

**Systems Physiology**

Code: 101905  
ECTS Credits: 12

Degree	Type	Year	Semester
2501230 Biomedical Sciences	FB	2	A

## Contact

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## Teaching groups languages

You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject. Please note that this information is provisional until 30 November 2023.

## Teachers

Juan Hidalgo Pareja

## Prerequisites

It is desirable that the student has acquired basic knowledge and competences on the structure and organization of the human body and its cellular systems.

It is important that the student has acquired the basic knowledge and competences of the course Histology and General Physiology.

To be able to attend the sessions of laboratory practices, the student must justify having passed the biosafety and security tests that will be found in the Virtual Campus and be knowledgeable and accept the operating regulations of the laboratories of the Faculty of Biosciences.

## Objectives and Contextualisation

The subject Physiology of Systems is programmed during the second course of the Degree in Biomedical Sciences and develops the knowledge of the normal functioning of the following systems of the human organism: blood and haematopoietic organs, cardiovascular system, respiratory system, excretory system and body fluids, digestive system, endocrine system and reproductive system.

The acquisition of the basic competences of the subject will allow the student to confront with a sufficient base the study of the physiopathology and the understanding of the mechanisms of diseases that affect the diverse systems of the human organism during the following courses.

The general training objectives of the subject are:

Learn the basic concepts of Physiology of the different functional systems of the human body in a state of health.

Acquire a complete and integrated vision of the interrelations of the different systems of the organism. Integrate the knowledge of Physiology with those acquired in other basic subjects, which deal with the structure and the cellular and molecular aspects of the organism, in order to achieve a global vision of the functioning of the human body.

To train the student to apply the physiological knowledge in the deduction of the consequences of the pathological alterations of the human organism.

Acquire the practical skills necessary to carry out techniques of frequent functional studies in the biomedical field

## Competences

- Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.
- Apply knowledge acquired to the planning and implementation of research, development and innovation projects in a biomedical research laboratory, a clinical department laboratory or the biomedical industry.
- Describe biomedical problems in terms of causes, mechanisms and treatments.
- Display knowledge of the bases and elements applicable to the development and validation of diagnostic and therapeutic techniques.
- Display knowledge of the basic life processes on several levels of organisation: molecular, cellular, tissues, organs, individual and populations.
- Display knowledge of the concepts and language of biomedical sciences in order to follow biomedical literature correctly.
- Make changes to methods and processes in the area of knowledge in order to provide innovative responses to society's needs and demands.
- Read and critically analyse original and review papers on biomedical issues and assess and choose the appropriate methodological descriptions for biomedical laboratory research work.
- Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
- Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
- Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
- Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.
- Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
- Take account of social, economic and environmental impacts when operating within one's own area of knowledge.
- Work as part of a group with members of other professions, understanding their viewpoint and establishing a constructive collaboration.

## Learning Outcomes

1. Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.
2. Analyse and identify the functional disorders, at the level of each system, caused by several types of diseases.
3. Analyse the functional mechanisms of hydrosaline and acid-base equilibrium in organisms.
4. Analyse the functional mechanisms that allow the organism to adapt to the principal variations in the environment.
5. Correctly use the terminology of physiology and its text and reference books.
6. Describe the function and characteristics of the different components of blood.

7. Describe the function and the regulating mechanisms of the cardiovascular system.
8. Describe the function and the regulating mechanisms of the digestive system.
9. Describe the function and the regulating mechanisms of the endocrine system.
10. Describe the function and the regulating mechanisms of the excretory system.
11. Describe the function and the regulating mechanisms of the female reproductive system.
12. Describe the function and the regulating mechanisms of the male reproductive system.
13. Describe the function and the regulating mechanisms of the respiratory system.
14. Describe the functional mechanisms of metabolism and nutrition.
15. Describe the principal experimental techniques in physiology and their use in basic and applied research.
16. Display the necessary practical skills to perform the most common functional study techniques in the biomedical field.
17. Identify and apply suitable functional study methodologies for the development of research projects.
18. Identify the basic mechanisms of cell and tissue physiology.
19. Make changes to methods and processes in the area of knowledge in order to provide innovative responses to society's needs and demands.
20. Perform basic techniques for evaluating physiological systems.
21. Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
22. Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
23. Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
24. Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.
25. Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
26. Take account of social, economic and environmental impacts when operating within one's own area of knowledge.
27. Understand scientific texts on physiology of the different systems and write review papers on these.
28. Understand the regulatory mechanisms of the nervous system.
29. Work as part of a group with members of other professions, understanding their viewpoint and establishing a constructive collaboration.

## **Content**

theoretical program  
 problems and clinical cases  
 laboratory practices

## **Methodology**

Theoretical classes:

Systemized exhibition of the subject's agenda, giving relevance to the most important concepts. The student acquires the basic scientific knowledge of the subject attending classes of theory, which will complement the personal study of the exposed subjects.

classroom practices:

Presentation and work on cases or problems of relevance to the learning of the subject. The knowledge acquired in the theory classes and in the personal study apply to the resolution of practical cases that are posed in the seminars. Students work in small groups.

