

## 26763 - Physiology II

### Syllabus Information

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**Academic Year:** 2019/20

**Subject:** 26763 - Physiology II

**Faculty / School:** 104 -  
229 -

**Degree:** 304 - Degree in Medicine  
305 - Degree in Medicine

**ECTS:** 6.0

**Year:** 305 - Degree in Medicine: 1  
304 - Degree in Medicine: 1

**Semester:** Second semester

**Subject Type:** Basic Education

**Module:**

## 1.General information

### 1.1.Aims of the course

### 1.2.Context and importance of this course in the degree

### 1.3.Recommendations to take this course

## 2.Learning goals

### 2.1.Competences

### 2.2.Learning goals

### 2.3.Importance of learning goals

## 3.Assessment (1st and 2nd call)

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

## 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

- Practice sessions
- Seminars
- Clinical problem-solving
- Autonomous work

### 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.
- 6. Regulation of water balance. Regulation of osmolarity.
- 7. Balance and distribution of sodium, chloride ions. Renal management of sodium and chlorine. Regulation of your balance.
- Renin-AII-Aldosterone System. Renal regulation of the 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. Erythropoiesis and its regulation. Iron metabolism.
- 16. Red cell antigens.
- 17. Types and functions of leukocytes, Leucopoyesis.
- 18. Physiological haemostasis. Vascular responses. Functions of platelets.
- 19. Blood clotting. Activation and regulation of coagulation.
- 20. Physiological fibrinolysis. Mechanisms of anticoagulation. Functional tests of hemostasis.

##### IMMUNE SYSTEM

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

##### PRACTICE PROGRAM IN ZARAGOZA

- Urine Concentration-Dilution Test
- Urine analysis. Urinary sediment
- Functional problem in "Hypernatremia"
- Functional problem in "Hemostasis"

- Blood extraction
- Sedimentation Rate
- Blood groups
- Hematocrit
- Coagulation time and Prothrombin time
- Osmotic resistance and haemolysis
- Leukocyte Formula by Flow Cytometry
- Collection of platelet-rich plasma and its determination by cytometry
- Collection of platelet-rich plasma and its determination by cytometry
- Synthesis of antibodies and application to diagnosis (seminar)
- Manipulation of cellular immunity in cancer (seminar)
- Separation of lymphocytes
- Study of cellular morphology
- Agglutination reaction

#### 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://psfunizar7.unizar.es/br13/eBuscar.php?tipo=a>