

## 26763 - Physiology II

### Syllabus Information

---

**Academic Year:** 2022/23

**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)

### 3.1. Assessment tasks (description of tasks, marking system and assessment criteria)

#### 3.1 Type of tests and their value on the final grade and evaluation criteria for each test

The student must demonstrate that she has achieved the expected learning outcomes through the following evaluation activities:

1-The Physiology II grade will be made by weighting the final grades obtained in Immunology and Physiology (1/3-2/3).

Enrollment will be given among the outstanding students in order of final grade

2- For a part (Physiology or Immunology) to be able to average with the others, a minimum grade of 5.0 points will be required in its final grade; Otherwise, the final grade that will appear in the course record will always be equal to or less than 4.9 points (failed). Those parts of the subject (Immunology or Physiology) with a grade equal to or greater than 5.0 points will be kept until September, without this affecting the student's right to retake the exam in order to improve the grade previously obtained.

The test exams, each question will have 5 possible answers and only one true, there will be no negatives.

Open-ended questions will explore the knowledge and skills expected in the learning outcomes.

#### EVALUATION OF "FUNCTION"

The evaluation of function learning outcomes will consist of three parts:

1st.- Written exam: You will have a voluntary (partial) eliminatory exam from 6 made with a test of 40 questions and 50 minutes of duration. The final exam in the June session

It will consist of a mixed test exam: 25 questions and 2 open-response questions; Your grade will be 50% for the test and 50% for the topics. Students who have passed the partial can present themselves at the end of June to raise their grade. Students who have eliminated the voluntary partial must take the final exam.

With the written exam a qualification will be obtained that will suppose 80% of the note of the subject. If the written exam does not exceed 5, the final function grade will be that of the exam without averaging with practices or work.

In the September session, the exam will consist of 4 open-response questions.

2nd.- The evaluation of the practices, including: laboratory practices and seminars, will be carried out by the professor who teaches it. Its average value will account for 15% of the final grade. Students who do not reach a 5 in the evaluation of practical activities or have more than 2 absences must take a practical exam.

3rd.- The evaluation of the tutored work will account for 5% of the final grade.

In case of not passing the subject, the notes above 5 of practices and work will be saved for later calls.

#### EVALUATION OF "IMMUNOLOGY"

The evaluation of the results of the learning of Immunology will be carried out:

1st.- Final exam (without partial) written: As in function.

2nd.- The evaluation of the laboratory practices will be carried out by the teacher who teaches them. Students who have 1

absence of attendance, unjustified, must take a practice exam. Its average value will account for 10% of the final grade.  
3rd.- The evaluation of the tutored work will account for 10% of the final grade. The tutored work will have to be sent by mail to the professor responsible for the subject before the date of the June exam. .

## 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

### 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  $T_m$ . Renal management of urea and uric acid
- 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.
- 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 )Urine concentration-dilution tests.
- 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
- 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

- GFR and FSR study
- Urine analysis. Urinary sediment
- Problem-Based Learning (ABP): Kidney
- Blood Groups and Hematocrit
- Simulation of blood extraction, blood gas test.
- Peripheral blood extension
- ABP: Hematological Blood-Constants
- ABP: allergy
- ABP: HIV
- ABP: Trasplant

### 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>