Practical classes:

Practical sessions for the observation and realization of procedures, the practical learning of physiological techniques. It promotes group work and active self-learning.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
classroom cases resolution	20	0.8	3, 4, 2, 28, 27, 16, 14, 7, 8, 9, 10, 11, 12, 13, 6, 15, 18, 17, 20, 5
practical laboratory techniques	15	0.6	3, 4, 2, 28, 27, 14, 7, 8, 9, 10, 11, 12, 13, 6, 15, 18, 17, 5
theoretical expositions	71	2.84	3, 4, 2, 28, 27, 14, 7, 8, 9, 10, 11, 12, 13, 6, 18
Type: Supervised			
supervised type	5	0.2	
Type: Autonomous			
questions resolution	45	1.8	3, 4, 2, 28, 27, 14, 7, 8, 9, 10, 11, 12, 13, 6, 15, 18, 17, 5
study	90	3.6	3, 4, 28, 27, 14, 7, 8, 9, 10, 11, 12, 13, 6, 15, 18, 17, 5
works elaboration	39	1.56	3, 4, 2, 28, 27, 14, 7, 8, 9, 10, 11, 12, 13, 6, 15, 18, 17, 5

## Assessment

The competences of this subject will be evaluated by means of:

1- Evaluation of theoretical knowledge by means of objective test examinations (70% of the final grade).

There will be three partial evaluations of the subject, with a weight proportional to the number of classes taught. These tests will consist of questions of development and/or of pot type, where the whole subject of the subject will be treated. It is necessary to obtain a grade equal or higher than 5 in each partial evaluation to consider that part as achieved. The parts not passed will be able to be recovered in a final test of recovery.

2 - Evaluation of the problems, cases and works carried out in the seminars (15% of the final grade).

By their nature, the seminars/case studies are not recoverable activities. Failure to complete a particular seminar will result in a grade of 0.0 for the activity in question.

3- Evaluation of practical knowledge (laboratory practices) (15% of the final grade).

The practical activities can be evaluated on the basis of two activities: y) questionnaires of the laboratory practices (5% of the grade, if applicable); ii) exams of practical contents (10% of the grade, if applicable) (three practical exams will be carried out coinciding with the theory exams).

In order to attend the laboratory practice sessions, the student must prove that he/she has passed the biosafety and security tests that can be found in the Virtual Campus and that he/she is aware of and accepts the rules of operation of the laboratories of the Faculty of Biosciences. The laboratory practicals are compulsory activities according to the regulations of the Faculty of Biosciences.

Practicum grades are not recoverable or modifiable.

- Calculation of the final grade:

Final grade = Weighted grade of the theoretical midterm (70%) + Seminar grade (15%) + Practical grade (15%).

- Repeating students: No grade will be kept from one course to the next. Repeating students can make partial waivers:

(i) Waive the completion of the practical sessions. In this case, they will have to take the practical exam, like the rest of the students, and the grade obtained in the exam will represent their final practical grade (15% of the final grade).

ii) Waiving the seminars. . In this case, the final grade will be calculated as theory (85%) + practical (15%).

"To participate in the evaluation, the student must have been previously evaluated in a set of activities the weight of which is equivalent to a minimum of two thirds of the total grade of the subject or module. Therefore, the student will obtain the grade of "Not Evaluable" when the evaluation activities performed have a weight of less than 67% in the final grade".

Single evaluation: This subject does not include a single evaluation.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Assessment of theoretical knowledge through 3 objective multiple choice tests. In some aspects of the program, the ability to solve and describe, through written development questions, will be evaluated	70%	9	0.36	1, 26, 3, 4, 2, 28, 14, 7, 8, 9, 10, 11, 12, 13, 6, 15, 18, 17, 25, 21, 22, 5
Evaluation of practical knowledge through tests, analysis of data and tests	15%	3	0.12	3, 4, 2, 28, 16, 14, 7, 8, 9, 10, 11, 12, 13, 6, 15, 18, 17, 23, 20, 29, 5
Evaluation of the preparation and presentations of the problems and cases and of works carried out	15%	3	0.12	1, 3, 4, 2, 28, 27, 16, 14, 7, 8, 9, 10, 11, 12, 13, 6, 15,

## **Bibliography**

### GENERAL REFERENCES:

BERNE R, LEVY M. *Fisiología* (7a ed.). Elsevier-Mosby, 2018.

GUYTON AC, HALL JE. *Tratado de Fisiología Médica* (12ª ed.). Elsevier-Saunders, 2011.

POCOCK G, RICHARDS CD. *Fisiología humana. La base de la Medicina* (2ª ed.). Masson, 2005.

TRESGUERRES JAF. *Fisiología Humana* (5ª ed.). Mc Graw Hill-Interamericana, 2020.

JOHNSON, LR. *Gastrointestinal Physiology* (7º ed.). Mosby - Physiology Mongraphs, 2007.

### References in digital format:

Several of the proposed texts are available in digital version through the UAB Library Service. It is recommended to follow the following guide for the location of digital texts:

<https://ddd.uab.cat/pub/guibib/224929/bibrecdigitals.pdf>

## **Software**

This subject does not use any specific software.