

26766 - Physiology III

Syllabus Information

Academic year: 2023/24

Subject: 26766 - Physiology III

Faculty / School: 104 - Facultad de Medicina

229 - Facultad de Ciencias de la Salud y del Deporte

Degree: 304 - Degree in Medicine

305 - Degree in Medicine

ECTS: 6.0

Year: 2

Semester: First semester

Subject type: Compulsory

Module:

1. General information

This subject integrates basic knowledge of the functioning of the heart and circulation in all its sections, respiratory functions and the digestive system in its motor, secretory, digestive and absorption processes. The knowledge and skills acquired in Physiology III are based on other of Physiology I and II and will serve as a basis for Physiology IV, Pharmacology, Pathophysiology and all Medical-Surgical Pathologies.

Its approaches are aligned with the Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>), so that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement: Goal 3: Health and wellness. Goal 4: Quality education.

2. Learning results

The student, in order to pass this subject, must demonstrate the following results...

1. List the periods of the cardiac cycle, describing the cardiac volumes and pressures at each period.
2. Analysing normal heart rate values and calculating cardiac output
3. Know the functional basis of the cardiac excitoconduction system.
4. Perform and interpret the physiological ECG.
5. Describe the intrinsic and extrinsic mechanisms involved in cardiac regulation.
6. Know and describe the operation of the circulation in all its sections.
7. Study the central and peripheral regulation mechanisms of the circulation
8. List the mechanisms of blood pressure regulation.
9. Understand the components and forces of microcirculation and apply them to the genesis of oedema
10. List and describe the factors that regulate venous return.
11. Know the particularities of some local circulations: coronary, muscular and splanchnic.
12. Understand the dynamics of pulmonary interstitial fluids and the pressures and resistances in the pulmonary circulation.
13. List functions of the upper and lower airways, pleura and pleural fluid.
14. Understand the concept of pulmonary compartmentalization and its applications in respiratory functional assessment
15. Define the main thoracic pressures involved in respiration and their variations during the respiratory cycle.
16. Analyse the elastic and non-elastic physiological mechanisms involved in respiratory mechanics.
17. Define alveolar ventilation and know its normal values.
18. Describe ventilation-perfusion relationships and their pulmonary topographic variations.
19. Assess the factors affecting gaseous diffusion in the respiratory membrane.
- 20- Know the partial pressures of respiratory gases in the alveoli and in arterial and venous blood.
- 21- Understand the physiological mechanisms involved in the control of respiration.
22. State the actions of innervation in the gastrointestinal tract and relate digestive hormones to their functions.
23. Describe the process of mastication and the swallowing reflex.
24. Study the functions of gastric and intestinal motility.
25. Analyse the composition and functions of salivary secretion.
26. Describe the mechanism and regulation of acid secretion in the stomach.

27. Assess the composition, functions and regulation of pancreatic, biliary and intestinal secretions.
28. Explain the mechanisms of nutrient absorption in the gastrointestinal tract

3. Syllabus

Cardiovascular physiology

Functional structure; pericardium; tones, electrical and mechanical activities; electrocardiography; cycling; output; ventricular function; cardiac regulation; biophysical circulation; arterial physiology; microcirculation; lymphatics; venous return; coronary, splanchnic, muscular and pulmonary circulations.

Respiratory functions

Functional structure; pleura; respiratory cycle; compartmentalization; mechanics; muscles; thoracic pressures; resistances; surface tension; surfactant; respiratory membrane gas exchange; blood gas transport; regulation of respiration.

Digestive system physiology

Functional structure; innervation and hormones; motility; salivary, gastric, pancreatic exocrine, biliary and intestinal secretions; absorption; faeces

Seminars:

Cardiovascular and respiratory adaptations to exercise; altitude; aging.

Practices:

Electrocardiography; auscultation, ultrasound (Plan 304); pressure; pulse; ergometry (Plan 305); spirometry; gasometry; digestive functional tests

4. Academic activities

1A Master Class: 40 hours (1.6 ECTS)

2A Problems and cases: 4 hours (0,16 ECTS)

3A Laboratory practices: 16 hours (0,64 ECTS)

All students will be informed about the risks that may be involved in the practices of this subject, as well as if dangerous products are handled and what to do in case of an accident, and must sign a commitment to comply with work and safety standards to perform them. For more information, consult the information for students of the Occupational Risk Prevention Unit: <http://uprl.unizar.es/estudiantes.html>.

6B Teaching assignments: 27 hours (1.08 ECTS)

7 Study: 60 hours (2.4 ECTS)

8 Evaluation: 3 hours (0,12 ECTS)

5. Assessment system

Minimum grade required 5 out of 10.

The assessment of the learning results will have two parts: 1/ Written exam (90% of the final grade) and it will explore theoretical and practical learning results. Students who have missed more than two practices will take a practical exam; 2/ Tutorial work (10% of the final grade). In case the student does not achieve a passing grade (5 out of 10) in the written exam, the grade in the minutes will be the grade obtained in that exam, without weighting with the tutored work. Honours will be awarded following the order of final grade (100%).

1/ The written exam (90% of the final grade): *First and second call*

- Contents: Complete theory and practice programs
- 70 minutes
- Evaluation Mode: 25 multiple-choice test questions (5 options, one correct). Of these, 5 will correspond to practices. Pass (5) with 15 points. 50% qualification. 4 questions (development, problems or short) of 10 minutes/question. 50% grade.

2/ Tutored work (10% of the final grade): It will only be applied upon passing the written exam. In case the student does not pass the subject, the grades above 5 in the tutored work will be kept for subsequent calls.