

69300 - Fundamentals of Anatomy, Physiology, Pathology and Therapeutics

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	547 - Master's in Biomedical Engineering 330 - Complementos de formación Máster/Doctorado
ECTS	12.0
Course	---
Period	Indeterminate
Subject Type	ENG/Complementos de Formación, Compulsory
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 teaching methodology is structured in three levels: theoretical classes where the main subject contents are presented and discussed; also lab sessions and operating room (OR) sessions and development of practical tasks based on a real application or specific research activity are proposed.

5.2.Learning activities

There will be the following activities:

69300 - Fundamentals of Anatomy, Physiology, Pathology and Therapeutics

A01 Theoretical classes with the active involvement of the student (95 hours). This activity will take place in the classroom in person.

A03 Laboratory sessions (7 hours). Two lab sessions are carried out. They may take place in research labs of I3A or in research labs of Faculty of Veterinary Medicine.

A04 Special practices (8 hours). Will take place in the operating rooms of the Clinical University Lozano Blesa Hospital and Miguel Servet Hospital.

A05 Development of practical tasks . Different activities/tasks are proposed related with the main contents

of the course

A06 Tutorship . Students may solve any questions they might have about unclear contents of the course

A08 Assessment. The student will take an exam and several reports derived from the lab sessions and derived from the development of practical tasks will be evaluated

5.3.Program

Thematic block: Fundamentals of Anatomy and Cell Biology

Theoretical classes:

1. The cell
2. Cellular organelles
3. Mitosis and Meiosis. General Embriology
4. Histology I
5. Histology II
6. Histology III
7. Introduction to Anatomy
8. Anatomy of the Nervous System
9. Anatomy of the Urinary System

69300 - Fundamentals of Anatomy, Physiology, Pathology and Therapeutics

10. Anatomy of the Cardiovascular and respiratory Systems

11. Anatomy of the Digestive System

12. Anatomy of the Musculoskeletal System

13. Reproductive Anatomy

Practical classes:

- Blood smear
- Operation of a pathology diagnosis laboratory
- Histology
- Osteology will be integrated with the lectures)

Thematic block: Fundamentals of Physiology

Theoretical classes:

- 1- The concept of Physiology.
- 2- Homeostasis. Internal environment and body fluids.
- 3- Transmembrane transport.
- 4- Physiology of excitable tissues. Membrane potential. Action potential. Genesis and conduction.
- 5- Transmission of nerve impulses. Synapses.
- 6- Skeletal muscle physiology.
- 7- Neuromuscular junction. Excitation contraction coupling.
- 8- Functional structure of the nervous system.
- 9- Sensitive functions. Sensory receptors. Receptors classification.
- 10- Regulation of motor activity.

69300 - Fundamentals of Anatomy, Physiology, Pathology and Therapeutics

- 11- Electroencephalography.
- 12- Renal physiology.
- 13- General functions of the cardiovascular system
- 14- Electrical activity of the heart.
- 15- Mechanical activity of the heart.
- 16- Regulation of cardiac activity.
- 17- Arterial pressure. Microcirculation.
- 18- Venous and lymphatic return.
- 19- Mechanics of respiration.
- 20- Respiratory membrane. Transport of gases.
- 21- Digestive physiology.
- 22- General mechanisms of the endocrine system.

Laboratory Sessions:

- Blood types
- The electrocardiogram (EKG)
- Blood pressure.
- Spirometry

Thematic block of Pathology and Therapeutic Basis

Theoretical classes:

1. Concept of health and disease.
2. Pathology. Clinic and diagnosis of diseases: Diseases and syndroms.
3. Bioethics
4. Digestive system: function and pathology

69300 - Fundamentals of Anatomy, Physiology, Pathology and Therapeutics

- 5: Respiratory system: function and pathology
6. Vascular system: function and pathology
7. Musculoskeletal system: Function and Pathology
- 8: Medical (pharmacology), surgical, radiotherapeutic diseases treatment
9. Bases and foundations of Surgery

10. Current surgery in 21st century
- 11: Minimally invasive surgery and perspectives

12: Bioengineering and surgery.

13: M.B.E. and Research in surgery.

Clinical practice in surgical services at University Hospitals

5.4.Planning and scheduling

The course calendar is defined by the Escuela de Ingeniería y Arquitectura calendar.

5.5.Bibliography and recommended resources

- Silverthorn, Dee Unglaub. Fisiología humana : un enfoque integrado / Dee Unglaub Silverthorn ; con la colaboración de Bruce R. Johnson y William C. Ober, coordinador de ilustraciones, Claire W. Garrison, ilustradora, Andrew C. Silverthorn, consultor crítico . - 6ª ed. Buenos Aires ; Madrid [etc.] : Editorial Médica Panamericana, cop. 2014
- Fox, Stuart Ira. Fisiología humana / Stuart Ira Fox . - 13ª ed. México [etc.] : McGraw-Hill Education, cop. 2014
- Sobotta. Atlas de Anatomía humana. Editorial médica panamericana
- Stevens. Histología humana. Editorial Mosby. Año 2006
- Ross, Pawlina y Barnash. Atlas de Histología descriptiva. Editorial médica panamericana
- Guyton, A. C. y Hall, J. E. Tratado de Fisiología Médica (12ª Ed). McGraw Hill-Interamericana, 2011
- Arteaga Martínez, García Peláez. Embriología humana y Biología del desarrollo. Editorial panamericana
- Alberts B, Johnson A, Lewis J, Raff M, Roberts K, Walter P. 2004. *Biología Molecular de la Célula*, 4ª edn. Omega. Barcelona