

**Animal Physiology**

Code: 100898  
ECTS Credits: 6

**2025/2026**

Degree	Type	Year
Biochemistry	FB	2

## Contact

Name: Merce Giralt Carbonell

Email: merce.giralt@uab.cat

## Teachers

Francisco Javier Carrasco Trancoso

## Teaching groups languages

You can view this information at the [end](#) of this document.

## Prerequisites

Basic skills and knowledge of the subjects of Biochemistry, Cell Biology and Histology

## Objectives and Contextualisation

Learn the basics of physiology of different functional systems of the body animal and regulatory systems.

- Acquire a complete and integrated view of the interrelationships of the \
- Integrate the knowledge of the physiology acquired in other core subjec
- To train students to apply knowledge in physiological deduction of the c

## Learning Outcomes

1. CM14 (Competence) Interpret experimental results regarding physiological processes at the molecular level in animals and plants, with particular emphasis on the nervous and endocrine systems.
2. CM15 (Competence) Use physiological data to assess the existence of gender/sex-based inequalities in various parameters, such as haemoglobin.
3. KM19 (Knowledge) Describe the different cell types present in animals and plants at a structural, physiological and biochemical level.
4. SM15 (Skill) Analyse the role of hormones, neurotransmitters, and growth factors in the regulation of gene expression and metabolism.
5. SM16 (Skill) Interpret experimental results from studies of molecular-level physiological processes.

## Content

The program to be followed will be as follows, unless the requirements enforced by the health authorities demand a prioritization or reduction of these contents.

### PROGRAM THEORY

1-Introduction to Animal Physiology:

- Brief history of animal physiology.

- Basic principles of physiology. Internal environment and homeostasis. Feedback mechanisms (feedback).

Compartments liquid composition. Transport through the membrane. Communication intercellular.

2. Excitability and excitable cells:

- Concept and excitability excitable cells.
- The nervous system: neurons and glia
- Electrical activity in neurons: ion channels. Ionic basis of resting membrane potential and action potentials. Nerv
- Synapse. Basics of Neurochemistry. Neurotransmission.
- Synaptic integration.

### 3. Nervous System

- Anatomical organization of the nervous system. Development of the nervous system
- Protective Structures of the nervous system: bone structure. Meninges. Cerebrospinal fluid.

BHE.

- Structural central nervous system: cerebral hemispheres: histological structure of the cerebral cortex.

Functional organization of the cortex. Basal ganglia. Hippocampus. Amygdala.

- Functional organization of structures diencephalic, mesencephalic and brainstem.
- Spinal cord

### 4. Sensory Physiology:

- Sensory receptors. Concept. Type. Transduction mechanisms.
- Somatosensory receptors. Touch and pressure. Thermoreceptors. Nociception. Pathways processing somatose
- Special Senses. Chemoreception: smell and taste.
- Photoreception: the human eye
- Hearing and equilibrium: human ear.

### 5. The autonomic nervous system

- Sympathetic and parasympathetic

## 6. Somatic motor system

- Organization cord. Muscle organs and spinal reflexes.
- Organization supramedular. The role of the cerebral cortex, cerebellum and basal ganglia

## 7. Activation SNC:

- Reticular system. Wakefulness and sleep. Electroencephalogram.

## 8. Endocrine system

- Hormones. Mechanisms of action. Regulatory systems.
- The pituitary: Neurohypophysis. Neurohypophysis hormones. Adenohypophysis. Adenohypophysis hormones. (
- Adrenal Glands: adrenocortical tissue: Glucocorticoids. Mineralocorticoid. Chromaffin tissue: Catecholamines
- The thyroid gland. Synthesis and function of thyroid hormones.
- Pancreatic hormones. Insulin and glucagon.
- The metabolism of calcium and phosphorus. Parathyroid hormone, vitamin D and calcitonin

## 9. Muscle Physiology

- Type of muscle tissues: anatomical and functional characteristics.
- Striated skeletal muscle
- Cardiac muscle
- Visceral smooth muscle

## 10. Circulatory System:

- Elements of blood forms. Hemostasis.
- Concepts of hemodynamics. Functional organization of the circulatory system.
- Functional structure of the heart, electrical and mechanical events during the cardiac cycle. Electrocardiogram.

