



## Information about the subject

**Degree:** Bachelor of Science Degree in Podiatry

**Faculty:** Faculty of Medicine and Health Sciences

**Code:** 471106 **Name:** Cellular and Tissular Biology

**Credits:** 6,00 **ECTS Year:** 1 **Semester:** 1

**Module:** BASIC TRAINING

**Subject Matter:** BIOLOGY **Type:** Basic Formation

**Field of knowledge:** Health Sciences

**Department:** -

**Type of learning:** Classroom-based learning

**Languages in which it is taught:** Spanish

**Lecturer/-s:**



## Module organization

### BASIC TRAINING

Subject Matter	ECTS	Subject	ECTS	Year/semester
ANATOMY	12,00	Anatomy	6,00	1/1
		Anatomy of the Lower Extremity	6,00	1/2
BIOLOGY	12,00	Cellular and Tissular Biology	6,00	1/1
		Microbiology	6,00	1/2
PHARMACOLOGY	6,00	Pharmacology	6,00	2/1
MODERN LANGUAGE	6,00	English	6,00	2/2
STATISTICS	6,00	Biostatistics	6,00	1/1
PSYCHOLOGY	6,00	Psychology	6,00	1/2
PHYSIOLOGY	6,00	Physiology	6,00	1/1
BIOCHEMICALS	6,00	Biophysics and Biochemistry	6,00	1/1
ANTHROPOLOGY	6,00	Anthropology	6,00	1/2

## Recommended knowledge



## PREREQUISITES:

It has no presets.

## OBJECTIVES:

a. Present the cell as the structural and functional unit of all living things. b. Introduce the basic concepts about the transmission of genetic information. c. Know the structure, composition and functioning of the different structures and subcellular organelles. d. Know the main techniques for the observation of cells and tissues and in which contexts to use them. e. Introduce the student to the laboratory of cell biology and histology. f. Present cell and tissue biology as the body of basic knowledge in which other areas of study are based and its relationship with other basic subjects studied in the Degree. g. Know the concept, types and functions of tissues.

## Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

- R1 The student distinguishes the different levels of organization of living beings.
- R2 Knows how to use different work techniques in the laboratory.
- R3 Identifies cellular structures and organelles.
- R4 The student interprets results obtained in the practices.
- R5 The student is able to elaborate documents on cell biology.
- R6 Interprets laboratory results. Laboratory of Clinical Biochemistry.
- R7 Evaluates the basic biochemistry of metabolism.
- R8 Assesses basic organ-systemic pathology at the laboratory level.
- R9 The student acquires basic notions of liquids: urine, cerebrospinal fluid, synovial and toxicology.



## Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are (please score from 1 to 4, being 4 the highest score):

BASIC		Weighting			
		1	2	3	4
CB1	Students demonstrate knowledge and understanding in an area of study that is at the core of general secondary education, and is often at a level that, while supported by advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study.		X		
GENERAL		Weighting			
		1	2	3	4
CG2	Students know the structure and function of the human body, especially of the lower limb, semiology, mechanisms, causes and general manifestations of the disease and diagnostic methods of medical and surgical pathological processes, interrelating general pathology with foot pathology.		X		
CG3	Students develop the capacity, ability and skill necessary to diagnose, prescribe, indicate, perform and/or elaborate and evaluate any type of podiatric, orthopedic, chiropractic, podiatric surgery, physical, pharmacological, preventive and/or educational treatment, based on the clinical history.	X			
CG7	Students know, design and apply preventive programs related to podology and the promotion of podiatric care in the population.	X			
SPECIFIC		Weighting			
		1	2	3	4
CE25	Acquire knowledge about cell and tissue biology. Composition and organization of the matter of living beings. Histology. Genetics				X



TRANSVERSAL		Weighting			
		1	2	3	4
CT1	Analytical capabilities			x	
CT2	Organizational and planning skills		x		
CT5	Computer skills related to the field of study		x		
CT6	Information management capacity	x			
CT7	Problem solving			x	
CT8	Decision making		x		
CT9	Teamwork			x	
CT10	Interdisciplinary teamwork				x
CT14	Critical Reasoning			x	
CT15	Ethical commitment			x	
CT16	Autonomous learning		x		
CT17	Adaptation to new situations		x		
CT22	Motivation for quality			x	



## Assessment system for the acquisition of competencies and grading system

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R7, R9	60,00%	Tests
R1, R2, R5	15,00%	Oral presentation
R3, R4, R5, R6, R7, R8	20,00%	Practice (exercises, case studies, problems)
R1, R2, R3, R4, R5	5,00%	Class participation

### Observations

The subject and / or matter is organized in TRAINING ACTIVITIES OF PRESENTIAL WORK and in TRAINING ACTIVITIES OF SELF-EMPLOYED WORK OF THE STUDENT, with an estimated percentage in ECTS. An adequate distribution is as follows: 35-40% for face-to-face training activities and 65-60% for those of autonomous work. (For a 6 ECTS subject: 2.4 and 3.6 respectively).

