

Degree	Type	Year
Biomedical Sciences	OB	1

## Contact

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## Teachers

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## Teaching groups languages

You can view this information at the [end](#) of this document.

## Prerequisites

No official prerequisites are defined for this subject. However, it is recommended that the student has acquired the basic knowledge and competences of the subjects corresponding to Cell Biology, Biochemistry and Molecular Biology, and Biophysics.

## Objectives and Contextualisation

The subject *Histology and General physiology* is programmed during the second semester of the first course of the Degree of Biomedical Sciences and develops the knowledge of the basic principles of the function of cells and tissues of the human organism. The acquisition of the competences of this subject will allow the student to be well prepared to confront the study of the histology physiology of the different systems of the human body during the second course.

The general training objectives of the course are:

- Differentiate different types of tissues by their histological and functional characteristics.
- Identify the different cell types that constitute each tissue and describe its most important differential characteristics.
- To learn the basic mechanisms of body tissue operation.
- Use textbooks, atlases and specific Internet resources for the study of matter.
- Develop with ease in the management of the optical microscope and the study of histological preparations.

- To learn the electrophysiological techniques for evaluating the nervous and muscular system.

Unless the restrictions imposed by the health authorities require a prioritization or reduction of such content.

## **Learning Outcomes**

1. CM08 (Competence) Analyse measurable experimental parameters in tissues in normal or pathological physiological conditions, integrating this data to interpret biological significance.
2. CM09 (Competence) Orally communicate the fundamental aspects of a topic in the field of molecular biology and histology to specialist and non-specialist audiences.
3. KM09 (Knowledge) Describe the morphological and biochemical characteristics of tissues and cells in the human body.
4. KM10 (Knowledge) Identify functional heterogeneity in tissue and certain experimental methods for its observation.
5. KM11 (Knowledge) Identify the molecular mechanisms that regulate cell size and differentiation stage in tissues.
6. SM10 (Skill) Apply bioinformatics resources when searching for information in databases on molecular and histological processes in the human body.
7. SM11 (Skill) Use histological, immunological and molecular techniques to study human pathologies.
8. SM12 (Skill) Microscopically identify the different organs and tissues of the body.

## **Content**

### GENERAL HISTOLOGY

#### INTRODUCTION TO HISTOLOGY

- Concept of fabric
- Basic techniques in histology
- Classification of tissues.

#### EPITHELIAL TISSUE

- Concept of epithelial tissue
- Lining epithelia.
- Glandular epithelia.

#### CONNECTIVE TISSUE

- Concept of connective tissue
- Connective tissue components (matrix and cells)
- Varieties of connective tissue
- Differential characteristics of connective tissues: connective, blood, adipose, cartilage and bone

#### MUSCLE TISSUE

- Concept of muscle tissue

- Varieties of muscle tissue.
- Skeletal muscle tissue
- Cardiac muscle tissue.
- Smooth muscle tissue.

## NERVOS TISSUE

- Concept of nervous tissue: peripheral and central nervous system
- Nervous tissue cells (neurons and glial cells)
- Concept of synapses.

## GENERAL PHYSIOLOGY

### INTRODUCTION

- Basics of cell physiology
- Function of cellular compartments

### IONIC TRANSPORT THROUGH THE CELL MEMBRANE Cell

- Concentrations in intracellular and extracellular medium ions
- Diffusion through the cell membrane. Ionic channels

### PHYSIOLOGY OF CELLS EPITHELIAL CELLS

- Functional structure of the epithelium
- Epithelial Transport
- Physiology of the epithelial glands. Secretion mechanisms

### ELECTRICAL CELLULAR PHENOMENA CELLULAR

- Transmembrane resting potential
- Local potential and excitability
- Action potential.Spread of action potential

### SYNAPTIC TRANSMISSION

- Electric synapses.
- Chemical synapses. Synapses structure and function
- General characteristics of the chemical neurotransmission
- Postsynaptic Receptors.Postsynaptic potentials

### MUSCLE EXCITATION AND CONTRACTION

- Functional organization of striated muscle fibers
- Electrical phenomena
- Mechanical phenomena

- Variations in muscle contractility
- Energetic muscle contraction
- Types of skeletal muscle fibers
- Contraction of smooth muscle fibers
- Contraction of skeletal muscle

#### AXONAL REGENERATION AFTER INJURIES TO THE NERVOUS SYSTEM

- Walleriana Degeneration
- Axonal regeneration in peripheral nervous system injuries
- Axonal regeneration in lesions of the central nervous system

### Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Lectures	36	1.44	
Seminars	10	0.4	
Type: Supervised			
Individual tutorials	4	0.16	
Type: Autonomous			
Resolution of problems	10	0.4	
Study	70	2.8	
Work Elaboration	10	0.4	

#### Lectures:

Systematic explanation of the subject topics, giving relevance to the most important concepts. The student acquires the basic scientific knowledge of the subject in theory classes, which will be complemented by self study of the themes of the subject program

#### Seminar Sessions:

Presentation and work on cases or problems of relevance for the learning of the subject. The knowledge acquired in the theory classes and in the personal study are applied to the resolution of practical cases that are posed in the seminars. Students work in small groups.