- Arterial, venous. Blood pressure. Capillary exchange.

- Control of the cardiovascular system.

- Lymphatic System

#### 11. Respiratory Physiology:

- Functional anatomy of the respiratory system. The lungs of mammals. Functional structure. Exchange gases.

- Regulation of respiration in mammals.

#### 12. Renal Physiology:

- The mammalian kidney. Functional anatomy. Processes involved in the formation of urine. Formation of urine c

#### 13. Digestive:

- Anatomy and function of the digestive system in mammals. Gastrointestinal regulatory systems: enteric nervous

- Mouth and esophagus: saliva and swallowing

- Stomach

- Small intestine: Pancreatic Secretion. Bile secretion. Chemical digestion. Absorption. Entero-hepatic circulation

- Large intestine: digestion mechanical and chemical. Absorption. Formation of feces. Defecation

#### 14. Control of body temperature

#### 15. Reproduction:

- Testicular function. Control of male reproductive functions

- The ovarian function. The endometrial and ovarian cycle. Player control in the female.

### Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
-------	-------	------	-------------------

Type: Directed			
seminars and problems	9	0.36	CM14, CM15, KM19, SM15, SM16, CM14
Theoretical lectures	39	1.56	CM14, CM15, KM19, SM15, SM16, CM14
Type: Supervised			
problems resolution	2	0.08	CM14, CM15, KM19, SM15, SM16, CM14
seminars preparation	6	0.24	CM14, CM15, KM19, SM15, SM16, CM14
Type: Autonomous			
problem resolution	10	0.4	CM14, CM15, KM19, SM15, SM16, CM14
study	60	2.4	CM14, CM15, KM19, SM15, SM16, CM14
work preparation	10	0.4	CM14, CM15, KM19, SM15, SM16, CM14

## Methodology

### Theoretical lectures:

Traditional lectures on the contents of the theoretical program imparted by the professor with the support of images obtained mainly from the bibliography that is recommended to the student.

### Seminars:

The student works in small groups.

1.-SEMINARS OF CASES AND PROBLEMS (3 hours): discussion and resolution of practical cases and problems

2.-SEMINARS OF THEMES (3 + 3 hours): Students prepare a topic chosen by them, from the list of topics proposed by the teacher. The students will present a written summary (maximum 2 sheets) and at the end, an oral presentation (maximum 15 minutes).

All the students of the group must participate in the written and oral presentation.

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.

## **Assessment**

### **Continous Assessment Activities**

Title	Weighting	Hours	ECTS	Learning Outcomes
Cases, problems and work: written / oral	25%	6	0.24	KM19, SM16
Written exam of theoretical knowledge	75%	8	0.32	CM14, CM15, KM19, SM15, SM16

## Evaluation

According to current regulations, the continuous evaluation process must include a minimum of three evaluation activities, of two different types, distributed throughout the course, none of which can represent more than 50% of the final grade.

In this subject, the assessment includes 5 assessment activities: three theoretical and two seminars and 3 typologies: written tests, work assignments and oral defense of the work. Below we will detail this evaluation process.

### 1.- Evaluation of the theory: 75% of the final grade

The theoretical knowledge will be evaluated by means of three partial exams. The value of each partial will be proportional to the amount of matter evaluated.

1.1.- Theoretical exams: partial: Will be multiple-choice examination, of 4 possible answers, a single correct answer.

To pass by partial the minimum mark of each partial will have to be  $\geq$  of 4.3 and the final grade of theory after making the half between the three partials (proportional according to the subject) will have to be  $\geq$  5. Otherwise, there will be to go to recovery of the suspended partials. If partials exceed 4.3 but do not reach 5 score, the student can choose the/those partial to recover.

1.2.- Theoretical test: Recovery: 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 qualification of the student. Therefore, students will obtain the "Non-gravable" qualification when the assessment activities carried out have a weighting of less than 67% in the final grade.

There is a recovery test for each partial suspended. The recovery exam, consists of 2-4 short questions to be developed and 10-14 true or false and reason the answer.

1.3.- Theoretical test: To improve the final grade: There is the possibility of a special exam to improve the final grade. The exam is of all theoretical course (you cannot exam of only one of the two partial) the same day of the recovery.

### 2.- Evaluation of the seminars: 25% of the final grade (problems 10% - subjects 15%)

In the seminars students work in groups (4-5) that are organized at the beginning of the course.

2.1.-Case and problem seminars: They will be two: one half-semester and the other at the end. Written tests

2.2.- Seminars of subjects: (3 + 3)

A: delivery of written report: summary of a chosen subject (5%)

B: Oral defense of the work (5%)

C: Written exam on all seminars presented in the current course (5%) with multiple-choice examination (one question per seminar)

The seminars will not be recoverable

3. Single evaluation: consists of a THEORY Exam. Seminars are valued in the same way as continuous evaluation.

Evaluation of the theory: a single test in which the contents of the entire theory program of the subject will be evaluated. The test will consist of multiple-choice questions (80%), and a topic question to be developed (20%). The grade obtained in this synthesis test will represent 75% of the final grade of the subject.

4. General considerations on evaluation: In the preparation of the seminar part by topic, a restricted use of Artificial Intelligence (AI) is allowed exclusively in: support tasks, such as bibliographic or information search,

and text correction or translations. The students will have to clearly identify which parts have been generated with this technology, specify the tools used and include a critical reflection on how they have influenced the process and the final result of the activity. Failure to be transparent about the use of AI in this assessable activity will be considered a lack of academic honesty and may result in a partial or total penalty in the grade of the activity, or greater penalties in cases of seriousness.

## **Bibliography**

### Bibliografía de Fisiología

- Guyton y Hall. Repaso de fisiología médica; 2021
- Koeppen Bruce M. Berne y Levy. Fisiología; 2018
- Hall, John. Guyton & Hall, Tratado de Fisiología médica; 2021
- Tortora, G.J. Principios de anatomía y fisiología; 2018
- FOX, S.I. Fisiología Humana. McGraw-Hill Interamericana 2021
- GANONG, W.F. Fisiología médica. 22a ed. El Manual Moderno.. 2006
- MARTIN CUENCA E, Fundamentos de Fisiología Thomson 2006
- MOYES, C.D SCHULTE, P.M. Principios de Fisiología Animal. Pearson 2007
- POCOCK,G.; RICHARDS C.D. Fisiología humana. Masson 2001.
- VANDER, SHERMAN, LUCIANO. Fisiología Humana. McGraw-Hill 1999

### Fisiología Animal i comparada

- HILL, R.W., CAVANAUGH D.J., ANDERSON M. Animal Physiology. NY:OXFORD UNIVERSITY PRESS. 2022

### Versions electròniques de llibres de Fisiologia:

Autor Jesús A. Fernández-Tresguerres ... [et al.]

Títol - Fisiología humana [Recurs electrònic]

Edició 4a ed

Publicació - México, [etc.] : McGraw-Hill Interamericana, cop. 2014

[https://bibcercador.uab.cat/permalink/34CSUC\\_UAB/cugbhl/alma991010526756806709](https://bibcercador.uab.cat/permalink/34CSUC_UAB/cugbhl/alma991010526756806709)

Autor Silverthorn, Dee Unglaub, 1948-

Títol Fisiología humana [Recurs electrònic] : un enfoque integrado / Dee Unglaub Silverthorn, con colaboración de Bruce R. Johnson y William C. Ober

Edició 6a ed.

Publicació/producció Buenos Aires [etc.] : Médica Panamericana, cop. 2014

[https://bibcercador.uab.cat/permalink/34CSUC\\_UAB/cugbhl/alma991005455529706709](https://bibcercador.uab.cat/permalink/34CSUC_UAB/cugbhl/alma991005455529706709)

## Software

No software is used

## Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	321	Catalan/Spanish	second semester	morning-mixed
(SEM) Seminars	321	Catalan/Spanish	second semester	morning-mixed
(SEM) Seminars	322	Catalan/Spanish	second semester	afternoon
(TE) Theory	32	Catalan	second semester	afternoon