

## 26760 - Physiology I

### Syllabus Information

**Academic Year:** 2019/20

**Subject:** 26760 - Physiology I

**Faculty / School:** 104 - Facultad de Medicina

229 - Facultad de Ciencias de la Salud y del Deporte

**Degree:** 304 - Degree in Medicine

305 - Degree in Medicine

**ECTS:** 6.0

**Year:** 1

**Semester:** First semester

**Subject Type:** Basic Education

**Module:** ---

## 1.General information

### 1.1.Aims of the course

### 1.2.Context and importance of this course in the degree

### 1.3.Recommendations to take this course

## 2.Learning goals

### 2.1.Competences

### 2.2.Learning goals

### 2.3.Importance of learning goals

## 3.Assessment (1st and 2nd call)

### 3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

## 4.Methodology, learning tasks, syllabus and resources

### 4.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. It favors the acquisition of knowledge related to Physiology. A wide range of teaching and learning tasks are implemented, such as lectures, practice sessions, and assignments.

Students are expected to participate actively in the class throughout the semester.

Classroom materials will be available via Moodle. These include a repository of the lecture notes used in class, the course syllabus, as well as other course-specific learning materials.

Further information regarding the course will be provided on the first day of class.

### 4.2.Learning tasks

The course includes 6 ECTS organized according to:

- Lectures (1,6 ECTS): 40 hours.
- Practice sessions (0,64 ECTS): 16 hours.
- Assignments (0,32 ECTS): 8 hours.
- Assessment (0,2 ECTS): 5 hours.

- Autonomous work (3,24 ECTS): 81 hours.

### 4.3.Syllabus

The course will address the following topics:

- 1. Concepts of Physiology and Biophysics. The central role of Physiology in Medicine.
- 2. Homeostasis. Control mechanisms. Biorhythms.
- 3. Free radicals. Its features and functions. Antioxidants mechanisms. Oxidative stress in tissues.
- 4. Transport through biological membranes.
- 5. Bioelectric potentials. Ionic basis. The genesis of the action potential.
- 6. Action potential conduction.
- 7. Transmission of the action potential.
- 8. Neurotransmitters and their receptors.
- 9. Neurotransmitters in the autonomic nervous system.
- 10. Biological fluids. Compartments: volume and composition.
- 11. The pH of biological fluids.
- 12. Hormonal action mechanisms.
- 13. Basic principles of bioenergetics: Work. Energy efficiency.
- 14. Physiological basis of human nutrition.
- 15. Normal dietary requirements and special situations.
- 16. Biophysics and physiology of skeletal muscle.
- 17. Smooth muscle physiology.
- 18. Physiology of the heart muscle.
- 19. Post-embryonic stem cells. Classification. Growth factors and differentiation.
- 20. Tissue Physiology: Physiology of endothelium.

Practical program (Faculty of Medicine)

1. Strategies and learning styles in Physiology (seminar).
2. Study of a cell function (laboratory).
3. Physiological aging (seminar).
4. Transport and cellular permeability (simulation).
5. Bioelectrical potentials (simulation).
6. Transmission of action potential (ABP).
7. Assessment of nutritional status (laboratory).
8. Practical calculation of nutritional needs (laboratory).
9. Elaboration of a diet (laboratory).
10. Muscle metabolism (ABP).
11. Muscle contraction (simulation).

Practical program (Faculty of Health and Sport Sciences)

1. Osmosis.
2. Valued solutions.
3. Transmission of the action potential. Potential simulation.
4. Conceptual map.
5. Muscle metabolism.
6. Practical calculation of nutritional needs.
7. Elaboration of a diet.
8. Muscle contraction (ABP).
9. The functional problem of the maintenance of the electrolyte balance.

### 4.4.Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class or please refer to the "Facultad de Medicina" website and the Degree website <http://medicina.unizar.es/primer-curso>

Huesca Degree website: <https://fccsyd.unizar.es/horarios-y-calendarios-medicina>

#### **4.5. Bibliography and recommended resources**

<http://psfunizar7.unizar.es/br13/eBuscar.php?tipo=a>