Universidad Zaragoza

Academic Year/course: 2024/25

32305 - Human Physiology II

Syllabus Information

Academic year: 2024/25
Subject: 32305 - Human Physiology II
Faculty / School: 104 - Facultad de Medicina
229 - Facultad de Ciencias de la Salud y del Deporte
Degree: 649 - Degree in Medicine
650 - Degree in Medicine
ECTS: 6.0
Year: 1
Semester: Second semester
Subject type: Basic Education
Module:

1. General information

1. Basic information on the subject [125 words or 850 characters]

This subject covers the functions of the renal excretion system, the blood, and the digestive system, as well as their regulation and contribution to the maintenance of general homeostasis. The knowledge and skills acquired in Physiology II are necessary to understand the pharmacology, pathophysiology, and medical-surgical pathologies of these systems.

These strategies are aligned with the Sustainable Development Goals of the United Nations 2030 Agenda (https://www.un.org/sustainabledevelopment/es/), and the knowledge and skills outcomes acquired through this subject contribute to a certain extent to their achievement: Objectives 3: Health and well-being, 4: Quality education; and 5: Gender equality.

2. Learning results

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

1. Understands the concept of homeostasis of the internal environment, is able to identify the body's liquid compartments and their composition, and lists the systems responsible for their regulation.
2. Understands the concept of acid-base balance and is able to identify the components of buffer systems in human biological fluids.
3. Is able to describe the role of the kidneys in the regulation of homeostasis, their endocrine and metabolic functions, including the regulation of acid-base balance.
4. Describes in sufficient detail the functional specialization throughout the nephron and the mechanisms involved (hemodynamics, glomerular filtration, reabsorption, and tubular secretion).
5. Is able to describe in sufficient detail the renal handling of water and solutes and integrates it into the neuroendocrine regulation of the volume and composition of the internal environment.
6. Describes the mechanism of the urination reflex, distinguishing the role of each component.
7. Is able to interpret the main kidney function tests and identify the range of normal values for the most relevant parameters.
8. Identifies the concepts of blood, serum, plasma and hematocrit, and specifies the range of normal values for the most relevant blood parameters.
9. Knows and describes the cellular and subcellular components of blood, and explains the formation, functions and regulation of red blood cells.
10. Is able to list blood groups and explain the molecular bases.

11. Describes the fundamental components in iron metabolism.
12. Describes in sufficient detail the mechanism of hemostasis, the functions of platelets, and the processes of blood coagulation and fibrinolysis.
13. Is capable of listing the main hemostasis and coagulation tests and identifies the range of normal values for the most relevant parameters.
14. Describes the cephalic phase of digestion, explaining chewing, the functions of saliva, and the swallowing reflex.
15. Describes gastric acid and mechanical digestion and their regulation.
16. Describes the intestinal digestion and absorption of nutrients, explaining the composition, functions, and regulation of pancreatic, biliary, and intestinal secretions.
17. Describes the intestinal reabsorption of water and solutes until the formation and expulsion of feces.
18. Integrates the macro- and microscopic structure of the segments of the digestive tract and its motor and digestive functions with their neuroendocrine regulation.
19. Begins knowledge of pathophysiology, acquiring reflective capacity on physiological processes from health and disease situations.
20. Is able to use biomedical sources of information: Ability to search for bibliography in PubMed (https://pubmed.ncbi.nlm.nih.gov/) to carry out a topic. Sufficient knowledge of English to be able to understand the scientific terminology of an international biomedical journal.

3. Syllabus

Kidney
Liquid Compartments. Homeostasis of acid-base balance. Glomerular filtration. Renal handling of water and solutes. Regulation of extracellular volume and composition. Urination reflex.
Blood
Composition of blood. Origin and functions of the red blood cell. Iron metabolism. Blood groups. Leukocyte formula. Hemostasis and platelet function. Coagulation, anticoagulation, and fibrinolysis.
Digestive system
Functional structure and neuro-hormonal regulation. Digestion and cephalic, gastric, and intestinal motility. Auxiliary secretions. Intestinal absorption, formation, and expulsion of feces.
Practices
Kidney function tests and urinalysis. Determination of blood parameters, hemostasis, and coagulation tests. Functional exploration of the digestive system.

4. Academic activities

1-Lectures. Theoretical content is presented during participatory sessions.
2-Seminars and resolution of clinical cases. Interactive sessions with the expansion of theoretical content and application to the resolution of real-life situations.
3-Laboratory practices. Acquisition of skills by performing simple laboratory techniques.

The student will be informed of the risks that may arise from carrying out these activities and the procedures in the event of an accident, signing the commitment to comply with work and safety regulations (http://uprl.unizar.es/estudiantes.html)
The materials used on the subject will be published in the ADD.
Attendance and completion of activities 2 and 3 are mandatory.
The time dedicated to this subject is completed with tutorials, evaluations, and the autonomous work of the

student.

5. Assessment system

1) Theoretical knowledge. They represent 80% of the final grade. They will be evaluated through multiple choice tests. The chance factor will be discounted, but not the failed answers. They will be approved with a grade of 5 out of 10.
- Midterm evaluation: in the middle of the semester, the possibility of eliminating a subject will be offered by passing a test on the contents covered to date. Students who pass it must take the rest of the subject in the final exam sessions, using a 50-question test. In this modality, the grade for this section will result from the average of the two midterms.
- Final exam (January and June calls): a test of 60 questions on the entire program (distributed according to the length of each block).
2) Practical knowledge and skills: They represent 20% of the final grade. Students must pass tests for each activity (laboratory, case resolution) as a continuous evaluation for in-person activities. On the day of the final exam, students who fail the continuous evaluation will be subjected to a global exam.
The theoretical part must be passed to take into account the grades obtained in the practical section.
Honorary enrolments will be awarded in order according to the grade obtained in the subject.

6. Sustainable Development Goals

3 - Good Health & Well-Being
4 - Quality Education
5 - Gender Equality