

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

Code	34071
Name	Physiology II
Cycle	Grade
ECTS Credits	6.0
Academic year	2020 - 2021

Study (s)

Degree	Center	Acad. year	Period
1201 - Degree in Pharmacy	Faculty of Pharmacy and Food Sciences	2	Second term
1211 - Double Degree in Pharmacy and Human Nutrition and Dietetics	Faculty of Pharmacy and Food Sciences	2	Second term

Subject-matter

Degree	Subject-matter	Character
1201 - Degree in Pharmacy	18 - Physiology	Basic Training
1211 - Double Degree in Pharmacy and Human Nutrition and Dietetics	1 - Asignaturas obligatorias del PDG Farmacia-Nutrici3n Humana y Diet3tica	Obligatory

Coordination

Name	Department
CARRETERO ASUNCION, JULIAN	190 - Physiology

SUMMARY

Physiology II is a four-month core-subject course in the Pharmacy Degree Program. It is taught in the second 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.

COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

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 (RD 1393/2007) // NO CONTENT (RD 822/2021)

Acquisition of the capabilities described in the previous section.

DESCRIPTION OF CONTENTS

1. Digestive Physiology.

Functions of the digestive system. Digestive processes in the mouth, pharynx and esophagus. Motility, gastric secretion and digestion. Pancreatic and biliary secretions. Liver Physiology. Motility, secretion, digestion and absorption in the small intestine. Motility, secretion and absorption in the colon. Defecation.

2. Renal Physiology

Functions of the kidneys. Glomerular filtration. Tubular functions. Water reabsorption and regulation of urine concentration. Regulation of acid-base balance. Physiology of the urinary tract. Urination.

3. Nervous system Physiology

Functions of the Nervous System. Performance levels of the Central Nervous System. Neural circuits. Sensory physiology. Somatic sensibility. Chemical senses. Vision. Hearing and equilibrium. Control of posture and locomotion. Behavioral and motivational mechanisms of the brain. Wakefulness and sleep. Higher Functions of the nervous system.

4. Endocrine System Physiology

Introduction to Endocrinology. Neuroendocrine integration. Hypothalamic- hypophysis axis. Adenohypophysis. Neurohypophysis. Pineal gland. Thyroid. Phosphocalcic Homeostasis. Adrenal cortex and medulla. Endocrine pancreas. Reproductive system.

**5. Skin Physiology**

Physiology of the skin. Regulation of body temperature.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	34,00	100
Seminars	12,00	100
Laboratory practices	10,00	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
TOTAL	148,00	

TEACHING METHODOLOGY

Development of the course:

- 34 Lectures of theoretical contents, 1 hour / lecture.
 - Lesson 1, Digestive Physiology: 7 lectures.
 - Lesson 2, Renal Physiology: 5 lectures.
 - Lesson 3, Nervous System Physiology: 10 lectures.
 - Lesson 4, Endocrine System Physiology: 11 lectures.
 - Lesson 5, Skin Physiology: 1 lecture.
- 3 practical classes of laboratory experiments:
 - 1: In vitro digestion, 4 hours.
 - 2: Evaluation of the sensory system, 3 hours.
 - 3: Evaluation of the motor system, 3 hours.
- 2 in-class tutorial sessions throughout the course (1 hour/session).
- 12 seminars throughout the course (1 hour/session).



- 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 Units 1 and 2.
- 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. Unjustified assistance to any of the practice sessions implies failing the course.

- 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 "suspensio", 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.
- Silverthon. 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

1. Contents

The contents initially included in the teaching guide are maintained.

2. Volume of work and temporal planning of teaching

The workload for the student is maintained, derived from the number of credits, but the methodology of the activities changes with respect to the teaching guide, due to the current situation that makes it necessary to adopt a hybrid teaching model.

3. Teaching methodology

• Theoretical teaching: They will be face-to-face and in accordance with the course calendar, but with the appropriate modifications to comply with the safety regulations against CoVid19. In the event that the capacity of the classroom does not allow the presence of the entire group of students, the students will be distributed by groups, so that 50% will be in the Faculty classroom while the other 50% will connect online (from home), alternating their attendance for weeks. The class will always be held following the



schedule (date and time) approved by the Board.

- Tutorials and Seminars: All will be face-to-face according to the dates set by the course calendar.
 - Practical classes: They will be face-to-face and according to the course calendar, but with the appropriate modifications to comply with the safety regulations against CoVid19, limiting the capacity of the laboratories to 50%, establishing attendance shifts in each group. To cover the non-face-to-face teaching of the sessions, audiovisual material will be used to introduce the theoretical bases of the tasks to be carried out, problems related to laboratory work and any other material that allows complementing what was seen in the laboratory sessions, their execution and interpretation .
- If there were a worsening of the situation or a state of total confinement, all or part of this face-to-face teaching would be carried out online with synchronous teaching.

4. Evaluation

If the evolution of the current pandemic allows it, it will be face-to-face and in the terms indicated in the teaching guide. Only in case this is not possible, the evaluation will be carried out online, using multiple-choice questions in the virtual classroom that can be supplemented with short questions and / or on certain occasions through an oral exam via videoconference.

The percentage corresponding to continuous assessment increases (40% compared to 25% in the Teaching Guide) to adapt to the new situation. The distribution of the subparts is modified as follows:

- Continuous assessment (40% of the final grade):
 - Questionnaires (20% of the final grade) with multiple-response questions from the four modules (Digestive, Renal, Nervous and Endocrine), will be done online through Virtual Classroom with limited time.
 - Seminars and problems (10% of the final grade): there will be face-to-face activities related to the theoretical modules that will be evaluated through questionnaires from the Virtual Classroom.
 - Practices (10% of the final grade): the attitude and the correct execution of the practical face-to-face procedures will be evaluated, as well as the resolution of problems and questions that will be carried out online through questionnaires in the Virtual Classroom.
- Final evaluation (60% of the final grade): single final exam with multiple-choice questions to be carried out in person according to the official calendar of the center. In the event that the exam cannot be taken in person, it will be carried out online through the Virtual Classroom. In the event of technical problems during the exam, the student will report said incident through the Virtual Classroom tools and / or email, and an alternative solution will be found so that they can take the exam.