

29201 - Human Physiology

Información del Plan Docente

Academic Year	2017/18
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.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

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

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The subject has a basic orientation so that the activities proposed are oriented towards understanding and assimilation of the main concepts of physiology and knowledge of the function and regulation of the various systems of the human body. Students are expected to participate actively in the class throughout the semester.

5.2.Learning tasks

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Participative lectures, in which the fundamental concepts of each topic will be presented, so that allow students to study independently

Practice sessions : It support what is learned in the theory classes, usually by performing functional tests that required to collect and analyze results. The sessions take one to three hours.

All students will be informed about the risks that may have the realization of the practices of this subject, 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>.

Problem-based learning: It serves to encourage discussion and practical application of the concepts discussed in lectures

Autonomous work : Students do tasks such as self-assessment questionnaires or gamification activities to improve motivation in learning.

Tutorial : Professors' office hours can be used to solved doubts and to follow-up students' work.

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

5.3.Syllabus

The course will address the following topics:

Participative Lectures (60h) The theoretical program is divided in eight modules, with the following topics

General physiology

- * Physiology Concept: Objectives and interest. Relationship with other sciences. Physiology in Nutritional studies
- * Homeostasis. Transport through the cell membrane.
 - Membrane potential. Action potential.
- * Neuronal physiology: Synapse.
- * Physiology of skeletal muscle. Excitation-contraction coupling

Neurophysiology

- * Introduction to the physiology of the nervous system.
- * Sensory Receptors

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- Motor Nervous System

* Autonomic nervous system. Sympathetic and parasympathetic system.

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

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.

Renal physiology

* 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.

Cardiovascular physiology

* Physiology of the heart. Cardiac Electrophysiology.

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- * 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.

Respiratory physiology

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

Endocrine physiology and other

- * General characteristics of the endocrine system. Mechanisms of hormonal action.
- * Hypothalamic and pituitary hormones.
- * Thyroid hormones.
- * Hormones of calcium metabolism and phosphorus.
- * Pancreatic hormones. Glycemic control
- * The adrenal gland. Steroid hormones and catecholamines.
- * Pineal gland or epiphysis. Melatonin.
- * Control of body temperature.
- * Hormones of adipose tissue
- * Control of intake: hunger-satiety
- * Energy metabolism

Lab practices:

The practical program of subject (32h) is divided into the following sessions throughout the course:

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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 I: osmolarity, concentration-dilution.

Exploration of the renal system. Urinalysis II: urinary sediment.

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 I: normal electrocardiogram and cardiac auscultation.

Exploration cardiovascular system II: Blood pressure and pulse.

Problem-Based Learning: Blood / Cardiovascular

Exploration of the respiratory system: spirometry.

Hormonal examination: blood glucose curve.

Problem-based learning: Respiratory / Endocrine.

5.4.Course planning and calendar

Further details concerning the calendar and information regarding this course will be provided on the first day of class.

5.5.Bibliography and recommended resources