1. BASIC INFORMATION

Course	Cell & Tissue Biology
Degree program	Physiotherapy Degree
School	Sports Sciences and Physiotherapy
Year	1st
ECTS	6
Credit type	Basic
Language(s)	Spanish, French, English
Delivery mode	Campus-based
Semester	1st
Academic year	2024-2025
Coordinating professor	Catalina Santiago Dorrego
Professor	Silvia de Vidania Ballesteros

2. PRESENTATION

The overall goal of this course is to provide graduates with knowledge about the fundamentals of cell biology and human tissues. The academic content is divided into 2 modules: module 1 is designed to show the structure and function of cellular components in a hierarchy-wise manner, as well as the main events of cell division. Once acquainted with cell basics, module 2 will guide the students through morphology and ultrastructure details of basic human tissues.

3. COMPETENCIES AND LEARNING OUTCOMES

Core competencies (CB):

- CB1: That students have shown to possess and understand knowledge in an area of study that starts from the base of general secondary education, and is usually found at a level, which, although supported by advanced textbooks, also includes some aspects that imply knowledge coming from the forefront of their field of study.
- CB2: That students know how to apply their knowledge to their work or vocation in a professional way and possess the skills that are usually demonstrated through the elaboration and defence of arguments and problem solving within their area of study.
- CB4: That students can transmit information, ideas, problems, and solutions to both specialized and non-specialized audiences.
- CB5: That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy

Cross-curricular competencias (CT) :

- CT3: Ability of organization and planning
- CT4: Ability of analysis and synthesis
- CT13: Critical thinking
- CT19: Autonomous learning

Specific competencias (CE):

- CE62. To know and understand the normal structure of cells and the different ways they can associate to form tissues
- CE63. To know and understand the mechanisms of cell division and how they are used for tissue renewal and repare.
- CE64. To know and understand the normal function of cells and tissues throughout the different life stages.
- CE65. To know and understand the impact that structure and function alterations may have on a person's state of health.
- CE66. To recognize the main structure and function differences among the different types of tissues.
- CE67. To know and understand how tissues associate to form organs and systems.
- CE68. To know and understand the concept "regenerative medicine", as well as to recognize its worth in the field of physiotherapy.
- CE69. To describe and explain the components and function of the optic microscope.
- CE70. To have the ability to prepare simple microscope specimens.
- CE71. To have the ability to use an optic microscope correctly.
- CE72. To be able to recognize different types of cells and tissues by means of optic microscope observation.
- CE73. To have the ability to tell the differences between electronic and optic microscopy images.
- CE74. To have the ability to synthesize relevant information from simple scientific papers.

Learning outcomes (LO):

- LO1: To understad fundamental concepts related to the contents of the subject.
- LO2: To know the cell structure and composition
- LO3: To tell the differences among human tissues
- LO4: To use an optic microscope
- LO5: To recognize different cell types and tissue by means of optic microscopy.
- LO6: To understand and synthesize course-related scientific literature

The following table shows the relationship between the competencies developed during the course and the learning outcomes pursued:

Competencies	Learning outcomes
CB1, CB2, CB4, CB5, CT3, CT19, CE62, CE70, CE71	**LO1**: To understad fundamental concepts related to the contents of the subject.
CB1, CB2, CT3, CT4, CT13, CE62, CE63, CE64, CE65, CE68	**LO2**: To know the cell structure and composition
CB1, CB2, CB5, CT3, CT4, CT13, CT19, CE62, CE63, CE64, CE65, CE66, CE67, CE68	**LO3**: To tell the differences among human tissues
CB1, CB2, CT3, CT4, CE69, CE70	**LO4**: To use an optic microscope
CB1, CB2, CB5, CT3, CT4, CT13, CT19, CE66, CE72, CE73	**LO5**: To recognize different cell types and tissue by means of optic microscopy.

4. CONTENT

The academic content is divided into 2 modules:

MODULE I: CELL BIOLOGY
- Unit C1. Evolution and cell organization
- Unit C2. Cell membrane
- Unit C3. Cytoskeleton
- Unit C4. Mitochondria
- Unit C5. Endomembrane system
- Unit C6. Nucleus
- Unit C7. Ribosomes
- Unit C8. Cell division: mitosis
- Unit C9. Gametes formation: meiosis

MODULE II: TISSUE BIOLOGY
- Unit H1. Introduction to histology
- Unit H2. Epithelial tissue
- Unit H3. Connective tissue
- Unit H4. Adipose tissue
- Unit H5. Cartilage
- Unit H6. Osseous tissue
- Unit H7. Blood
- Unit H8. Muscle tissue
- Unit H9. Nervous tissue

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:
- Master classes
- Self-learning
- Practical cases
- Virtual seminars
- Laboratory practice
- Tutorships

6. LEARNING ACTIVITIES

Listed below are the types of learning activities and the number of hours the student will spend on each one:

Campus-based mode:

Learning activity	Number of hours
Activity 1: Master classes	30
Activity 2: Self-learning	50
Activity 3: Practical cases	15
Activity 4: Virtual seminars	20
Activity 5: Labooratory practice	25
Activity 6: Tutorships	10
TOTAL	150

7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade.
To pass the course it is mandatory to pass each assessment system separately.

