

**Psychobiology**

Code: 101900  
ECTS Credits: 6

Degree	Type	Year	Semester
2501230 Biomedical Sciences	OT	4	0

**Contact**

Name: María del Pilar Segura Torres  
Email: Pilar.Segura@uab.cat

**Use of Languages**

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

**Teachers**

Laura Aldavert Vera  
Margarita Martí Nicolovius  
Ignacio Morgado Bernal  
Marta Portero Tresserra  
Carles Soriano Mas

**Prerequisites**

No requirements are specified

**Objectives and Contextualisation**

This subject, which is compulsory in the UAB's Degree in Psychology, is taught in the second semester of the second year, after having completed the subjects Foundations of Psychobiology I and II, as well as Physiological Psychology I in the first semester of the second year.

The general objective of the subject is learn about the biological bases of sleep and waking, motivated behaviours, emotions, and learning and memory processes.

At the end of the course, students will be able to do the following.

1. Describe the neurobiological bases of sleep and waking, sleep functions and some disorders of sleep.
2. Explain the neurobiological bases and the functions of the reward system, and identify the neurobiological changes underlying addiction.
3. Describe the neural and hormonal control of different motivated behaviours such as ingestive behavior and sexual and parental behaviours.
4. Explain the neurobiological bases of emotions and their functions.
5. Describe the neurobiological bases of the learning and memory processes.

## Competences

- 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.
- Develop scientific knowledge, critical reasoning and creativity.
- Display knowledge of the basic life processes on several levels of organisation: molecular, cellular, tissues, organs, individual and populations.
- Display theoretical and practical knowledge of the major molecular and cellular bases of human and animal pathologies.
- Identify and understand the advances and challenges of research.
- 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. Describe the organisation of the cerebral crust and the sensory and motor cortex.
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. Develop scientific knowledge, critical reasoning and creativity.
6. Identify and understand the advances and challenges of research.
7. Respect diversity in ideas, people and situations.
8. Understand the behavioural and cognitive development of the human brain.
9. Understand the principal neuronal disorders.
10. Work as part of a group with members of other professions, understanding their viewpoint and establishing a constructive collaboration.

## Content

### Unit 1. SLEEP AND WAKING

1. Circadian rhythms
2. Behavioural and physiological characteristics of sleep and waking
3. Neural mechanisms
4. Functions of sleep

### Unit 2. REWARD

1. Motivational systems
2. Neural mechanisms of reward systems
3. Addiction

### Unit 3. INGESTIVE BEHAVIOR

1. Digestion and metabolism
2. Peripheral regulation of mechanisms of eating
3. Neural control of eating

#### 4. Thirst

### Unit 4. SEXUAL AND PARENTAL BEHAVIOURS

1. Sexual hormones: organizational and activational effects
2. Neural control of sexual behavior
3. Pheromones
4. Parental behaviour

### Unit 5. EMOTION

1. Nature of emotions and feelings
2. Functions of emotions
3. Neural control of emotions

### Unit 6. LEARNING AND MEMORY

1. Nature of learning and memory
2. Synaptic plasticity
3. Implicit learning and memory
4. Explicit learning and memory
5. Working memory

## **Methodology**

### DIRECTED ACTIVITY (30%)

#### a) Master Classes (WHOLE GROUP, 11 weeks).

- Master classes with ICT support and questions for debate.
- Practical exercises and problem solving.
- Viewing and discussing short videos.

#### b) Seminars (GROUP 1/2, 4 weeks).

- Development of cooperative team work.
- Reading of papers and other texts.
- Practical exercises and self-evaluation.
- Problem solving and debates.

#### c) Workshops (GROUP 1/4, 2 weeks).

- Models of the digestive system, the nervous system: anatomy and physiology activities, and problem solving exercises.

- Small-group exercises on learning and memory.

#### SUPERVISED ACTIVITY (5%)

Tutorials. Online and one-to-one.

- Correction and supervision of the key questions of the syllabus.
- Reflections on readings.
- Clarifying doubts.
- Individualized study strategies.

#### AUTONOMOUS ACTIVITY (60%)

- Documentation.
- Comprehensive reading of materials (books, scientific papers, outreach articles, webs).
- Study of 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 Moodle platform, coordinated by the teacher.

#### ASSESSMENT ACTIVITY (5%)

- Individual oral and/or written tests (multiple-choice, open questions and/or practical exercises).
- Oral presentation and written abstract.
- Tasks and activities (carried out in class or at home).

### Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Master classes with ICT support	33	1.32	8, 9, 1, 2, 10
Seminars and Workshops	12	0.48	8, 9, 1, 5, 2, 7, 10
Type: Supervised			
Tutorials. Online and one-to-one	7.5	0.3	9, 5, 3, 7, 10
Type: Autonomous			
Comprehensive reading of materials (books, scientific papers, outreach articles, webs)	20	0.8	8, 9, 1, 5, 4, 3, 2, 6
Documentation	12	0.48	4, 3, 6
Exercises and activities	13	0.52	8, 9, 1, 4, 3, 7

Study of basic concepts of the subject	36.5	1.46	8, 9, 1, 5, 4, 3, 2
Team project to create an oral presentation and discussion	12	0.48	8, 9, 1, 4, 3, 2, 6, 7, 10

## Assessment

The evaluation of the subject is based on a continuous assessment through different tests and activities in which the students have to demonstrate that they have achieved the corresponding competences and learning results. It consists of 4 learning evidences:

1. EV1. Learning Evidence 1 (compulsory). Written or oral individual test (multiple-option, development and/or short questions). Topics of master, seminar and workshop classes on Units 1, 2 and 3 (35% of final grade).
2. EV2. Learning Evidence 2 (compulsory). Written or oral individual test (multiple-option, development and/or short questions). Topics of master, seminar and workshop classes on Units 1, 2, 3, 4, 5 and 6 (40% of final grade).
3. EV3. Learning Evidence 3 (optional, seminars). Teamwork: Short oral presentation, discussion, and written abstract (20% of final grade). In each seminar 3 projects are presented.
4. EV4. Learning Evidence 4 (optional): Exercises and tasks, carried out in class or at home (5% of final grade).

The evaluation 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 obtained from the weighted average of all the assessment activities carried out.
- d) The subject will be passed with a weighted average (of all the evidences provided) equal to or greater than 5 points out of 10, with a minimum of 3.5 points (on a scale of 0 to 10) in each of the 2 compulsory evidences (EV1 and EV2). If these requirements in section d are not met, the maximum grade that can be obtained is 4.9 points.
- e) Only those students who have completed the compulsory evidences (EV1 and EV2) but have obtained a continuous assessment grade (EV1 + EV2 + EV3 + EV4) of less than 5 points and equal to or greater than 3.5 points out of 10 can opt for the reassessment test. The test will consist of the repetition of one of the compulsory learning evidences (usually the lower graded one) according to the teacher's criteria. The criterion to pass the reassessment will be the same as for section d, and the grade of the reassessed evidence will be replaced. Thus, a minimum score of 3.5 in the evidence to be reassessed (EV1 or EV2) must be obtained in order to be able to pass the subject (overall grade greater than 5). The highest possible grade will be 7 out of 10. If the established requirements are not fulfilled, the highest grade that may be included in the academic record is 4.9 points.
- f) Students of second or subsequent enrolments may choose, before the date specified at the beginning of the course, to follow the continuous assessment or take an integrative test, which will consist of a written test with questions on the whole subject, with no option to be reassessed.

Link to the Evaluation Guidelines of the Faculty of Psychology:

<https://www.uab.cat/web/estudiar/graus/graus/avaluacions-1345722525858.html#e1>

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
EV1. Written or oral individual test (multiple-option, open question and/or short questions)	35%	2	0.08	8, 9, 1, 5, 4, 3, 2, 6, 7
EV2. Written or oral individual test (multiple-option, open question and/or short questions)	40%	2	0.08	8, 9, 1, 5, 4, 3, 2, 6, 7

EV3 (optional). Teamwork: Short oral presentation, discussion, and written abstract	20%	0	0	8, 9, 1, 5, 4, 3, 2, 6, 7, 10
EV4. Exercises and tasks, carried out in class or at home	5%	0	0	5, 4, 6

## Bibliography

- Bear, Mark F.; Connors Barry W.; Paradiso, Michael A. (2016) Neuroscience: Exploring the brain (4th ed) Wolters Kluwer.
- Carlson Neil R. (2014) Fisiología de la conducta (11 edició) Madrid: Pearson Educación.
- Carlson Neil R.; Birkett, Melissa A. (2019). Fisiología de la conducta (12 edició). Madrid: Pearson.
- Collado Guirao, Paloma; Guillamón Fernández, Antonio; Pinos Sánchez, Helena; Rodríguez-Zafra, Mónica; Claro Izaguirre, Francisco; Carrillo, Beatriz (2017) Psicología Fisiológica. Madrid: UNED
- Morgado Bernal, Ignacio (2007) Emociones e inteligencia social: las claves para una alianza entre los sentimientos y la razón. Barcelona: Ariel..
- Morgado Bernal, Ignacio (2014) Aprender, recordar y olvidar: claves cerebrales de la memoria y la educación. Barcelona: Ariel.
- Morgado Bernal, Ignacio (2017) Emociones corrosivas. Barcelona:Ariel.
- Morgado Bernal, Ignacio (2019) Deseo y placer. Barcelona: Ariel.
- Purves, Dale; Augustine, George J.; Fitzpatrick, David; Hall, William C.; Lamantia, Anthony-Samuel; White, Leonard E. (2012) Neuroscience (5th ed). Oxford University Press.
- Rosenzweig, Mark R., Breedlove, S.Marc; Watson, Neil V. (2005) Psicobiología. Una introducción a la neurociencia conductual, cognitiva y clínica (2ª edició actualitzada). Barcelona: Ariel.