Physiological Psychology I

Code: 102547
ECTS Credits: 6

2024/2025

Degree	Type	Year
2502443 Psychology	OB	2

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Teaching groups languages

You can view this information at the end of this document.

Prerequisites

There are no prerequisites, but the knowledge acquired in the first-year of Degree in Psychology (Foundations of Psychobiology I, II) is assumed. It is advisable to have knowledge of English.

Objectives and Contextualisation

This subject, which is compulsory in the UAB's Degree in Psychology, is taught in the first semester of the second academic year, after having completed the subjects Foundations of Psychobiology I and II. The basic knowledge of genetics, neurophysiology, neurochemistry and functional neuroanatomy, studied in the previous subjects, will be considered completed.

Physiological Psychology has a multidisciplinary nature since it requires the knowledge of many scientific fields, mainly psychology, biology and biochemistry. The general objective of the subject is to gain the knowledge of the biological bases of the following processes: consciousness, perception of sensory stimuli and planning and execution of motor behaviour.

By the end of the course, the students will be able to:

1. Describe the main neuroanatomical and neurophysiological characteristics of perceptual (somesthesis, vision, hearing, taste, smell) and sensorimotor processes.
2. Describe the biological basis of consciousness.
3. Explain how the brain analyzes and processes information from the environment through mental representations, plans behavior, and develops a response.
4. Describe and interpret graphs and results of neuroscientific articles.
5. Present and discuss applied topics related to the content of the subject.

Competences

- Analyse scientific texts written in English.
- Identify, describe and relate the biology of human behaviour and psychological functions.
- Identify, describe and relate the structures and processes involved in basic psychological functions.
- Maintain a favourable attitude towards the permanent updating through critical evaluation of scientific documentation, taking into account its origin, situating it in an epistemological framework and identifying and contrasting its contributions in relation to the available disciplinary knowledge.
- 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.
- Use different ICTs for different purposes.
- Work in a team.

Learning Outcomes

1. Analyse scientific texts written in English.
2. Describe the alterations in sensory-perceptive processes in relation to the changes in the underlying neurophysiological and neurohormonal mechanisms.
3. Describe the neuronal circuits, the neurophysiological, neurochemical and hormonal mechanisms involved in language and consciousness.
4. Describe the neuronal circuits, the neurophysiological, neurochemical and hormonal mechanisms involved in sensory-perceptual processes (somesthesia, vision, hearing, balance, taste and smell) and sensory-motors.
5. Evaluate the contributions of a psychobiological approach to advancing the understanding of the neurobiological basis of language and consciousness.
6. Evaluate the contributions of a psychobiological approach to advancing understanding of sensory-perceptual processes (somesthesia, vision, hearing, balance, taste and smell) and sensory-motors.
7. Identify the main authors and their scientific contributions to the development of knowledge in the area of neurosciences in general and physiological psychology in particular from a historical perspective.
8. Maintain a favourable attitude towards the permanent updating through critical evaluation of scientific documentation, taking into account its origin, situating it in an epistemological framework and identifying and contrasting its contributions in relation to the available disciplinary knowledge.
9. Recognised the main methods and techniques for research in physiological psychology.
10. Relate neuroanatomical, neurophysiological and neurohormonal alterations with disorders of sensory-perceptual processes (somesthesia, vision, hearing, balance, taste and smell) and sensory-motors.

11. Relate neuroanatomical, neurophysiological, neurohormonal and genetic alterations with language disorders.
12. Relate somesthesia, vision, audition, balance, taste and smell with their neuronal bases and the neurophysiological, hormonal and genetic underlying mechanisms.
13. 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.
14. 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.
15. Use different ICTs for different purposes.
16. Work in a team.

