Universidad Zaragoza

Year : 2019/20

29201 - Human Physiology

Syllabus Information

Academic Year: 2019/20
Subject: 29201 - Human Physiology
Faculty / School: 229 - Facultad de Ciencias de la Salud y del Deporte
Degree: 441 - Degree in Human Nutrition and Dietetics
ECTS: 9.0
Year: 1
Semester: Annual
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

This course is organized as follows:

- **Lectures** (60 hours) in which the fundamental concepts of each topic will be presented, so that allow students to study independently. 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 learning resources
- **Laboratory sessions** (30 hours). Problem-solving sessions that take 1 to 3 hours. They what is learned in the lectures, usually by performing functional tests that require to collect and analyze results.
    - All students will be informed about the risks that may have the realization of the practices of this course, and whether hazardous materials are handled and what to do in case of accident, and they must sign a commitment to comply with labor standards and safety to perform them. For more information, see the information for students Unit Occupational Health and Safety: http://uprl.unizar.es/estudiantes.html.
- **Autonomous work and study**: Students do tasks such as self-assessment questionnaires or gamification

activities to improve motivation in learning.

- **Group work:** Groups of 4-5 students work autonomously directed by the teacher. Students will review a topic, article or case related to Physiology and must submit a report of the work done.
- **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:

Lectures:

Section 1. General physiology

- Physiology Concept.Homeostasis.Characterization of body fluids.
- Transport through the cell membrane.
- Membrane potential. Action potential.
- Principles of intercellular communication. Cell signaling
- Neuronal physiology: Synapse.
- Physiology of muscle.

Section 2. Neurophysiology

- The organization and function of the nervous system.
- Somatic and special senses
- Motor Nervous System
- Autonomic nervous system. Sympathetic and parasympathetic system.

Section 3. Physiology of blood

- General characteristics and functions of blood. Plasma components
- Characteristics and functions of erythrocytes. Iron Metabolism. Sanguineous groups
- Types and functions of leukocytes. Immunity
- Hemostatic mechanisms. Platelets. Coagulation. Fibrinolysis

Section 4. Digestive physiology

- Structure and functions of the digestive system. Enteric nervous system.
- Food intake, chewing and salivary secretion. Swallowing.
- Stomach. Gastric secretion and regulation of gastric motility
- Exocrine functions of the pancreas. Regulation of pancreatic secretion.
- Function of the liver and gallbladder
- Small intestine. Intestinal motility. Absorption of digestion products in the small intestine.
- Large intestine. Motility and defecation.

Section 5. Renal physiology

- Structure and functions of the renal system. Glomerular filtration.Renal clearance. Renal hemodynamics.
- Tubular function: reabsorption and secretion. Concentration and dilution of urine.
- Regulation of volume and osmolarity of body fluids. Acid-base balance.

Section 6. Cardiovascular physiology

- Structure and functions of the cardiovascular system.Physiology of the heart. Cardiac Electrophysiology.
- Mechanical activity of the heart. Cardiac cycle.
- Physiology of blood vessels. Systemic capillary and lymphatic circulation.
- Control of cardiac activity and peripheral circulation. Blood pressure.

Section 7. Respiratory physiology

- Structure and functions of the respiratory system.Respiration: Pulmonary ventilation. Mechanics of breathing.
- Gas exchange in the lungs and tissues. Transportation of respiratory gases.
- Regulation of breathing. Nervous and chemical control.

Section 8. Endocrine physiology and other

- General characteristics of the endocrine system. Mechanisms of hormonal action.
- Hypothalamic and pituitary hormones.
- The adrenal gland. Steroid hormones and catecholamines.

- Thyroid hormones.
- Hormones of calcium metabolism and phosphorus.
- Pancreatic hormones. Glycemic control
- Pineal gland or epiphysis. Melatonin.
- Hormones of adipose tissue
- Control of intake: hunger-satiety
- Energy metabolism
- Control of body temperature.

Laboratory sessions:

- Physiology laboratory and functional tests. Laboratory safety, biological hazards, waste control, quality control.
- Exploration of the nervous system I: sensitivity
- Exploration of the nervous system II: special senses.
- Exploration of the nervous system III: Reflexes
- Problem Based Learning (PBL) General / Nervous
- Exploration of the renal system. Urinalysis . Osmolarity, concentration-dilution.
- Exploration of the digestive system: Enzymes.
- Problem Based Learning (PBL) Renal / Digestive
- Exploration of the blood system: Hematocrit, leukocyte formula and sanguineous groups.
- Exploration of the cardiovascular system: normal electrocardiogram and cardiac auscultation. Blood pressure and pulse.
- Problem-Based Learning: Blood / Cardiovascular
- Exploration of the respiratory system: spirometry.
- Exploration of the respiratory system: pH regulation
- Hormonal examination: blood glucose curve.
- Problem-based learning: Respiratory / Endocrine.
- Theoretical and practical seminar. Physiology of reproduction

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.

4.5.Bibliography and recommended resources

http://psfunizar7.unizar.es/br13/egAsignaturas.php?codigo=29201