#### Tutorials

The tutorials will be done in a personalized way to the teacher's office (hours to be agreed). The tutorías aim to clarify concepts, to establish the acquired knowledge and to facilitate the study by the students. They can also be used to resolve doubts that students have about preparing the seminars.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Assessment

### Continuous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Preparation and presentation of the problems and cases (Histology)	10	1	0.04	CM08, CM09, KM09, KM10, KM11, SM10, SM11, SM12
Preparation and presentation of the problems and cases (Physiology)	10	3	0.12	CM08, CM09, KM09, KM10, KM11, SM10, SM11, SM12
Theory exam (Histology)	40	4	0.16	CM08, KM10, KM11, SM12
Theory exam (Physiology)	40	2	0.08	CM08, CM09, KM11

### Evaluation

The evaluation of the subject will be based on the theoretical and practical content of the subject.

Each module of the subject will be evaluated individually.

Modules for the evaluation of Histology and General Physiology are the following:

-General Histology

-General Physiology

1. Continuous evaluation:

#### Module: General Histology

The evaluation system is organized in two sections, each of them will be evaluated independently and assigned a specific weight in the final grade of the module:

- Examination of objective tests (40% of the final grade). A written test will be carried out at the end of the contents of the General Histology program that may contain multiple choice questions, identification of images, and/or clinical cases. If it is obtained a grade lower than 4 (out of 10) in this test, it will not be able to weight this grade with that obtained in the seminars, and consequently, the student will have to perform the retaking exam.

- Seminars (10% of the final grade). Attendance at seminars is mandatory.

#### Module: General Physiology

The evaluation system is organized in two sections, each of them will be evaluated independently and will be assigned a specific weight in the final grade of the module:

- Examination of objective multiple-choice and/or written tests on the knowledge acquired (40% of the final grade). Students who have obtained a grade lower than 5 (out of 10) in this test will not be able to weight tis grade with that obtained in the presentation of problems andcases and, therefore, they must perform the retaking exam.

- Evaluation of the preparation and presentations of the problems and cases (activity evaluated through the Moodle application) (10% of the final grade)

To pass the subject, each of the two modules must be passed with a minimum grade of 5.0 in the same academic year. In this case, the final grade will be the average of the marks obtained in each of the two modules of the subject. In case of not passing any of the two modules, the maximum grade obtained will be 4.8.

It will be considered as "not evaluable" those students who do not perform the partial and retaking exams.

### Retaking examination

A retaking exam will be held to those students who have not passed the subject in the continuous evaluation. Students will be only evaluated of the modules that have not been passed in the continuous evaluation of the same academic year.

The retaking exam of each module will consist in objectifiable tests of multiple choice, and/or written, and/or identification of images related to the content of the subject.

## 2. Single evaluation

Students can benefit from the single evaluation system, according to the regulations of the Faculty. The single evaluation will be based on the same content of the program of the subject, the acquisition of the same competences, and will have the same level of demand as the continuous evaluation.

The single evaluation will consist of tests carried out by each of the two modules of the subject that will be carried out on the same date.

For the evaluation of each module, an exam consisting of multiple-choice questions and/or written questions and/or identification of images will be carried out to evaluate the theoretical knowledge of the subject and the concepts related to the seminars/cases, with a weighting of 80% and 20%, respectively, of the overall grade of each module.

To pass each module it will be necessary to obtain a minimum of 5.0 in the exam.

To pass the subject it will be necessary to have passed all the two modules with a minimum of 5.0. In this case, the final grade will be the average of the grade obtained in each of the two modules. In case of not passing any of the two modules, the maximum grade obtained will be 4.8.

Retaking exam. The same system will be applied as for continuous evaluation.

It will be considered as "not evaluable" those students who do not perform the partial and retaking exams

## **Bibliography**

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## Software

No specific software is used

## Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(SEM) Seminars	511	Catalan	second semester	morning-mixed
(SEM) Seminars	512	Catalan	second semester	morning-mixed
(TE) Theory	51	Catalan	second semester	afternoon