Content

Unit 1. Sensation and Perception
1. Mind, consciousness, and perception
2. General principles of sensory processing

Unit 2. Body Senses
1. Somatosenses
2. Receptors, somesthetic pathways and transduction
3. Analysis of somatic information in the cerebral cortex
4. Pain and analgesia

Unit 3. Vision
1. The stimulus: light
2. The eye, the retina, and the optical pathways
3. Transduction and encoding of the retinal visual information
4. Analysis of visual information: striate cortex
5. Analysis of the visual information: associative visual cortices

Unit 4. Audition
1. The stimulus: sound
2. Anatomy of the ear
3. Transduction and encoding of auditory information in the cochlea
4. Analysis of auditory information in the central nervous system

Unit 5. Chemical senses: Taste and Smell
1. Gustation
2. Olfaction

Unit 6. Control of Movement
1. Organization of the senso-motor function
2. Skeletal muscle
3. Control of movement by the spinal cord
4. Control of movement by the brain

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Master classes with ICT support and questions for debate	28.5	1.14	3, 4, 2, 9, 12, 10, 11, 5, 6

Seminars (12h) and Workshops (4h)	16	0.64	1, 2, 8, 12, 16, 15
Type: Supervised			
Tutorials On line and one to one	8.5	0.34	16, 15
Type: Autonomous			
Comprenhesive reading of materials	20	0.8	1, 2, 8, 12, 15
Documentation	11	0.44	1, 8, 15
Exercices and activities	20	0.8	3, 4, 2, 14, 9, 12, 10, 11, 5, 6
Study of basic concepts of the subject	30	1.2	1, 3, 4, 2, 8, 9, 12, 10, 11, 5, 6
Team project to cretae an oral presentation	12	0.48	1, 8, 13, 16, 15

DIRECTED ACTIVITY (30%)

a) Master Classes (TE) (whole group). 19 face-to-face sessions (1.5h) of work based on:

- Master or flipped classroon with the support of information thechnologies (ICTs) and proposal of questions to discuss and debate through the active participation of students.
- Practical exercises and problem-solving tasks, both individually and in groups
- Viewing and discussion of short videos

b) Seminars (PAUL). 6 face-to-face seminars (2h), usually in groups, based on:

- Cooperative work
- Reading of texts and articles to facilitate the understanding of the teaching content.
- Practical exercises and self-assessment.
- Problem-solving activities and debates on different issues.
- Presentation and discussion of group work.

C) Workshops (PLAB). 2 sessions (2h)

- Workshop on anatomy and physiology of the visual system through models of the sensory organs and practical exercises.
- Workshop on chemical senses (taste and smell) through models of the sensory organs and practical exercises.

SUPERVISED ACTIVITY (5%). Follow-up, in person or virtually, with the lecturing staff individually and/or in a group. The key aspects of this supervised activity include:

- Correcting and providing guidance on answering key questions from the syllabus.
- Facilitating reflections on the assigned readings.
- Addressing any doubts or questions that may arise.
- Providing guidance and direction for group work (EV3).
- Offering personalized study strategies to enhance individual learning.

AUTONOMOUS ACTIVITY (60%).

- Documentation.
- Comprehensive reading of materials (books, scientific papers, outreach articles, webs).
- Studyof basic concepts of the subject (conceptual maps, synthesis).
- Team project to create an oral presentation and discussion.
- Exercises and activities for continuous evaluation and self-evaluation.

- Regular participation in communication forums, and other spaces of the virtual classroom, coordinated by the lecturing staff.

ASSESSMENT ACTIVITY (5%)

- Individual written tests (multiple-choice, open questions or practical exercises)(EV1 and EV2)
- Oral presentation and written abstract (EV3)
- Tasks and activities (carried out in class or at home) (EV4)

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
EV1. Written individual test of open questions and/or short questions.	40	2	0.08	4, 2, 7, 9, 12, 10, 5, 6
EV2. Written individual test of open questions and/or short questions.	40	2	0.08	3, 4, 2, 7, 9, 12, 10, 11, 6
EV3. Team-work: short oral presentation, discussion, and written abstract.	20	0	0	1, 4, 8, 14, 10, 15, 6
EV4. Exercises and tasks, carried out in class or at home.	5	0	0	1, 4, 8, 13, 12, 10, 16, 15, 6

The evaluation of the subject is based on a continuous assessment through different tests and activities in which the students will have to demonstrate that they have achieved the corresponding competences and learning outcomes.

