

Academic Year/course: 2021/22

26763 - Physiology II

Syllabus Information

Academic Year: 2021/22

Subject: 26763 - Physiology II

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: 1

Semester: Second semester

Subject Type: Basic Education

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. It favors the acquisition of knowledge related to Physiology. A wide range of teaching and learning tasks are implemented, such as lectures, practice sessions, and assignments.

Students are expected to participate actively in the class throughout the semester.

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 course-specific learning materials.

Further information regarding the course will be provided on the first day of class.

4.2. Learning tasks

The course includes 6 ECTS organized according to:

- Lectures 1,6 ECTS: 40 hours
- Practice sessions 0,64 ECTS: 16 hours
- Assignments 0,28 ECTS: 7 hours
- Autonomous work 3,24 ECTS: 81 hours
- Evaluation 0,24 ECTS: 6 hours
- In FCCSD,

Given the exceptional situation of the Academic Year 2021-2022, the large group teaching system could be online, that is to say, in a synchronic telematic system, by which teachers and students will be connected through technologies that allow interaction, such as Google Meet.

4.3. Syllabus

The course will address the following topics:

THEORETICAL PROGRAM

RENAL PHYSIOLOGY

- 1. Homeostasis and Renal Function
- 2. General structure and functions of the kidney.
- 3. Glomerular ultrafiltration. Concept of clearance.
- 4. Reabsorption and tubular secretion. Concept of Tm.
- 5. Osmotic activity of the kidney. Renal medullary hyperosmolarity, genesis and maintenance. Regulation of body osmolarity. Regulation of the water balance. Free water and osmolar clearance.
- 6. Balance and distribution of sodium, chloride ions. Renal management of sodium and chlorine. regulation of your balance. renin-angiotensin-aldosterone system. Regulation of its distribution. Renal regulation of extracellular volume.
- 8. Balance and distribution of potassium. Renal potassium management. Regulation of the balance and distribution.
- 9. Balance and distribution of calcium phosphorus and magnesium. Its Renal Management. Regulation of the balance.
- 10. Renal regulation of acid-base equilibrium.
- 11. Functions of the bladder and urinary tract.

FUNCTIONAL HEMATOLOGY

- 12. General characteristics and functions of blood.
- 13. Plasma components and functions.
- 14. Red blood cells: features and functions.
- 15. Post-embryonic stem cells. Classification. Growth factors and differentiation
- 16. Erythropoiesis and its regulation. Iron metabolism.
- 17. Red cell antigens.
- 18. Types and functions of leukocytes, Leucopoyesis.
- 19. Physiological haemostasis. Vascular responses. Functions of platelets.
- 20. Blood clotting. Activation and regulation of coagulation.
- 21. Physiological fibrinolysis. Mechanisms of anticoagulation. Functional tests of hemostasis.

IMMUNE SYSTEM

- 22. The immune system. Structure and organization of the immune system. Inborn immunity and adaptive immunity.
- 23. Main components of the immune system. Panoramic view of the immune response.
- 24. Innate immune response. Regulation of the activation. Cells and soluble factors. The complement.
- 25. Regulation of cellular activation and migration during the immune response: Cytokines, chemokines and adhesion molecules
- 26. Adaptive immune response. The B lymphocyte
- 27. Immunoglobulins. Structure and Function
- 28. Adaptive immune response. The helper T lymphocyte.
- 29. HLA system. Routes of antigenic presentation. Dendritic cells.
- 30. Cytotoxic response. Cytotoxic T lymphocytes and NK cells. Cell death.
- 31. Immune tolerance. Regulation of the immune response. Development, evolution and aging of the immune system.
- 32. Initiation to immunotherapy. Pharmacological modulation of the immune response in infection and cancer.

PRACTICE PROGRAM IN ZARAGOZA

- Urine (laboratory)
- Blood (collection, hematocrit, hemoglobin, erythrocyte sedimentation rate, blood groups, prothrombin time and clotting time) (laboratory)
- Leukocyte formula and platelets by cytometry (Laboratory)
- Functional problem of acute renal functional insufficiency
- Functional problem of hypernatremia
- Haemostasis functional problem
- Leukocyte formula and platelets by cytometry (Laboratory)
- Synthesis of antibodies and application to diagnosis (seminar)
- Manipulation of cellular immunity in cancer (seminar)

- Separation of lymphocytes
- Study of cellular morphology
- Agglutination reaction
- Immunochromatography techniques for detection of antigens and antibodies (Laboratory).

PRACTICE PROGRAM IN HUESCA

- Urine Concentration-Dilution Test
- Urine analysis. Urinary sediment
- Problem-Based Learning (ABP): Kidney
- Blood Groups and Hematocrit
- Simulation of blood extraction, velocity of sedimentation.
- ABP: Hematological Blood-Constants
- Leukocyte Formula and Lymphocyte Separation
- Seminar Immunology o Study of cellular morphology

4.4. Course planning and calendar

For further details concerning the timetable, classroom and further information regarding this course please refer to the "Facultad de Medicina" website (<http://www.unizar.es/estructura/facultades-y-escuelas/facultad-de-medicina>)

Zaragoza

<https://medicina.unizar.es/horarios>

Huesca

FCSYD website <https://fccsyd.unizar.es/horarios-y-calendarios-medicina>

4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=26763>