

Fundamentals of Psychobiology I

Code: 102607
ECTS Credits: 6

Degree	Type	Year	Semester
2502443 Psychology	FB	1	1

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

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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

Other comments on languages

The literature and materials are in Catalan, Spanish or English. Classes are in Catalan or English.

Teachers

Margalida Coll Andreu
David Costa Miserachs
Marcos Pallarés Anyo
Isabel Portell Cortés
Jordi Silvestre Soto
Soleil García Brito
Silvia Fuentes García
Raul Andero Gali

Prerequisites

No prerequisites are required.

Objectives and Contextualisation

This subject is considered basic and compulsory within the Degree in Psychology at the UAB.

The course aims to provide the necessary knowledge of physiology of the neuron and neurochemistry to study the relationships between the behavioural processes and their biological substrate in the subsequent subjects of the area of Psychobiology. The purpose is that the students should be able to understand and correctly use the terminology of the subject, and demonstrate knowledge of:

1. The main characteristics of neurons and glial cells.

2. The characteristics of the nervous impulse and its conduction.
3. The characteristics of the synaptic transmission and of the neurotransmitters.

Competences

- Develop strategies for autonomous learning.
- Identify, describe and relate the biology of human behaviour and psychological functions.
- 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.
- Use different ICTs for different purposes.
- Work in a team.

Learning Outcomes

1. Develop strategies for autonomous learning.
2. Discover the main components of nerve tissue and explain the basic structural, ultrastructural and molecular characteristics of nerve cells and different types of synapses.
3. Explain the characteristics of the nerve impulse and its conduction.
4. Explain the main characteristics of synaptic transmission and the best-known systems of substance transmission.
5. Explain what psychobiology is and how it is related to the rest of psychology.
6. 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.
7. Use different ICTs for different purposes.
8. Work in a team.

Content

UNIT 1. The Cells of the Nervous System.

- 1.1. The neuron.
- 1.2. The glial cells of the CNS.

UNIT 2. Excitability and Neuronal Conductivity.

- 2.1. Transport through the membrane.
- 2.2. Resting potential.
- 2.3. Action potential.
- 2.4. Conduction of action potentials.

UNIT 3. Synaptic Transmission.

- 3.1. Definition and general characteristics.
- 3.2. Basic mechanisms of chemical synaptic transmission.
- 3.3. Synaptic modulation.
- 3.4. Mechanisms of synaptic plasticity.

UNIT 4. Transmitting substances.

- 4.1. Differences between neurotransmitters and hormones.
- 4.2. General concepts of pharmacology.
- 4.3. Excitatory amino acids neurotransmitters: glutamate and aspartate.
- 4.4. Inhibitory amino acids neurotransmitters: GABA and glycine.
- 4.5. Acetylcholine.
- 4.6. Catecholamines: noradrenaline, dopamine and adrenaline.
- 4.7. Serotonin.
- 4.8. Neuropeptides: opioids and non-opioids.
- 4.9. Other types of neurotransmitters: nitric oxide, purines and endocannabinoids.

Methodology

The teaching methodology is based on different training activities. Depending in the case, master classes, seminars, workshops, supervised and autonomous activities will be performed.

Type: directed

- Master classes (whole group): 31,5h.
- Seminars: 16h.
- Workshops: 4h.

Type: supervised

- Tutorials (on line and classroom attendanceed): 11h.

Type: autonomous

- Documentation: 11h.
- Study: 52h.
- Self-evaluation exercises: 2h.
- Reading texts, monographs and, articles: 10h.
- Unit 4 preparation: 9h.

N.B. The proposed teaching and assessment methodologies may experience some modifications as a result of the restrictions on face-to-face learning imposed by the health authorities. The teaching staff will use the Moodle classroom or the usual communication channel to specify whether the different directed and assessment activities are to be carried out on site or online, as instructed by the Faculty"

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Master classes (whole group)	31.5	1.26	2, 3, 4, 5, 6
Practical sessions (1/2 group)	16	0.64	2, 3, 4, 5, 6, 8
Workshops (1/4 group)	4	0.16	2, 3, 4, 5, 6, 8

Type: Supervised

Tutorials (on line and classroom attendance)	11	0.44	2, 3, 4, 5, 6
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Type: Autonomous

Neurotransmitters unit preparation	9	0.36	1, 4, 6
Reading of texts, monographs and papers	10	0.4	6
Reading of texts, monographs and papers	10.5	0.42	2, 3, 4, 5, 6, 7
Self-evaluation exercises	2	0.08	2, 3, 4, 6
Study	52	2.08	2, 3, 4, 5, 6

Assessment

Evaluation activities

The evaluation is continuous and is based on 4 learning evidences, which are written and individual. The final grade will be obtained based on the weighted average of the learning evidences:

- Learning evidence 1. EV1:

- 20% of the final grade.
- Open questions about the nervous system cells and the physiology of the neuron. Unit 1 and 2.
- Timing: First assessment period.

