

29301 - Human General Physiology

Información del Plan Docente

Academic Year	2016/17
Academic center	229 - Facultad de Ciencias de la Salud y del Deporte
Degree	442 - Degree in Odontology
ECTS	6.0
Course	1
Period	Second semester
Subject Type	Basic Education
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The learning process designed for this course follows an orderly step-wise process, so that the course starts with the study of basic and integration concepts which are mainly worked through **lectures** , then it introduces the student to develop skills involving procedural, integration and understanding skills of the applications of the subject to be worked through various activities in small groups in **practical sessions** .

To better track the learning process students will be encouraged to use the **tutoring/office hours** through various

29301 - Human General Physiology

systems and methods: conventional tutoring or more specific assistance related to practical work.

Communications, announcements, and supplementary materials will be provided via Moodle in the **Anillo Digital Docente** (intranet ADD).

5.2.Learning activities

Participatory lectures : basic concepts of the subject are showed, directing students towards the acquisition of skills and learning outcomes. Audiovisual support material will be used and students could find it in the intranet ADD. During these activities, students will be encouraged to be participatory and dynamic. This activity occupies 4 ECTS, 40 hours in the lecture room.

Practical sessions occupying 2 ECTS, 20 hours spread over six sessions of 2 hours including:

a) Laboratory sessions: 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 have the realization of the practices of this subject, and if dangerous products are handled, 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 potential causes for accidents in the laboratory. For more information, see the information for students of the Occupational Health and Safety Unit: <http://uprl.unizar.es/estudiantes.html>

b) Physiology cases: the student should solve problems about cases of alteration or adaptation of function, in order to integrate and apply his theoretical knowledge.

c) Computer simulations: analysing physiological parameters under simulation and different experimental conditions, the student is able to understand how the different systems and organs are integrated and regulated.

Before each session, students will have available the protocol of the practice. 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.

Tutorials: both individual and grouped, for guidance in the teaching-learning of the subject.

Personal Study: From all other activities, students should be responsible for creating diagrams and structured work programs.

29301 - Human General Physiology

5.3.Program

LECTURE TOPICS:

I. General Physiology

- 1- The concept of Physiology. Homeostasis. Internal environment and body fluids.
- 2.- Organic fluids: Body compartment volumes and composition. osmosis and osmotic pressure.
- 3.- Membrane transport.
- 4.- Physiology of excitable tissues. Membrane potential. Action potential. Conduction and transmission of nerve impulses. Synapses.
- 5.- Skeletal muscle contraction.
- 6.- General mechanisms of the endocrine system.
- 7.- Regulation of the vegetative functions. The autonomic nervous system.

II. Blood Physiology

- 8.- The general functions of blood. Components: Plasma and blood cells. Hematopoiesis.
- 9.- Erythrocytes: Characteristics and functions. Iron metabolism.
- 10- Physiological hemostasis. Coagulation. Fibrinolysis. Anticoagulants.
- 11.- Immunity

III. Cardiovascular Physiology

- 12- General functions of the cardiovascular system
- 13- Electrical and mechanical activity of the heart. Regulation of cardiac activity
- 14- Arterial circulation and arterial pressure.

29301 - Human General Physiology

15- Microcirculation. Venous and lymphatic return.

16- Endothelial function. Blood flow regulation. Regional blood circulation

IV. Respiratory Physiology

17.- General functions of the respiratory system. Functions of the upper airways. Mechanics of respiration.

18.- Respiratory membrane. Transport of gases. Regulation of respiration.

V. Renal Physiology

19.- Functions of the kidneys and urinary system. Micturition.

20.- Ultrafiltration and tubular function. Renal clearance.

21.- Renal regulation of the volume and composition of extracellular fluid. Mechanisms of concentration and dilution of urine.

22.- Sodium, Chloride and potassium homeostasis. Renin-Angiotensin-aldosterone system.

23.- Regulation of acid-base balance.

VIII. Digestive Physiology

24.- Introduction to digestive processes: motility, secretion, absorption and regulation

25.- Oral cavity functions. Functions of esophagus. Functions of the stomach.

26.- Functions of the pancreas exocrine. Liver and gallbladder digestive functions.

27.- Small and large intestine functions. Defecation.

28.- Other physiological functions of the liver.

IX. Endocrine system Physiology

29301 - Human General Physiology

29.- Hypothalamic-pituitary axis.

30.- Thyroid hormones.

31.- Hormones of the adrenal gland.

32.- Endocrine function of gonads. General characteristics of the reproductive function. Pregnancy, parturition and lactation

33.- Hormones of the endocrine pancreas.

X. Physiology of the nervous system

34.- Functional organizations of the nervous system. Sensitive functions: Sensory receptors. Receptors classification.

35.- Sensitive functions: Hearing sensitivity. The vestibular system. Photoreception.

36.- Reflex action: properties and classification of the reflexes. Motor control.

37.- Superior functions of the nervous system. wakefulness and sleep.

X. Integrative Physiology

38.- Body temperature: control and regulation.

5.4.Planning and scheduling

The theoretical lectures will begin the first day of class assigned to the theoretical teaching of the subject. In this first day of class it will also be communicated practices, seminars dates and tutored project deadline, according to the academic calendar. Those dates will be posted on the official Faculty or Departmental notice boards.

5.5.Bibliography and recommended resources

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29301 - Human General Physiology

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- Pocock, Gillian. Fisiología humana : la base de la medicina / Gillian Pocock, Christopher D. Richards . 2ª ed. Barcelona [etc.] : Masson, 2005 (B.C.)
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