

**Applied Physiology**

Code: 101908  
ECTS Credits: 6

Degree	Type	Year	Semester
2501230 Biomedical Sciences	OT	4	0

**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

**Prerequisites**

This subject does not have prerequisites, although it is advised that students have passed all subjects of the first  
It is advisable to have knowledge of English.

**Objectives and Contextualisation**

- To recognize and interpret from a physiological point of view practical situations of everyday life and laboratory :
    - Application of basic concepts of physiology to real and experimental situations
    - To recognize the importance that animal experimentation has in the development of biomedical research
    - Acquisition of basic concepts of biology and technology of experimental design
    - Acquisition of basic concepts of experimental design (animal experimentation)
- Critical validation of animal models in biomedical research.

## **Skills**

- 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.
- Contribute to public discussions on cultural matters.
- Develop critical thinking and reasoning and communicate ideas effectively, both in the mother tongue and in other languages.
- Develop independent learning habits and motivation to continue training at postgraduate level.
- Develop independent learning strategies.
- Generate innovative and competitive proposals for research and professional activities.
- Identify and understand the advances and challenges of research.
- Plan and implement laboratory analysis experiments and procedures belonging to the biomedical field.
- Respect diversity in ideas, people and situations.
- Work as part of a group with members of other professions, understanding their viewpoint and establishing a constructive collaboration.

## **Learning outcomes**

1. Contribute to public discussions on cultural matters.
2. Develop critical thinking and reasoning and communicate ideas effectively, both in the mother tongue and in other languages.
3. Develop independent learning habits and motivation to continue training at postgraduate level.
4. Develop independent learning strategies.
5. Generate innovative and competitive proposals for research and professional activities.
6. Identify and apply suitable functional study methodologies for the development of research projects.
7. Identify and critically evaluate methodologies for the experimental study of diseases.
8. Identify and understand the advances and challenges of research.
9. Respect diversity in ideas, people and situations.
10. Work as part of a group with members of other professions, understanding their viewpoint and establishing a constructive collaboration.

## **Content**

This subject is divided into two independent blocks:

Block 1 - Introduction to animal experimentation in biomedicine (approxim  
 - Ethics of animal experimentation. Basic legislation. Ethical committees  
 - Animal models in biomedicine - What is an animal model? Types of ani  
 - Types of experimental models according to their genetic and microbiolo  
 - Physiology of reproduction: Comparative reproduction of experimental a  
 - Physiological parameters of the experimental animal conditioning the e  
 - Animal welfare. Physiological needs and related factors.  
 - Basic experimental procedures. Administration and sampling. Anesthes  
 - Experimental design. General principles.

Block 2 - Applied medical physiology (approximately 14 hours of teaching)  
 Alterations of pulmonary mechanics. Surfactant. Functional respiratory te  
 Study of pulmonary and bronchial inflammation. Respiratory insufficiency  
 Pulmonary circulation. Heart lung relations.  
 Regulation of ventilation. clinical case  
 Intracavitary electrophysiology.  
 Adaptation to acute and chronic exercise.  
 Circulation Coronary.  
 Stress tests Methodology and applications.  
 Endothelial function  
 Nutrition and diet. Nutrition and cancer.  
 Croonophysiology  
 Aging.

Laboratory program

- DETERMINATION OF RAT OESTRUS CYCLE (mandatory)
- CARDIOVASCULAR MONITORING (voluntary).
  - Coronary Unit
  - Hemodynamic Unit
- MECHANICAL VENTILATION (voluntary).



## **Methodology**

- Theoretical classes. Based on presentations provided by the teacher and available prior to the classes.
  - Laboratory activities. Practical activities related to laboratory animal science. In order to attend laboratory practice sessions, the student must prove theoretical knowledge.
  - Oral presentations: Presentation and defense of an animal model and a research project.
  - Self-study - Time dedicated by the student to the study of both the material and the theoretical aspects.
  - Information search.

## Activities

Title	Hours	ECTS	Learning outcomes
<b>Type: Directed</b>			
Laboratory	3	0.12	2, 6
Lectures	33	1.32	6, 8, 7
Seminars - Oral presentations	3	0.12	1, 4, 2, 5, 6, 8, 7
<b>Type: Supervised</b>			
Tutorials for oral presentations	4	0.16	1, 5, 9, 10
<b>Type: Autonomous</b>			
Information analysis and preparation of the oral presentation	26	1.04	4, 3, 2, 5, 6, 8, 7, 9, 10
Literature search	9	0.36	4, 3, 8, 10
Study time	65	2.6	4, 3, 2, 6, 8, 7

## Evaluation

It is necessary to pass the two blocks of the subject with a grade  $\geq 5.0$  to pass the subject.

Block 1 - It is considered passed with a grade  $\geq 5.0$ . It is evaluated with 2  
 2.1 Examination of theoretical and practical knowledge, which may include  
 2.2 Oral presentation (couples) - Selection, presentation and defense of

Block 2 - Review of theoretical knowledge that will include two sub-tests:

The final grade is obtained as the compensated average of the two block  
 Students with a grade  $< 5.0$  will be eligible for a recovery exam for the fail  
 A student will be considered "not evaluable" when he/she has taken less

## Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Presentation Block 1	35 %	3	0.12	1, 4, 3, 2, 5, 6, 8, 7, 9, 10
Reasoning test - Block 2	25 %	1	0.04	1, 4, 3, 2, 5, 6, 8, 7, 9, 10
Test Part 1 (with laboratory)	15 %	2	0.08	2, 5, 6, 8, 7
Test Part 2	25 %	1	0.04	1, 2, 5, 6, 8, 7

## Bibliography

Ciencia y Tecnología del Animal de Laboratorio. Textos Universitarios, UAH, 2008.

Journal on line: JoVE (Journal of Visualized Experiments) - <http://www.jove.com/>

Additional bibliographic support will be provided during the course, a part from the student's autonomous search of references.