- Learning evidence 2, EV2:

- 20% of the final grade.
- Test questions of neurotransmitters. Unit 4
- Timing: In January, between week 17 and 19, before the second evaluation period. The specific day and time will be announced through the moodle classroom at least 15 calendar days in advance. The evidence will be made virtually.

- Learning evidence 3

- EV3a:

- 20% of the final grade.
- Test questions of all the units (unit 1, 2, 3 and 4).
- Timing: Second assessment period.

- EV3B:

- 40% of the final grade.
- Open questions to assess the comprehension and integration of all the units (unit 1, 2, 3 and 4).
- Timing: Second assessment period.

Subject passed: The subject is considered passed when the weighted average of the learning evidences is equal or greater to 5.

Reassessment tests

Reassessment test can be done only by those students who:

- have not achieved the established criteria to pass the subject and have a score greater than or equal to 3.5 points. That is, the final grade must be less than 5 and equal or equal to 3.5 points.
- have previously been evaluated in activities whose weight equals to a minimum of 66.6% parts of the total grade of the subject.
- Reassessment test:
 - Individual and written test.
 - Open questions to assess the comprehension and integration of all the units (unit 1, 2, 3 and 4)
 - Timing: resit examination period.
 - Passing this test (minimum of 5 points out of 10) will allow the student to pass the subject with a 5.

Definition of "Not evaluable student"

Students who have not performed any of the assessment tests or have completed learning evidences with a weight lower than 40% for the whole subject will be marked as "Not evaluable"

Students registered for the subject for the second (or more) time

These students will have to follow the same evaluation system as those registered for the first time.

Only in exceptional cases, such as students who are studying abroad with the Erasmus programme, will the possibility of a final exam be considered, instead of continuous assessment. These students will take a single final exam, with no possibility to be reassessed. To be eligible for this type of assessment, students should contact the teachers during the first two weeks of the course. After this period, students will no longer be eligible for the final exam, and will be assessed by the standard continuous assessment system. At this link the assessment guidelines of the Faculty of Psychology can be checked:

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

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Learning evidence 1	20%	1	0.04	2, 3, 5
Learning evidence 2	20%	1	0.04	4
Learning evidence 3a	20%	0.5	0.02	2, 1, 3, 4, 5, 8, 7
Learning evidence 3b	40%	1.5	0.06	2, 1, 3, 4, 5, 6, 8, 7

Bibliography

Basic bibliography:

Neil R. Carlson (2018). Fisiología de la conducta, 12^a edición. Madrid: Pearson Educación. (Tema 1, Tema 2, Tema 3 i Tema 4. Capítulo 2. Estructura y funciones de las células del sistema nervioso).

Juan Antonio García-Porrero Pérez, Juan Mario Hurlé González (2015). Neuroanatomía Humana. Madrid: Editorial Médica Panamericana. (Tema 1: Capítulo 1: componentes celulares y organización funcional del tejido nervioso).

Eric J. Nestler, Steven E. Hyman, David M. Holtzman, Robert C. Malenka (2017). Neurofarmacología molecular. Fundamentos de neurociencia clínica, 3e. Madrid: McGraw-Hill/Interamericana de España. (Tema 3 i Tema 4. Parte I: Fundamentos de Neurofarmacología, Parte II: Sustratos Neurales de la acción farmacológica).

Dale Purves, George J. Augustine, David Fitzpatrick, William C. Hall, Anthony-Samuel LaMantia, James O. McNamara, S. Mark Williams, 5^a edición (2015). Neurociencia. Madrid: Medica Panamericana. (Capítulo Tema 1: 1 Estudio del sistema nervioso. Tema 2, Tema 3 i Tema 4: Unidad I. Señalización neural).

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Complementary bibliography:

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