluation of the enzymatic activity in different experimental conditions: Type of substrate, temperature and

4. Comparative anatomy: Dissection of a rat

Place: Laboratory of practices (to be determined)

Estimated duration: 3h

Contents: Making a necropsia (partially regulated) of a laboratory rat.

Recognition of the basic anatomical organization of a mammal.

Recognition of the main organs.

Making basic anatomical-functional relationships