

29301 - Human General Physiology

Syllabus Information

Academic Year: 2020/21

Subject: 29301 - Human General Physiology

Faculty / School: 229 - Facultad de Ciencias de la Salud y del Deporte

Degree: 442 - Degree in Odontology

ECTS: 6.0

Year: 1

Semester: Second 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 the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, laboratory sessions, tutorials and autonomous work and study.

4.2.Learning tasks

Due to the exceptional situation of the course 2020-2021, the learning activities will depend on the availability of faculty spaces. The learning program will be scheduled as follows:

- **Lectures** (1.6 ECTS - 40 hours). Classes would be followed *on line*, through Google Meet software. Basic concepts of the course are showed, directing students towards the acquisition of skills and learning outcomes. Audiovisual support material will be used and students could find it in Moodle. During these activities, students will be encouraged to be participatory and dynamic.
- **Laboratory sessions** (0.4 ECTS - 10 hours). These sessions will take place at the laboratory

in small groups. Students will have the opportunity to perform functional examinations of the main physiological parameters on animal or human samples. All students will be informed about the risks that may involve the realization of the practices of this course, will be informed about how to handle dangerous products, and what to do in case of accident. To perform them is compulsory to sign a commitment to comply with lab standards and safety. It is the student's responsibility to be aware of all such issues and act in an extremely cautious manner to avoid any accident in the laboratory. For more information, check the information for students of the Occupational Health and Safety Unit: <http://uprl.unizar.es/estudiantes.html>. Before each session, the protocol of the practice will be available for students. At the end of it, students submit to the teacher a laboratory assignment with answers to questions about the practice performed and the results obtained. Along with the degree of participation and teamwork done, this assignment will grade this part of the course.

- **Physiology cases** (0.2 ECTS - 5 hours): These sessions will be attended at class in small groups. The student should solve problems about cases of alteration or adaptation of function, in order to integrate and apply his theoretical knowledge.
- **Autonomous work and personal study** (3.5 ECTS - 89 hours): From all other activities, students should be responsible for creating diagrams and structured work programs.
- **Exams** (0.24 ECTS - 6 hours).
- **Tutorials:** Professors' office hours can be used to solve doubts and to follow-up students' work.

4.3.Syllabus

This course will address the following topics:

General Physiology

1. The concept of Physiology. Levels of organization. Cell.
2. Organic fluids. Homeostasis. Mechanisms of regulation.
3. Membrane transport.
4. Physiology of excitable tissues: Neurons y Muscle. Membrane potential. Action potential.
5. Methods of conduction. Nervous system. Synapses.

Physiology of the nervous system

1. Functional organizations of the nervous system
2. Sensitive functions: Sensory receptors. Receptors classification. Hearing sensitivity. The vestibular system. Photoreception.
3. Motor system. Neuromuscular junction. Motor control. Reflexes.
4. Autonomic nervous system.

Physiology of contraction

1. Types of muscle. Structure and function of skeletal muscle fiber.

Blood Physiology

1. The general functions of blood. Components of plasma.
2. Erythrocytes: Characteristics and functions.
3. Leukocytes: Characteristics and functions.
4. Hemostasis: coagulation. Fibrinolysis. Anticoagulants.

Endocrine System Physiology

1. Characteristics of the endocrine system.

2. Hypothalamic-pituitary axis.
3. Thyroid hormones.
4. Hormones of the adrenal gland.
5. Hormones of the endocrine pancreas.
6. Phosphocalcic Metabolism.

Cardiovascular Physiology

1. General functions of the cardiovascular system. Hemodynamics.
2. Electrical and mechanical activity of the heart.
3. Regulation of cardiac activity.
4. Arterial circulation and arterial pressure. Regional blood circulation.
5. Microcirculation. Venous and lymphatic return.

Respiratory Physiology

1. General functions of the respiratory system. Functions of the upper airways. Mechanics of respiration. Pulmonary and bronchial circulation.
2. Respiratory membrane. Transport of gases. Regulation of respiration.
3. Regulation of breathing.

Renal Physiology

1. Structure and functions of urinary system. Filtration, reabsorption, secretion and excretion.
2. Hydroelectric equilibrium. Regulation of acid-base balance
3. Miction

Digestive Physiology

1. Structure and functions of digestive system.
2. Oral cavity functions. Functions of the esophagus. Functions of the stomach.
3. Physiological functions of the liver. Liver and gallbladder digestive functions. Functions of the pancreas exocrine. Small and large intestine functions.

LABORATORY SESSIONS: The practical program of the subject is divided into the following practical laboratory sessions and/or seminars

1. Physiology laboratory and functional tests. Laboratory safety, biological hazards, waste control, quality control.
2. Exploration of the nervous system: sensitivity, special senses, Reflexes.
3. Exploration of the blood system: Hematocrit, leukocyte formula, and sanguineous groups.
4. Exploration of the hormonal system: glycemic curve.
5. Exploration of the cardiovascular system: normal electrocardiogram (Simulation). Blood pressure and pulse.
6. Exploration of the respiratory and renal system: spirometry (Simulation) and urinalysis.

PROBLEM SESSIONS:

1. Problem Based Learning (PBL): General / Nervous /Blood
2. Problem Based Learning (PBL): Endocrine.
3. Problem-Based Learning (PBL): Cardiovascular / Renal / Respiratory.

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 Faculty of Health and Sport Sciences website and Moodle.

<https://fccsyd.unizar.es/academico/horarios-y-calendarios>

4.5. Bibliography and recommended resources