The teaching-learning methodology is described in this guide in a generic way, specifying in the didactic units in which the subject and / or subject is organized.

### MENTION OF DISTINCTION:

According to Article 22 of the Regulations governing the Evaluation and Qualification of UCV Courses, the mention of "Distinction of Honor" may be awarded by the professor responsible for the course to students who have obtained, at least, the qualification of 9 over 10 ("Sobresaliente"). The number of "Distinction of Honor" mentions that may be awarded may not exceed five percent of the number of students included in the same official record, unless this number is lower than 20, in which case only one "Distinction of Honor" may be awarded.

## Learning activities

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:



- M1 Theoretical classes (TC). Training activity preferably oriented to the acquisition of knowledge skills. It is characterised by the fact that students are spoken to. Also called master class or expository class, it refers to the oral exposition made by the teacher, (with the support of a blackboard, computer and cannon for the exposition of texts, graphics, etc.).
- M2 Seminars (S). Training activity preferably oriented to obtain knowledge application and research competences. Knowledge is built through interaction and activity. Consisting of supervised monographic sessions with shared participation (Teachers, students, experts). The size of the group is variable, from a large group to small groups, no less than 6 students for interaction. The evaluation will be made by means of follow-up records by the teacher. Participation and development of problem-solving skills should be taken into account.
- M6 Laboratory Practice (CPL). Training activity of work in groups that is developed in the Laboratory. It includes the sessions where students actively and autonomously develop, supervised by the teacher, laboratory experiments. The size of the group is variable, in a range of 10-20 students.
- M7 Tutorials (T). Set of activities carried out by the teacher with personalised attention to the student or in small groups with the aim of reviewing and discussing the materials and topics presented in the classes, seminars, readings, completion of assignments, etc. The aim is to ensure that education is truly a comprehensive training of the student and is not reduced to a transfer of information. It is, therefore, a personalized relationship of help in which the teacher-tutor attends, facilitates and guides one or more students in the formative process.
- M8 Evaluation (Ev). It is the set of processes that try to evaluate the learning results obtained by the students and expressed in terms of acquired knowledge, capacities, developed skills or abilities and manifested attitudes. It covers a wide range of activities that can be developed for students to demonstrate their training (e.g. written, oral and practical tests, projects or assignments,). It also includes Official Calls.
- M10 Estudio del alumno: Preparación individual de lecturas, ensayos, resolución de problemas, seminarios



## IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Theoretical lessons M1	R1, R2, R5, R9	39,00	1,56
Seminar M2	R1, R2, R3, R4, R5, R6, R7, R8, R9	7,50	0,30
Practice lessons M6	R2, R3, R4, R6, R8	7,50	0,30
Office Hours M7	R1, R2, R9	2,00	0,08
Evaluation M8	R1, R2, R3, R4, R5, R6, R7, R8, R9	4,00	0,16
<b>TOTAL</b>		<b>60,00</b>	<b>2,40</b>

## LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Autonomous work M10		70,00	2,80
Group work M10		20,00	0,80
<b>TOTAL</b>		<b>90,00</b>	<b>3,60</b>





## Description of the contents

Description of the necessary contents to acquire the learning outcomes.

### Theoretical contents:

Content block	Contents
DIDACTIC UNIT I: INTRODUCTION TO CELL BIOLOGY	Presentation of the subject.1. Origin and evolution of the first cells. Theorycellular. Prokaryotic and eukaryotic cells
DIDACTIC UNIT II: THE PLASMA MEMBRANE AND THE ENDOMEMBRANE SYSTEM	2. Structure and function of the plasma membrane.3. Permeability and transport through the membrane.4. Endomembrane system.5. Endocytosis and exocytosis.6. Cell signaling.
DIDACTIC UNIT III: CYTOSKELETON	7. Structure and function of the cytoskeleton. Microtubules, microfilaments and intermediate filaments.
DIDACTIC UNIT IV: THE NUCLEUS	8. Core components. The DNA text. Packaging of DNA into chromosomes. Ribosomes.
DIDACTIC UNIT V: THE CELL CYCLE	9. The cell cycle, cell division: mitosis and meiosis
DIDACTIC UNIT VI: GENETICS	10. Foundations of genetics. The inheritance of genetic material.11. Chromosomal alterations.12. The flow of genetic information. Biochemical genetics.
DIDACTIC UNIT VII: INTRODUCTION TO HISTOLOGY	13. Introduction. Knitting concept. Tissue classification
DIDACTIC UNIT VIII: TYPES OF FABRICS	14. Epithelial.15. Connective (conjunctive, adipose, cartilaginous, bone, blood and lymph).16. Muscular.17. Nervous.
DIDACTIC UNIT IX: METHODS OF STUDY IN HISTOLOGY	18. Conventional histological techniques. Specific histological techniques.



