

**Animal Physiology**

Code: 100932  
ECTS Credits: 6

| Degree                | Type | Year | Semester |
|-----------------------|------|------|----------|
| 2500253 Biotechnology | FB   | 2    | 1        |

**Contact**

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**Use of languages**

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: No  
Some groups entirely in Spanish: No

**External teachers**

Cristina Costa Valles

**Prerequisites**

It is recommended to refresh concepts learnt at the subjects of the first course 'Cellular Biology' and 'Biochemistry'.

**Objectives and Contextualisation**

To gain knowledge of the organization, the anatomical bases and the functional aspects of animal physiological systems, focused in humans.

To identify the role and importance of the main regulatory or control systems.

To know the biophysical, cellular, molecular and biochemical bases of the physiological systems to better understand how they work.

To understand the different physiological systems as highly interrelated and integrated entities.

To be able to understand the basics of physiology as a necessary basis for the development of biotechnological applications.

**Skills**

- Describe the molecular, cellular and physiological bases of the organisation, functioning and integration of living organisms in the framework of their application to biotechnological processes.
- Learn new knowledge and techniques autonomously.
- Read specialised texts both in English and ones own language.
- Search for and manage information from various sources.
- Think in an integrated manner and approach problems from different perspectives.
- Use ICT for communication, information searching, data processing and calculations.
- Work individually and in teams

## **Learning outcomes**

1. Analyse the functional mechanisms of hydrosaline and acid-base equilibrium in organisms.
2. Describe the basic mechanisms of cell and tissue physiology.
3. Describe the macro- and microscopic structure and the functioning of the nervous system
4. Explain the function and characteristics of the different components of blood.
5. Explain the function and the mechanisms regulating the cardiovascular, respiratory, excretory, digestive, endocrine and reproductive systems in men and women.
6. Learn new knowledge and techniques autonomously.
7. Read specialised texts both in English and ones own language.
8. Search for and manage information from various sources.
9. Think in an integrated manner and approach problems from different perspectives.
10. Use ICT for communication, information searching, data processing and calculations.
11. Work individually and in teams

## **Content**

Introduction to Physiology.

Intercellular communication.

Electrical excitability I: neurons.

Electrical excitability II: muscle.

Liquid compartments. Blood.

Cardiovascular physiology.

Respiratory physiology.

Renal function.

Gastrointestinal physiology.

Metabolism and thermoregulation.

Endocrine system.

Reproduction.

Nervous system.

## **Methodology**

### **Lectures**

Master classes given by the Lecturer about the basic skills and knowledge on a particular physiological subject to be acquired by the students, with the support of on-site audiovisual teaching material, previously accessible at the Campus Virtual. It is highly recommended to attend the Lectures, and must necessarily be accompanied by the personal study.

### **Problems / Seminars**

In these classes, students will normally work in small groups of 3-4 people, and sometimes individually, in: 1. solving questions, cases and physiological problems, 2. reading and critical analysis of news, scientific dissemination texts and / or scientific literature, 3. resolution of doubts that arise as the course progresses, 4. preparation and public exposition of topics that the teacher will indicate.

## Activities

| Title                   | Hours | ECTS | Learning outcomes           |
|-------------------------|-------|------|-----------------------------|
| <b>Type: Directed</b>   |       |      |                             |
| Lectures                | 30    | 1.2  | 1, 2, 3, 5, 4               |
| Seminars                | 15    | 0.6  | 1, 10, 8, 2, 3, 5, 4, 7, 11 |
| <b>Type: Supervised</b> |       |      |                             |
| Case/problem-solving    | 15    | 0.6  | 6, 1, 2, 3, 5, 4, 9, 11     |
| <b>Type: Autonomous</b> |       |      |                             |
| Personal study          | 55    | 2.2  | 6, 1, 2, 3, 5, 4, 7, 9      |
| Preparation of works    | 25    | 1    | 10, 8, 7                    |

## Evaluation

This subject is evaluated along the course and includes more than three evaluation activities, with different evaluation typologies, distributed along the course. None of these activities represents more than 50% of the final mark.

**Theory.** It will be evaluated individually in two partial exams, each consisting of 30-50 test-type questions. Each partial exam will weigh 50% of the theory. The two partial exams will be averaged only if the mark of each partial is  $\geq 4.00$ . When the mark of one partial exam is  $< 4.00$  and the mark of the other partial exam is  $\geq 5.00$ , the final exam will have to be only taken for the failed part, with one exception: if the mark of the first partial exam is  $\geq 8.00$  and the mark of the second partial exam is  $\leq 3.00$ , the student will have to attend the final exam of all the subject. Likewise, if a student takes one partial exam only, he/she does not obtain the maximum mark, and he/she does not attend the examination of the other partial, he/she will have to attend the final examination of all the subject as well. This theoretical part represents 80% of the final mark of the subject and must be passed with a mark  $\geq 5.00$  in order to make a weighted average with the mark of seminars/problems.

**Seminars / problems.** There will be several individual and collective evaluations (in small groups), which will be based on problem solving, written comments on scientific news / articles, preparation and exhibition of works, etc. Each of these activities will be evaluated and qualified, and the final mark will be the weighted average of those activities. This part represents 20% of the final grade of the subject and it is not required to attain a minimum mark to be weighted-averaged with the mark of theory.

**Final exam.** It will consist of 4-10 written response questions.

The subject will be passed with a weighted final mark  $\geq 5.00$ .

## Final remarks

1. "To be eligible for the retake process, the student should have been previously evaluated in a set of activities equaling at least two thirds of the final score of the course or module. Thus, the student will be graded as **Non-evaluable**" if the weighting of all conducted evaluation activities is less than 67% of the final score".

2. "Attendance to **practical sessions** (or field trips) is **mandatory**. Students missing more than 20% of programmed sessions will be graded as Non-Avaluable".

## Evaluation activities

| Title                           | Weighting | Hours | ECTS | Learning outcomes          |
|---------------------------------|-----------|-------|------|----------------------------|
| Evaluation of seminars/problems | 20%       | 6     | 0.24 | 6, 10, 8, 2, 7, 9, 11      |
| Exams of theory                 | 80%       | 4     | 0.16 | 6, 1, 2, 3, 5, 4, 7, 9, 11 |

## Bibliography

- **Silbernagl S, Despopoulos A.** Fisiología: Texto y Atlas. Editorial Médica Panamericana, 7th ed, 2009.
- **Hall JE.** Guyton y Hall: Tratado de Fisiología Médica. Elsevier, 13th ed, 2016.
- **Barrett KE, Barman SM, Boitano S, Brooks HL.** Ganong: Fisiología Médica. McGraw-Hill Lange, 25th ed, 2017.
- **Widmaier EP, Raff H, Strang KT.** Vander's Human Physiology: The Mechanisms of Body Function. McGraw-Hill Higher Education, 13th ed, 2013.
- **Fox SI.** Fisiología Humana. McGraw-Hill Educación, 13th ed, 2014.
- **Pocock G, Richards CD, Richards DA.** Human Physiology. Oxford University Press, 4th ed, 2013.
- **Tresguerres J.A.F.** Fisiología Humana. McGraw-Hill. 4th ed, 2010.
- **Tortora GJ, Derrickson BH.** Principles of Anatomy and Physiology. Wiley, 15th ed, 2017.
- **Koeppen BM, Stanton BA.** Berne & Levy Physiology. Elsevier, 7th ed, 2018.