For each of the following evaluation activities, its weight in the final grade, the duration of the test and when it is carried out are indicated:

- EV1. Learning Evidence 1 (compulsory): Written individual test (multiple-choice, open questions and/or short questions). Topics covered in master, seminar and workshop classes on Units 1, 2 and 3 (40% of final grade, 1.5h, first evaluation period).
- EV2. Learning Evidence 2 (compulsory): Written individual test (multiple-choice, open questions and/or short questions). Topics covered in master, seminar and workshop classes on Units 4, 5 and 6 (40% of final grade, 1.5h, second evaluation period).
- EV3. Learning Evidence 3 (optional): Brief presentation (oral or video), followed by an oral debate-defense and submission of a written summary on a work carried out cooperatively in a group, based on the explanation and discussion of recent neuroscientific articles (20%; approximately 10-15 minutes of presentation + 5-10 minutes of debate; seminars 5 and 6).
- EV4. Learning Evidence 4 (optional): Exercises and tasks to be completed either in class or at home (5% of final grade).

The subject provides the option of a single assessment, which entails renouncing continuous evaluation and requires submitting the mandatory evidence EV1 and EV2 on a single date. If the optional evidences (EV3 and EV4) are chosen, they must also be submitted on the same date. The description, weight and duration of the

evidence are identical to those explained in sections 1- 4 above. The date of completion and submission will correspond to the date of the second evaluation period. The same re-assessment process used in continuous evaluation will be applied (see next section "e").

Theevaluation criteria will be the following:

a) Provision of compulsory learning evidences, EV1 and EV2.

b) Students providing learning evidences with a weight equal to or greater than 40% will be considered evaluable.

c) The final grade will be calculated based on the weighted average of all the assessment activities carried out.

d) To pass the subject, a weighted average (of all provided evidences) equal to or greater than 5 points out of 10 is required, with a minimum of 3.5 points in each of the 2 compulsory evidences (EV1 and EV2). Otherwise, the maximum grade in the course will be 4.5.

e) Students who have completed the compulsory evidences (EV1 and EV2) but obtained a continuous assessment grade (EV1 + EV2 + EV3 + EV4) below 5 points and equal to or greater than 3.5 points out of 10 will be eligible to take are-assessment test. The test will involve repeating one or both of the compulsory learning evidences, typically the one with the lower grade. The passing criterion for the re-assessment will be the same as in section d, replacing the grade of the recovered evidence. If the subject is passed in the re-assessment, the maximum possible numerical mark will be 7 out of 10.

Link to the Evaluation Guidelines of the Faculty of Psychology

Bibliography

In bold the basic bibliography (choose one of the reference manuals). The rest of the bibliography is complementary.

- Bear, Mark F.; Connors Barry W.; Paradiso Michael A. (2020). Neuroscience: Exploring the brain (Enhanced Edition). Jones & Barlett Learning.
- Carlson Neil R.; Birkett, Melissa A. (2023). Physiology of Behavior (13th edition). Pearson
- Carlson Neil R.; Birkett, Melissa A. (2017). Physiology of Behavior (12th edition). Pearson (online version: https://ebookcentral.proquest.com/lib/uab/reader.action?docID=5186462).
- Carlson Neil R.; Birkett, Melissa A. (2018). Physiology of behavior (12th edition). Madrid: Pearson.
- Garret, Bob; Hough, Gerald (2022). Brain and Behavior (6th Edition). Sage Publications Inc.
- Morgado Bernal, Ignacio (2019) Los sentidos: cómo percibimos el mundo (The senses: how we perceive the world). Barcelona: Ariel.
- Morgado, Ignacio (2023) La mente humana. Barcelona: Ariel

Software

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Language list

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	11	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	12	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	21	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	22	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	31	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	32	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	41	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	42	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	51	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	52	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	111	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	112	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	113	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	114	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	211	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	212	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	213	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	214	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	311	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	312	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	313	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	314	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	411	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	412	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	413	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	414	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	511	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	512	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	513	Catalan	first semester	morning-mixed
(TE) Theory	1	Catalan	first semester	morning-mixed

(TE) Theory	2	Catalan	first semester	morning-mixed
(TE) Theory	3	Catalan	first semester	morning-mixed
(TE) Theory	4	Catalan	first semester	morning-mixed
(TE) Theory	5	Catalan	first semester	morning-mixed