

**COURSE DATA****Data Subject**

<b>Code</b>	34070
<b>Name</b>	Physiology I
<b>Cycle</b>	Grade
<b>ECTS Credits</b>	6.0
<b>Academic year</b>	2020 - 2021

**Study (s)**

<b>Degree</b>	<b>Center</b>	<b>Acad. year</b>	<b>Period</b>
1201 - Degree in Pharmacy	Faculty of Pharmacy and Food Sciences	2	First term
1211 - D.D. in Pharmacy-Human Nutrition and Dietetics	Faculty of Pharmacy and Food Sciences	2	First term

**Subject-matter**

<b>Degree</b>	<b>Subject-matter</b>	<b>Character</b>
1201 - Degree in Pharmacy	18 - Physiology	Basic Training
1211 - D.D. in Pharmacy-Human Nutrition and Dietetics	1 - Asignaturas obligatorias del PDG Farmacia-Nutrición Humana y Dietética	Obligatory

**Coordination**

<b>Name</b>	<b>Department</b>
CARRETERO ASUNCION, JULIAN	190 - Physiology

**SUMMARY**

Physiology I is a four-month core-subject course in the Pharmacy Degree Program. It is taught in the first four-month period of the second year of study. It consists of 6 ECTS credits and has both theoretical and experimental components.

The overall objectives of this course are:



- To gain an understanding of normal human body functions which will provide a basis for the comprehension of other subjects (Pathophysiology, Biological and Diagnostic Laboratory Analysis, Pharmacology, etc.) Also to understand the effect of medications at the cellular, organ and organ-system levels.
- To train students in basic laboratory techniques and instrument skills, especially those that allow them to explore organ functions and interpret experimental data.

## PREVIOUS KNOWLEDGE

### Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

### Other requirements

Knowledge of Biology and Anatomy.

## OUTCOMES

### 1201 - Degree in Pharmacy

- To possess and to understand the knowledge in the different areas of study included in the formation of the pharmacist.
- To apply this knowledge to the professional world, contributing to the development of Human Rights, democratic principles, principles of equality between women and men, solidarity, protection of the environment and promotion of a culture of peace with Gender perspective.
- To know how interpret, value and communicate relevant data in the different aspects of pharmaceutical activity, making use of information and communication technologies.
- Skill to communicate ideas, analyze problems and solve them with a critical mind, achieving team-working abilities and assuming leadership whenever required.
- Development of skills to update their knowledge and undertake further studies, including pharmaceutical specialization, scientific research and technological development, and teaching.
- To recognize personal limitations and the need to keep up to date professional competence, paying particular attention to the self-learning of new knowledge based on available scientific evidences.
- Skills for oral and written presentations.
- To develop habits of excellence and quality in the professional career.
- To know and understand the basic principles and laws that govern the function of our cells, organs, apparatus and systems.
- To know and understand the basic physiology of the human body, from the molecular level to the whole organism, in the different stages of life.



- To know and interpret how each organ participates in the maintenance of a constant internal environment.
- To know the mechanisms of regulation that control the different functions and the mutual interactions of the different corporal systems.
- To learn how to understand the organism as a whole.
- To use of the scientific bibliography of the subject.

## LEARNING OUTCOMES

Acquisition of the capabilities described in the previous section.

## DESCRIPTION OF CONTENTS

### 1. General and cellular Physiology

Introduction to the study of Physiology. General and cellular Physiology. Functional organization of the human body. Internal environment. Homeostasis. Body fluid compartments. Functions of cell membranes. Excitability. Action potential. Nerve impulse conduction. Synaptic transmission. Effectors. Excitation and contraction of skeletal, smooth and cardiac muscles. Functional organization of the nervous system. Autonomic nervous system.

### 2. Blood Physiology

Properties and functions of the blood. Erythrocytes. Regulation of erythropoiesis. Iron metabolism. Leukocytes. Blood group system. Hemostasis and blood coagulation.

### 3. Cardiovascular physiology

Functions of the cardiovascular system. Electrical and mechanical activity of the heart. Cardiac output. Regulation of cardiac function. Hemodynamics. Systemic circulation. Blood pressure. Capillary, venous and lymphatic circulation. Integration of cardiovascular function. Regulation of blood pressure. Pulmonary circulation. Circulation Through Special Regions.

### 4. Respiratory Physiology

Functions of the respiratory system. Mechanics of pulmonary ventilation. Pulmonary ventilation and alveolar ventilation. Gas exchange. Transport of gases in blood. Regulation of ventilation.

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Theory classes	38,00	100
Laboratory practices	14,00	100
Seminars	2,00	100
Tutorials	2,00	100
Development of group work	10,00	0
Development of individual work	2,00	0
Study and independent work	18,00	0
Preparation of evaluation activities	25,00	0
Preparing lectures	30,00	0
Preparation of practical classes and problem	5,00	0
<b>TOTAL</b>	<b>146,00</b>	

**TEACHING METHODOLOGY**

Development of the course:

- 38 Lectures of theoretical contents, 1 hour / lecture.
  - Lesson 1, General and cellular Physiology: 17 lectures.
  - Lesson 2, Blood Physiology: 6 lectures
  - Lesson 3, Cardiovascular physiology: 10 lectures.
  - Lesson 4, Respiratory Physiology: 5 lectures
- 4 practical classes of laboratory experiments:
  - 1: Osmotic phenomena in living organisms, 4 hours.
  - 2: Haematology, 4 hours.
  - 3: Blood pressure, electrocardiogram and auscultation, 4 hours.
  - 4: Spirometry, 2 hours.
- 2 in-class tutorial sessions throughout the course (1 hour/session).
- 2 seminars throughout the course (1 hour).
- Teamwork: a written report submitted in an electronic file.