## Temporary organization of learning:

Block of content	Number of sessions	Hours
DIDACTIC UNIT I: INTRODUCTION TO CELL BIOLOGY	1,00	2,00
DIDACTIC UNIT II: THE PLASMA MEMBRANE AND THE ENDOMEMBRANE SYSTEM	5,00	10,00
DIDACTIC UNIT III: CYTOSKELETON	2,00	4,00
DIDACTIC UNIT IV: THE NUCLEUS	2,00	4,00
DIDACTIC UNIT V: THE CELL CYCLE	2,00	4,00
DIDACTIC UNIT VI: GENETICS	4,00	8,00
DIDACTIC UNIT VII: INTRODUCTION TO HISTOLOGY	1,00	2,00
DIDACTIC UNIT VIII: TYPES OF FABRICS	11,00	22,00
DIDACTIC UNIT IX: METHODS OF STUDY IN HISTOLOGY	2,00	4,00



## References

1. Alberts, B. INTRODUCTION TO CELL BIOLOGY. 5th Ed. Panamericana 2021.
2. Anthony J.F. Giffits MODERN GENETICS. Mc Hill. Inter-American, 2003.
3. Cambell and Reece BIOLOGY. 7th Ed. Panamericana 2007.
4. Cooper GM and Hausman RE. THE CELL. 8th Ed. Marbá, 2021.
5. Haevey, L. CELLULAR AND MOLECULAR BIOLOGY. 5th Ed. Panamericana, 2005.
6. Junqueira, L.C., Carneiro, J. BASIC HISTOLOGY 6th Ed. Masson, 2005.
7. Karp, G. CELLULAR AND MOLECULAR BIOLOGY. CONCEPTS AND EXPERIMENTS. 5th Ed. McGraw-Hill Interamericana, 2009.
8. Künkel, W. ATLAS COLOR OF CYTOLOGY AND HISTOLOGY 11th Ed. Panamericana, 2005.
9. Lodish H., Berk A., Matsudaira P., Kaiser CA., Krieger M., Scott MP., Zipursky L., Darnell J. MOLECULAR CELL BIOLOGY. (7th edition) WH Freeman, 2012.
10. Martín-Lacave, IM. And V. San Martín. PRACTICAL ATLAS OF HISTOLOGY 2nd Ed. Díaz de Santos 2005.
11. Ross, M. H., Pawlina, W. HISTOLOGY: TEXT AND COLOR ATLAS WITH CELLULAR AND MOLECULAR BIOLOGY 6th Ed. Pan American Medical, 2012.



## Addendum to the Course Guide of the Subject

Due to the exceptional situation caused by the health crisis of the COVID-19 and taking into account the security measures related to the development of the educational activity in the Higher Education Institution teaching area, the following changes have been made in the guide of the subject to ensure that Students achieve their learning outcomes of the Subject.

**Situation 1: Teaching without limited capacity** (when the number of enrolled students is lower than the allowed capacity in classroom, according to the security measures taken).

In this case, no changes are made in the guide of the subject.

**Situation 2: Teaching with limited capacity** (when the number of enrolled students is higher than the allowed capacity in classroom, according to the security measures taken).

In this case, the following changes are made:

### 1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject will be made through a simultaneous teaching method combining onsite teaching in the classroom and synchronous online teaching. Students will be able to attend classes onsite or to attend them online through the telematic tools provided by the university (videoconferences). In any case, students who attend classes onsite and who attend them by videoconference will rotate periodically.

In the particular case of this subject, these videoconferences will be made through:

☒ Microsoft Teams

☐ Kaltura



## **Situation 3: Confinement due to a new State of Alarm.**

In this case, the following changes are made:

### **1. Educational Activities of Onsite Work:**

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject, as well as the group and personalized tutoring, will be done with the telematic tools provided by the University, through:

☒ Microsoft Teams

☐ Kaltura

Explanation about the practical sessions:

The practical sessions will be carried out virtually using Microsoft Teams.



## 2. System for Assessing the Acquisition of the competences and Assessment System

### ONSITE WORK

#### Regarding the Assessment Tools:

☒ The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus.

☐ The following changes will be made to adapt the subject's assessment to the online teaching.

Course guide		Adaptation	
Assessment tool	Allocated percentage	Description of the suggested changes	Platform to be used

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

#### Comments to the Assessment System: