

Degree	Type	Year
Biology	OB	3

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Teachers

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Teaching groups languages

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

Prerequisites

It is convenient that the student has reached basic knowledge and competences of Biochemistry, Cell Biology, Histology and Animal Physiology (systems).

Objectives and Contextualisation

The subject of Physiology: Neurophysiology and Endocrinology is programmed during the first semester of the second year of the Degree in Biology and develops the integrated knowledge of the endocrine system and the normal functioning of the nervous system. Particular emphasis is placed on the mammalian nervous system.

The acquisition of the basic competences of the subject will allow the student to face with a sufficient base the study of the physiopathology and the understanding of the mechanisms that affect the endocrine and nervous systems of animals and humans.

The general formative objectives of the subject are:

- Know the anatomical organization of the nervous system.
- Identify the different cell types that make up nervous tissue.
- Learn the basic concepts of the physiology of the nervous system in health.
- Identify the circuits and mechanisms responsible for the main neural, motor, sensory and cognitive functions.
- Train the student to apply the knowledge acquired in the deduction of the consequences of the pathological alterations of the endocrine and nervous system.
- Acquire the necessary practical skills to perform frequent functional techniques in the endocrine and nervous fields.

Competences

- Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.
- Apply statistical and computer resources to the interpretation of data.
- Be able to analyse and synthesise
- Be able to organise and plan.
- Carry out functional tests and determine, assess and interpret vital parameters.
- Control processes and provide services related to biology.
- Design and carry out biodiagnoses and identify and use bioindicators.
- Make changes to methods and processes in the area of knowledge in order to provide innovative responses to society's needs and demands.
- 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.
- Take sex- or gender-based inequalities into consideration when operating within one's own area of knowledge.
- Understand and interpret the physicochemical bases of the basic processes of living beings
- Understand the processes that determine the functioning of living beings in each of their levels of organisation.

Learning Outcomes

1. Analyse a situation and identify its points for improvement.
2. Analyse the sex- or gender-based inequalities and the gender biases present in one's own area of knowledge.
3. Apply statistical and computer resources to the interpretation of data.
4. Be able to analyse and synthesise.
5. Be able to organise and plan.
6. Carry out functional tests and determine, assess and interpret vital parameters in animals.
7. Critically analyse the principles, values and procedures that govern the exercise of the profession.

8. Gain further understanding of electric phenomena and of signal transmission to excitable cells.
9. Gain further understanding of the functional mechanisms of hydrosaline and acid-base balance in the animal organism.
10. Identify, enumerate, describe, interpret and explain the analysis protocols applied to studies of a physiological nature.
11. Identify, enumerate, describe, interpret, explain and apply the rules on laboratory practice covering studies of a physiological nature.
12. Identify, enumerate, describe, interpret, explain and summarise the different levels of organisation of animals.
13. Identify, enumerate, describe, interpret, explain and summarise the function and regulatory mechanisms of the animal reproductive system.
14. Identify, enumerate, describe, interpret, explain and summarise the functional organisation of animal organs and systems.
15. Identify, enumerate, describe, interpret, explain and summarise the functional mechanisms of animal nutrition and metabolism.
16. Identify, enumerate, describe, interpret, explain and summarise the fundamental principles of the concept of homeostasis.
17. Identify, enumerate, describe, interpret, explain and summarise the physiological bases of adaptation to the environment.
18. Identify, enumerate, describe, interpret, explain and summarise the physiological bases of pathological processes.
19. Identify, enumerate, describe, interpret, explain and summarise the structure and functioning of the endocrine system.
20. Identify, enumerate, describe, interpret, explain and summarise the structure and functioning of the nervous system.
21. Identify, enumerate, select, describe, interpret, explain and summarise the practical skills needed to apply diagnosis techniques and decide on the use of bioindicators.
22. Identify, enumerate, select, describe, interpret, explain and summarise the practical skills needed to apply the most common functional study techniques.
23. Propose new methods or well-founded alternative solutions.
24. Propose projects and actions that incorporate the gender perspective.
25. 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.
26. 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.
27. Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
28. Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.
29. 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.
30. Take account of social, economic and environmental impacts when operating within one's own area of knowledge.
31. Work in teams.

Content

Theoretical program of the subject

I.- Nervous System

Introduction to the nervous system:

- Cell biology of the neuron.

- Nerve cells: neurons and glia.
- Synapses and Neurotransmission.
- Neurochemistry.
- Concepts of Neural Integration and Neural Integration.

Anatomical organization of the nervous system:

- General anatomy of the nervous system. Blood-brain barrier. Cerebrospinal fluid.
- Histological structure of the cerebral cortex. Functional organization of the cortex.

Sensory physiology:

- Sensory receptors. Concept. Types. Transduction mechanisms.
- Somatosensory information. Touch and pressure receptors. Balance receptors. Pain.
- Phonoreception and human hearing.
- Photoreception and the human eye
- Chemoreception: Taste and smell.

States of activation of the nervous system. Emotion and motivation:

- CNS activation states. Electroencephalogram. The reticular system. Wakefulness and sleep.
- Emotion and motivation. Concepts. The role of the limbic system and hypothalamus.

Motor system:

- Vegetative nervous system. Sympathetic and parasympathetic.
- Somatic motor system: spinal cord organization. Sensory organs of the muscle. The organization of muscle movements.
- Somatic motor system: supramedullary organization. Role of the cerebral cortex, basal ganglia and cerebellum. Vestibular function and balance.
- Higher functions of the SN:

Memory and learning.

II.- Endocrine System and Reproduction:

- Endocrine glands and hormones.
- Hypothalamic-pituitary functional unit. Hypothalamic control of pituitary function.
- The pituitary gland: Neurohypophysis. Neopituitary hormones. Pars intermedia. Adenohypophysis. Adenohypophyseal hormones. GH and prolactin.
- Pancreatic hormones. Insulin and Glucagon.
- The thyroid gland. Synthesis and Function of Thyroid Hormones
- Calcium and phosphorus metabolism. Parathormona, Vitamin D and calcitonin.
- Adrenal gland: Adrenocortical tissue: Glucocorticoids. Mineralocorticoids. Androgens

adernals. Chromaffin tissue: Catecholamines.

- Testicular function. Control of male reproductive functions

- Ovarian function. The ovarian cycle. Reproductive control in the female.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Laboratory Practices	12	0.48	30, 7, 2, 1, 3, 8, 9, 6, 11, 12, 16, 15, 13, 17, 18, 19, 20, 14, 10, 21, 22, 23, 24, 29, 28, 27, 25, 26, 4, 5, 31
Seminars	7	0.28	30, 7, 2, 1, 8, 9, 12, 16, 15, 13, 17, 18, 19, 20, 14, 24, 29, 28, 27, 25, 26, 4, 5, 31
Theoretical classes	32	1.28	30, 7, 2, 8, 9, 12, 16, 15, 13, 17, 18, 19, 20, 14, 21, 22, 24, 29, 28, 27, 25, 26, 5
Type: Supervised			
Tutorials	5	0.2	29, 28, 27, 25, 26
Type: Autonomous			
Problem resolution and analysis of data	10	0.4	30, 7, 2, 1, 3, 8, 9, 6, 11, 12, 16, 17, 18, 19, 20, 14, 10, 21, 22, 23, 29, 28, 27, 25, 26, 4, 5, 31
Study	78	3.12	30, 7, 2, 8, 9, 12, 16, 15, 13, 17, 18, 19, 20, 14, 24, 29, 28, 27, 25, 26, 4

Methodology

Theoretical classes:

Systematized exposition of the subject syllabus, giving relevance to the most important concepts. The student acquires the basic scientific knowledge of the subject by attending theory classes, which will be complemented with the personal study of the topics presented.

Seminars:

The knowledge acquired in the theory classes and with personal study will be reinforced with the seminars, carrying out written tests for discussion and resolution of practical cases and problems that must be solved in a group. These proofs are assessable and are not recoverable. Non-attendance (to 1 or more of them) will be considered a zero of the seminar not presented.

Practical classes:

Practical sessions for the observation and performance of neuroanatomical, neurohistological and behavioural techniques. It promotes group work and active learning.

Attendance at the practical sessions is mandatory. Students will obtain the grade of "Not Assessed" when their absence is greater than 20% of the scheduled sessions.

Note: 15 minutes of a class will be reserved, within the calendar established by the centre/degree, for the complementation by the students of the surveys for the evaluation of the performance of the teaching staff and the evaluation of the subject/module.

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
practical exam	15%	0.5	0.02	30, 7, 2, 1, 3, 8, 9, 6, 11, 12, 16, 15, 13, 17, 18, 19, 20, 14, 10, 21, 22, 23, 24, 29, 28, 27, 25, 26, 4, 5, 31
Seminars	15%	1.5	0.06	30, 7, 2, 1, 3, 8, 9, 6, 11, 12, 16, 15, 13, 17, 18, 19, 20, 14, 10, 21, 22, 23, 24, 29, 28, 27, 25, 26, 4, 5, 31
Theoretical classes	70%	4	0.16	30, 7, 2, 1, 3, 8, 9, 6, 11, 12, 16, 15, 13, 17, 18, 19, 20, 14, 10, 21, 22, 23, 24, 29, 28, 27, 25, 4, 5, 31

Evaluation

The competencies of this subject will be assessed by:

Theory: 70% of the final grade:

Written evaluation. Theoretical knowledge will be assessed in three partial stages. The value of each partial will be proportional to the amount of subject evaluated (20-25% each partial).

The theory note corresponds to the part of the nervous system (two partials) and the part of the endocrine system (one partial). To pass by partials, a minimum grade of 4.5 is required for each of these exams to average with the seminars and internships.

There is a make-up exam for each failed midterm.

Seminars: 15% of the final grade:

Written evaluation. Discussion and resolution of cases and problems. 7 seminars. Seminars are not recoverable.

Internship: 15% of the final grade:

Single and individual written evaluation at the end of all the practices, on the same day as the theory exam of the 2nd part. There is no minimum grade at this part to average the marks of theory and seminars, but in practice grades lower than 4, there will be the possibility of taking an exam to recover the practices.

Recovery: To participate in the retake, students must have previously been evaluated in a set of activities whose weight is equivalent to a minimum of two thirds of the total grade of the subject or module. Therefore, students will obtain the grade of "Not Assessed" when the evaluation activities carried out have a weighting of less than 67% in the final grade.

To improve grade: There is the possibility of a special exam to improve grade. The exam is for the whole subject (you cannot take the exam to improve only one midterm grade) on the same day of the recovery.

In the case of requesting the single evaluation, students may take a single Final Exam of the theory that will include all the contents of the subject and will have a weight of 70% of the grade. This test will be held on the same day that the rest of the registered people take the 3rd partial of theory. The part of seminars and practices (30% of the final grade) must be done like the rest of the students.

As mentioned above, the grade of "Not Assessable" will be received when the set of evaluation activities carried out has a weight of less than 67% of the final grade.

Bibliography

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GUYTON AC, HALL JE. *Tratado de Fisiología Médica* (13 ed.), Elsevier, 2016.

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TRESGUERRES J.A.F. et al. *Tratado de endocrinología básica y clínica. Volumen I i II Ed.* Síntesis 2001

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(*) Electronic access

Software

We do not use any software

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
(PLAB) Practical laboratories	131	Catalan/Spanish	first semester	afternoon
(PLAB) Practical laboratories	132	Catalan/Spanish	first semester	afternoon
(PLAB) Practical laboratories	133	Catalan/Spanish	first semester	afternoon
(PLAB) Practical laboratories	134	Catalan/Spanish	first semester	afternoon
(SEM) Seminars	131	Catalan	first semester	morning-mixed
(SEM) Seminars	132	Catalan	first semester	morning-mixed

(SEM) Seminars	133	Catalan	first semester	morning-mixed
(TE) Theory	13	Catalan	first semester	morning-mixed