

**Integrated Laboratory Class 1**

Code: 100886  
ECTS Credits: 3

Degree	Type	Year	Semester
2500252 Biochemistry	OB	1	1

**Contact**

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**Use of languages**

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: Yes  
Some groups entirely in Spanish: No

**Prerequisites**

The student must attend simultaneously or have taken the theory subjects, which are taught during the same semester, corresponding to the contents of the practices of this subject,

In order to attend the laboratory classes it is necessary for the student to justify having passed the biosecurity and security tests that you will find in the Virtual Campus and be knowledgeable and accept the operating rules of the Bioscience Laboratories.

The test is answered in the corresponding space of the Virtual Campus and the information that must be consulted is in the communication space of the Degree in Biochemistry.

It is advisable for students to review the theoretical contents on which this subject is based

**Objectives and Contextualisation**

The subject Integrated Laboratory 1 is part of a set of six subjects that are distributed throughout the first six semesters of the Degree in Biochemistry.

The training objective of these subjects is the acquisition of practical skills by the student.

The contents are organized in increasing order of complexity, associated with the needs and acquisition of theoretical contents.

During the Integrated Laboratory 1 the student acquires practical competences in the contents:

- Physical
- Cellular Biology

- Basic Instrumental Techniques
- Fundamentals of Chemistry
- Mathematics.

Practices in the laboratory focus on learning basic techniques specific to each field and on the characteristics of working in the laboratory.

## Content

The subject is structured in 4 types of contents.

### Cell Biology

#### Contents:

Practice 1 (2h). Introduction to the optical microscope and observation of plant cells. Description of the optical microscope elements and microscope usage phonemes. Obtaining temporary preparations for different vegetable plants (pepper, Elodea) observation of the morphology of plant cells and their main components: cell wall, nucleus, chloroplasts, chromoplasts, plasmodesms.

Practice 2 (2h). Observation of animal cells through optical microscope. Observation of the morphology of the different types of animal cells: cells of the buccal mucosa, fibroblasts and sperm.

Practice 3 (2h). Electronic microscopy. Fonts of electronic microscopy. Recognition and measurement of different structures is organic cell and micrographs of SEM and TEM.

Practice 4 (2h). Osmosis and simple diffusion. Studying the Phenomenon of the Osmoses in Cells of a leaf of Elodea exposes a different concentration of NaCl. Study of the simple diffusion of the alcohols through the membrane of cells of a leaf of Elodea.

Practice 5 (2h). The mitotic cell division. Obtención de preparaciones temporales de títulos vegetales para la observación y reconocimiento de las diferentes etapas de la mitosis y la determinación de la duración.

Practice 6 (2h). The meiotic cell division. Observation of the different phases of the meiotic cycle of insect spermatogenesis.

### Basic Instrumental Techniques

#### Continguts

Practice 1 (4h).

Determination of the concentration of glucose by a metric dye.

Analysis of an absorption spectrum.

Practice 2 (4h).

Filtration gel chromatography: separation of hemoglobin from vitamin B12 and dextra blue.

Separation of proteins by electrophoresis in SDS. Preparation of the gel (which is far from the drawer).

Practice 3 (4h).

Determination of proteins of animals protected by SDS electrophoresis (Example: actin and myosin).

## Phonemes of Chemistry

Continguts

Practice 1 (4h)

Determination of the degree of acidity of a commercial vinegar.

Concept: Assessment of a weak acid.

Practice 2 (4h)

Separation of a mixture of Benzoic Acid, 1,3-dinitrobenzene and Aniline

Simple extraction concept: Extraction with a basic aqueous and acid phase

## Physics

Continguts

Practice 1 (3h)

Instruments for measuring lengths: the little king, the Palmer and the spherometer.

Instruments of mass measurement: the granary balance.

Assimilation of error concepts, precision and magnitude of a measure.

Practice 2 (3h)

Analysis of the sedimentation processes of a low number of Reynolds.

Determination of the viscosity coefficient of liquids from the Stokes stage.

Practice3 (3h)

Assimilation of electromagnetic phenomena that occur in the mass spectrometer.

Determination of the temperature of the earth / mass of electricity.

Practice 4 (4h)

Study of the different types of penetration of alpha, beta and gamma radiation.

Analysis of the absorption capacity of radiation (shielding) by different materials.

## Mathematics module

We will learn to carry out an algebraic manipulator by performing calculations and representing graphs of functions of one

Variable We will work on mathematical modeling of physical, chemical and biological phenomena.

### Continguts

P1 (2h): Introduction: The syntax of the manipulator.

P2 (2h): Functions of a variable: its graphs, how to derive them, how to integrate them.

P3 (2h): Applications: Growth of the functions, maximum and minimum, convexity. Graphical representation of functions. Optimization issues.

P4 (2h): Differential equations. Applications

P5 (2h): Test of consolidation of contenders.