Campus-based mode:

Assessment system	Weight (%)
Theoretical knowledge tests	50
Assessable activities	30
Laboratory practice	20

When you access the course on the *Campus Virtual*, you'll find a description of the assessment activities you have to complete, as well as the delivery deadline and assessment procedure for each one.

7.1. First exam period

To pass the course in the first exam period, the following requirements must be met simultaneously:

- To obtain a grade **of 5 in every assessment system** in order for it to count towards the final grade.
- To obtain **a final course grade of at least 5 out of 10 (weighted average).**

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7.2. Second exam period

If one or more assessment system is failed, students will retake it on the second exam period. Details about how to repeat failed assessment systems will be given on Canvas when necessary.

To pass the course in the second exam period, the following requirements must be met simultaneously:

- To obtain a grade **of 5 in every assessment system** in order for it to count towards the final grade.
- To obtain **a final course grade of at least 5 out of 10 (weighted average).**

8. SCHEDULE

This table shows the delivery deadline for each assessable activity in the course:

Assessable activities	Deadline
Laboratory practice	Week 5
Laboratory practice	Week 10
Laboratory practice	Week 11
Laboratory practice	Week 13
Assessable activity I. Questionnaires and/or scientific papers study	Week 2, 3, 4, 6, 7, 9, 11, 13
Assessable activity II. Integrated activity	Week 6

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

9. BIBLIOGRAFÍA

The main reference work for this subject is (*):

- ALBERTS B et al, Introducción a la biología celular, 3ª ed, Editorial Panamericana, 2012.
- ALBERTS B et al, Biología Molecular de la Célula, 5ª ed, Editorial Omega, 2010.
- CALVO A, Biología Celular Biomédica, 1ª ed, Editorial Elsevier, 2015.
- COOPER GM, La célula, 6ª ed, Editorial Marbán, 2014.
- LODISH H et al, Biología celular y molecular, 5ª ed, Editorial Medica Panamericana, 2011.
- JUNQUEIRA LC y CARNEIRO J, Histología Básica, 12ª ed, Editorial Medica Panamericana, 2015.
- KIERSZENBAUM AL y TRES LL, Histología y Biología Celular: Introducción a la anatomía patológica, 3ª ed, Editorial Elsevier Saunders, 2012.
- ROSS MH y PAWLINA W, Histología: texto y altas color con biología celular y molecular, 6ª ed, Editorial médica Panamericana, 2012.
- WHEATER PR et al, Weater's Histología Funcional: Texto y altas en color, 6ª ed, Editorial Elsevier, 2014.

- ROSS MH et al, Atlas de Histología Descriptiva, 1ª ed, Editorial Médica Panamericana, 2012.
- BOYA J, Atlas de Histología y Organografía microscópica, 3ª ed, Editorial Médica Panamericana, 2011.
- GARTNER LP y HIATT JL, Atlas en color de Histología, 5ª ed, Editorial Médica Panamericana, 2011.
- KÜHNEL W, Atlas de color de Citología e Histología, 11ª edición, Editorial Médica Panamericana, 2010.

(*) Most of the books listed above can also be found in English or French at the Library of Universidad Europea de Madrid

10. EDUCATIONAL ORIENTATION AND DIVERSITY UNIT

From the Educational Orientation and Diversity Unit (ODI) we offer support to our students throughout their university life to help them reach their academic achievements. Other pillars of our action are the inclusion of students with specific educational support needs, universal accessibility on the different campuses of the university and equalization of opportunities.
From this Unit, students are offered:

1. Accompaniment and follow-up by carrying out counseling and personalized plans for students who need to improve their academic performance.
2. In terms of attention to diversity, non-significant curricular adjustments are made, that is, at the level of methodology and evaluation, in those students with specific needs for educational support, thereby pursuing equal opportunities for all students.
3. We offer students different extracurricular training resources to develop various skills that will enrich their personal and professional development.
4. Vocational guidance by providing tools and advice to students with vocational doubts or who believe they have made a mistake in choosing the degree.

Students who need educational support can write to us at: orientacioneducativa@universidadeuropea.es

11. ONLINE SURVEYS

Your opinion matters!

The Universidad Europea encourages you to participate in several surveys which help identify the strengths and areas we need to improve regarding professors, degree programs and the teaching-learning process.

The surveys will be made available in the “surveys” section in virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.