

Systems Physiology

Code: 101905
ECTS Credits: 12

| Degree | Type | Year | Semester |
|-----------------------------|------|------|----------|
| 2501230 Biomedical Sciences | FB | 2 | A |

Contact

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Use of Languages

Principal working language: spanish (spa)
Some groups entirely in English: No
Some groups entirely in Catalan: No
Some groups entirely in Spanish: No

Other comments on languages

The three official languages of the UAB can be used: Catalan, Spanish and English.

Teachers

Juan Hidalgo Pareja
Maria Amalia Molinero Egea

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

Evaluation

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

- Assessment of theoretical knowledge through objective test exams. In some aspects of the program, the ability to solve and describe, through written development questions (70% of the final grade)

There will be three partial assessments of the subject, and the weight of each one's note will be, in the final result of the theoretical evaluation, proportional to the number of classes taught. It is necessary to obtain a qualification equal to or greater than 5 in each theoretical partial block to consider that part as achieved. The examination of recovery will allow to recover only the suspended theoretical knowledge part.

Students who want to change the final grade may do so by presenting themselves to a synthesis test for the entire subject.

- Evaluation of the preparation and presentations of the problems and cases and of works carried out (15% of the final note). The non-completion of a particular seminar implies a rating of 0.0 for the activity in question.

- Evaluation of practical knowledge, through results and questionnaires of laboratory practices (5%) and exams of practical contents (10% of the final mark). In order to be able to attend the sessions of laboratory practices, the student must justify having passed the biosafety and security tests that he will find in the Virtual Campus and be knowledgeable and accept the rules of operation of the laboratories of the Faculty of Biosciences.

Practical notes, as well as problems and cases, can not be retrieved or modified later. It is VERY IMPORTANT

to get a good qualification in practice and seminars or classroom practices since they can suspend the subject even though the theoretical part is approved.

It will be considered "non-evaluable" when the number of evaluation activities carried out is less than 50% of the programmed activities.

- Repeater students: no note / qualification will be saved from one course to the next. The repetitive students can resign to the realization of the practical sessions. In this case, they will have to examine the practices, like the rest of the students, and the mark obtained in the exam will represent their final qualification of practices (15% of the final score). The score of seminars (15% of the final mark of the subject) for repeaters that explicitly renounce seminars will not be taken into account, the final grade will be calculated in 85% of theory and 15% practice.

"To participate in the recovery, the students must have been previously evaluated in a set of activities whose weight equals to a minimum of two thirds of the total grade of the subject or module. Therefore, Students will obtain the "Non-Appraising" qualification when the evaluation activities carried out have a weighting of less than 67% in the final grade. "

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, 18, 17, 19, 24, 20, 5 |

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 Monographs, 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.