1. BASIC INFORMATION

Course	Structure and function of the human body: Systems II
Degree program	Physiotherapy 100% English
School	Medicine, Health and Sports
Year	1st
ECTS	6
Credit type	Basic
Language(s)	Spanish, French and English
Delivery mode	Campus-based
Semester	S2
Academic year	2024-2025
Coordinating professor	Elena Velarde Fernández and Iciar Gárate Pérez

2. PRESENTATION

The aim of this subject is to provide students with the knowledge to understand the functions of the human body and acquire a complete and inclusive body concept. It widens the horizon to comprehend the response of the human body to the performance of physical activities and sports. It also helps understanding other subjects included in the present degree program. It provides the necessary foundation of physiological and anatomical concepts for the future physiotherapist, and stablishes the basis for critical and scientific thinking.

3. LEARNING OUTCOMES

Knowledge:

CON3. Identify the various structures of organs and systems of the human body, as well as their function.

CON6. Learn about and understand the morphology, physiology, pathology and behaviour of both healthy and unwell people in their natural and social environment.

CON7. Learn about and understand the science, models, techniques and tools on which physiotherapy is based, structured and carried out.

CON8. Learn about the physiological and structural changes that may occur as a consequence of physiotherapy.

- Identify, in various formats, the main anatomical structures of the systems studied on the course.
- Study homeostatic regulation in relation to each system studied on the course, both at rest and during physical activity.

- Recognise the relationships between the structures and how they function for each of the systems studied on the course.
- Describe the responses and adaptations made by the relevant systems during exercise and fitness training.
- Determine the metabolic mechanisms that provide energy to the body during exercise, and the importance of nutrition.
- Identify the main parameters linked to the functional capacity of an individual in order to prescribe appropriate exercise guidelines

Abilities:

HAB5. Use the scientific and technical language specific to Health Sciences.

- Correctly use the terminology specific to human anatomy and physiology.
- Analyse what happens during the process of skeletal muscle contraction and relaxation.

Skills:

COMP25. Use information and communication technologies to search for and analyze data, research, communicate and learn.

COMP27. Cooperate with others in shared academic or professional goals, participating actively, empathically and exercising active listening and respect for all members.

COMP30. Show ethical behavior and social commitment in performance of professional activities, as well as sensitivity to inequality and diversity.

4. CONTENT

The subject is organized in five learning units, each of them with different topics.

Unit 1. Respiratory system
1.1. Introduction: structure and functions.
1.2. Superior and inferior airways.
1.3. Ventilatory mechanics.
1.4. Gas exchange.
1.5. Nervous regulation.

Unit 2. Cardiovascular system
2.1. Anatomy of the heart and blood vessels.
2.2. Heart roles.
2.3. Electrical cardiac events. Electrocardiogram.
2.4. Mechanical cardiac events. Cardiac cycle.
2.5. Regulation of vascular circulation.
2.6. Nervous control of the cardiovascular function.

Unit 3. Introduction to exercise physiology.
3.1. Exercise as a disruptor of homeostasis: demands and requirements
3.2. Responses vs adaptations
3.3. Main responses and adaptations of skeletal muscle.

3.4. Main responses and adaptations of hormones.
3.5. Exercise and respiratory system.
3.6. Cardiovascular responses and adaptations to exercise.
3.7. Reference parameters in exercise.

Unit 4. Digestive system and energy sources during physical activity.
4.1. General functions.
4.2. Anatomy of the digestive tract.
4.3. Digestive physiology.
4.4. Intake regulation.
4.5. Energy sources during physical activity.
4.6. Intensity definition according to VO2max.
4.7. Exercise prescription.

Unit 5. Urinary system
5.1. Anatomy of the urinary system.
5.2. Ultrastructure of the kidney: the nephron.
5.3. Urine formation.
5.4. Regulation of urine formation.
5.5. Urine excretion: urination.

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- Master classes
- Case-based learning
- Cooperative learning
- Learning based on workshop teaching
- Simulation environments

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
Master classes	25
Practical application seminars	5
Analysis and resolution of cases	16
Preparation of reports and writtings	14
Activities in workshops and/or laboratories	12
Self learning	56

Debates and colloquia	8
Tutorships	12
In-person evaluation tests	2
TOTAL	**150 h**

7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade:

7.1. First-exam period.

Assessment system	Weight
In-person evaluation tests	55%
Reports and writtings	20%
Case/problem	10%
Laboratory workbook	15%

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.

To pass the subject in the ordinary session it is mandatory to obtain **at least a 5.0 in each of the mentioned blocks to average with the other** blocks of the subject. In the case of the tests of knowledge, it will always be necessary to obtain a 5.0 in each of them to average with the rest

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7.2. Second-exam period

To pass the subject in the extraordinary call (July), all the requirements set out above for the ordinary call must be met, that is, it will be necessary to obtain a **minimum grade of 5 in each pending block** to be able to average with the other blocks of the subject.

8. SCHEDULE

On the virtual campus you will have a document that includes the dates of completion and delivery of the evaluable activities of the subject.

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. BIBLIOGRAPHY

The recommended bibliography is:

- Fox, S.I. Human physiology. McGraw-Hill, 2010.
- Katch, McArdle y Katch. Exercise physiology: nutrition, energy and human performance. Lippincott Williams and Wilkins. 2010.
- Netter, F.H. *Atlas of human anatomy: a regional approach with Latin terminology.* (8th ed.) Amsterdam, Elsevier, 2022.
- Patton, K.T. and Thibodeau G.A. *Structure and function of the body* (16th ed.) Missouri Elsevier, 2020.
- Silverthorn, D.U. *Human Physiology: an integrated approach*. (8th ed.) Pearson, 2019.
- Sobotta, J. *Atlas of human anatomy: volume II* (15th ed). Munchen Elsevier, 2013.
- Tortora, J., Derrickson, B. *Principles of anatomy and physiology: international adaptation* (16th ed.). Hoboken, New Jersey Wiley, 2023.

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.