## EVALUATION

### **Continuous evaluation (25% of final score).**

- Multiple choice test (10% of final score), according to the official calendar, and including the theoretical content of the Unit 1.
- Seminars (Teamwork) (10% of final score). An evaluation of the personal involvement of each student and the quality of the presentation.
- Practical classes (5% of the final score) will be evaluated for their achievement (personal and team work of each student). Attendance at practices is mandatory.

**- Important note: the unjustified unattendance at the practical sessions implies not being able to do the theoretical exam for the final evaluation, and the failure of the subject.**

### **Final evaluation, 1st call (75% of final score)**

- Theoretical Exam (60% of the final score): multiple-choice test to be held on a date according to the official school calendar, which includes theoretical contents of the entire course. This exam must reach at least 50% of the maximum score to pass the course. In this first call, students who do not attend the final exam will appear on the records as 'no presentado'.
- Practical Exam (15% of the final grade). Multiple-choice test to be held in the same session as the theoretical exam, that will include the contents of the practice sessions. It will be necessary to reach at least 50% of the maximum score to pass this practical exam and incorporate the qualification to the final score.

### **Final evaluation, 2nd call.**

Those students who do not pass the course in the 1st call, having suspended the theoretical and/or practical exam, must attend to the 2nd call of the corresponding part. If they reach at least 50% of the maximum score in each of the theoretical and practical exams, the final score will be calculated as follows: 70% theoretical exam, 15% practical exam, 10% team seminar, and 5% continuous evaluation of practical classes.

Students who do not attend to the 2nd call, will appear in the records as "suspense", with a numerical value equal to the sum of the activities. When they do not pass the course, realization of the practical sessions and the seminar teamwork will be optionally validated in the next academic year, only if they reached at least 50% of the maximum score in the practical exam, the seminar work, and the continuous evaluation of practical classes.





## REFERENCES

### Basic

- Berne y Levy. Fisiología. Ed. Elsevier.
- Conti. Fisiología Médica. Ed Mc Graw Hill.
- Costanzo. Fisiología. Ed. Elsevier.
- Fox. Fisiología Humana. Ed. McGraw-Hill Interamericana.
- Ganong. Fisiología Médica. Ed Mc Graw Hill.
- Guyton. Tratado de Fisiología Médica. Ed. Elsevier.
- Mulroney y Myers. Netter. Fundamentos de Fisiología. Ed Elsevier.
- Pocock y Richards. Fisiología Humana. La base de la Medicina. Ed. Masson.
- Rhoades y Tanner. Fisiología Médica. Ed. Masson.
- Silverthorn. Fisiología Humana. Un enfoque integrado. Ed. Panamerica.
- Thibodeau y Patton. Estructura y función del cuerpo humano. Ed. Elsevier.
- Tortora y Derrickson. Principios de Anatomía y Fisiología. Ed. Panamericana.

### Additional

- Putz y Pabst. Atlas de Anatomía Humana Sobotta. Ed Panamericana
- Yong y Heath. Wheaters Histología Funcional. Ed Harcourt
- Berg, Tymoczko y Stryer. Bioquímica. Ed. Reverté

## ADDENDUM COVID-19

**This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council**

### 2. Volume of work and temporary planning of teaching

The workload is maintained, but a hybrid model will be followed with classroom and non-classroom teaching.

### 3. Teaching methodology

The activities usually scheduled in the subject adapted to the hybrid modality will be carried out, which will combine face-to-face teaching (practices, tutorials, seminars) with non-face-to-face teaching (theoretical classes).

The tools for teaching non-face-to-face theoretical teaching will include synchronous videoconferences through Blackboard, didactic material available in the Virtual Classroom and the completion of self-evaluation forms. The videoconference sessions will be held at the scheduled time for the face-to-face classes provided by the grade coordination.



The practical teaching will be carried out face-to-face with the required capacity and distance restrictions, and will be completed with didactic material that will introduce the theoretical bases of the tasks to be carried out, problems related to laboratory work and videos recorded in the laboratory, all of this available in the Virtual Classroom.

In case of not being able to do the tutorials, seminars and practices in person, the tools described above will be used to carry them out.

#### **4. Evaluation**

The percentage corresponding to continuous evaluation has increased (40% compared to 25% of the Teaching Guide) to adapt to the COVIDE situation. The distribution of the subparts is modified as follows:

##### **Continuous evaluation (40% of the final score)**

- Questionnaires (20% of the final score) with multiple-choice questions from the four modules (General, Blood, Cardiovascular and Respiratory Physiology), will be conducted online through a Virtual Classroom with limited time.
- Seminars and problems (10% of the final grade): face-to-face activities related to the theoretical modules will be carried out, which will be evaluated by means of Virtual Classroom questionnaires.
- Practices (10% of the final grade): the attitude and the correct execution of the face-to-face practical procedures will be evaluated, as well as the resolution of problems and questions that will be carried out online through Virtual Classroom questionnaires.

**Final evaluation (60% of the final score):** single final exam with multiple-choice questions that will be done in person according to the official calendar of the center. In case the exam cannot be done in person, it will be done online through the Virtual Classroom. In the event that technical problems occur during the exam, the student will report said incident using the Virtual Classroom tools and/or email, and an alternative solution will be arbitrated so that they can proceed.