

STUDENT GUIDE

Subject:

Principles of Neuroscience

Coordinator: Dr. Xavier Navarro Acebes

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UAB Code : 44134

Modality: mandatory

6 ECTS

Presential classes:

1st semester of the 2024-2025 academic year

Dates: from October 14th to 18th and from October 21st to 25th, 2024

Schedule: from 9 a.m. to 2:30 p.m.

Objective

To deepen in the knowledge of the nervous system: structural, anatomical and functional bases, methods of exploration and evaluation, physiopathology and lesion mechanisms and the main therapeutic strategies used in the treatment of the pathologies of the central nervous system.

Contents:

- Structure and function of the Nervous System
- Methods of evaluation of the Nervous System
- Physiopathology and mechanisms of the lesions of the Nervous Systems

Workload

6 ECTS: equivalent to 150 hours of student work, of which 52.5 hours are face-to-face, 7.5 hours supervised hours and 90 hours autonomous work.

Learning outcomes**Knowledge:**

- At the end of the subject, students will be able to:
- Identify the different structures of the Nervous System.
- Use the main evaluation methods of the Nervous System.
- Manage the main therapeutic strategies used in the treatment of Central Nervous System pathologies.
- Master the basic pathophysiological mechanisms that influence neurological diseases.

Skills:

At the end of the subject, students will be able to:

- Analyze the relationship between anatomy and physiology with the assessment and treatment of neurological disorders.
- Reason the importance of neurophysiological exploration methods with treatment planning.

Competences:

At the end of the subject, students will be able to:

- Act according to the criteria of each professional discipline to adequately carry out the neurological examination and the appropriate treatment techniques.
- Transmit to patients the relationship between the diagnosis of the affection and the approach to appropriate treatment.

Teaching methodology

The methodological approach of the subject is based on considering the student as the protagonist of his teaching and learning process. The student must be active and autonomous throughout the process and the teaching staff will support them by providing the necessary information and resources to achieve the best learning results.

The subject is face-to-face with compulsory attendance at least 80% of the classes. Also part of the teaching-learning process is preparing assignments, personal study, reading recommended articles/reports of interest that will be discussed in class (problem solving) and sharing experiences from laboratory/clinical practices (discussions). , oral expository presentations

with audiovisual support (inverted class) and workshops held during its development (cooperative learning).

Through the *e-learning Guttmann platform* you will have access, among others, to the calendar and class schedules, to bibliographic support documentation, and you can also use it to do a collaborative work between the students and, between the students and teachers to clarify doubts, to share interesting findings, news, articles, books, conferences, etc.

The students will also have hours of autonomous work to integrate what happens in class in person, also having the possibility of being supervised during workshops, exhibitions or via direct consultation with the teaching staff outside of direct teaching hours.

Regarding the supervised activities, during the tutorials, a more individualized attention will be provided to the students to delve into aspects of personal interest.

The information in this document provides a brief summary of the main features of the program and expected learning outcomes.

Contents description:

- Structure and function of the nervous system
 - General anatomy of the CNS
 - Skeletal muscle
 - Segmental Motor Nervous System
 - Suprasegmental Motor Nervous System
 - Somatosensory Nervous System
 - Special senses: hearing, vestibular, vision
- Methods of evaluation of the nervous system
 - Clinical examination of the Nervous System
 - Electrophysiological evaluation methods
 - Neuroradiological techniques
- Physiopathology and mechanisms of nervous system injuries
 - Injury and regeneration of the PNS
 - CNS injury and regeneration
 - Reparative therapies in SCI
 - Neurogenesis and stem cells
 - CNS plasticity
 - Neuromodulation
 - Substitutive and rehabilitation therapies in PNS
 - Pathophysiology of neuropathic pain
 - Pathophysiology of spasticity

Evaluation

The evaluation activities will be carried out through and at the end of the subject. These are activities that you must work individually and consists of:

1. Theoretical test 1: It has a value of **40% of the final grade for the subject** and will consist of 1 multiple-choice questionnaire or open short questions on the topics of the program, one for each block or week of teaching. Once each block is finished, you will have access to the test through the e-learning.guttmann platform.

2. Theoretical test 2: It has a value of **40% of the final grade for the subject** and will consist of 1 multiple-choice questionnaire or short open questions on the topics of the program, one for each block or week of teaching. Once each block is finished, you will have access to the test through the e-learning.guttmann platform.

3. Case resolution tests. They have a value of **10% of the final grade for the subject**.

They will consist of exercises for the pathophysiological evaluation of clinical cases and research proposals. They will be carried out in the classroom and through the e-learning.guttmann platform.

4. Class attendance and participation has a weight of **10% in the final grade for the course**. The maximum date for the delivery of the test will be determined according to the calendar established at the beginning of the course.

- If you do not present evidence of learning or you have not attended the minimum number of hours of the programmed activities of the subject (80%), the subject will be “not evaluable”. The qualification of not evaluable in the final evaluation report implies exhausting the inherent right in the subject’s enrollment.
- You will pass the subject if you obtain a minimum score of 5 points (scale 0-10) as the average mark of the two evaluative tests of learning.

Procedure and recovery criteria

The re-evaluation is a process that will be put into operation once the period of publication of the final grades has ended.

- You will be entitled to a re-evaluation if you have obtained between 3.5 and 4.9 in the average grade of the two evaluative tests of the subject.
- The test submitted to the re-evaluation process may not exceed 5.0 points (approved) in the final grade.

The subject’s web

In the web of each subject, you will find information of interest for the follow-up of the study:

- Forum of the subject. Through this space you can keep in touch with the teachers or among the other students, to provide suggestions, answer questions, etc.
- News. It is the space from where you Will receive news and announcements about the evolution of the subject.
- Programs. The subject can be downloaded in PDF format, indicating the subjects, schedules and the teaching staff.

- Documentation. Here you Will find information and bibliography of interest that you can consult for the later study of the topics.
- Evaluation of competences. In this space you Will find all the necessary information and the delivery dates of the evaluation that will be done for this subject

Satisfaction surveys

It is very important that students send us your comments, complaints, and suggestions regarding the subject.

There are two anonymous assessment questionnaires:

- Assessment of the teaching staff. Through mobile phone or e-mail, students will receive satisfaction questionnaires for the teaching action of teachers who have participated in the subject. They are short questionnaires, easy to fill out and very important for the coordination of the master's degree, since the opinion of the students will be of great help for the improvement of this subject in future editions.

<https://forms.gle/GLhnS7PdMJjaNi988>

- Evaluation of the subject. At the end of the subject, the general evaluation questionnaire of its contents can be answered.

<https://forms.gle/csQ7vsDqh3LetP8D7>

Coordination

For any aspect of the organization and planning of the subject you can contact

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RECOMMENDED BIBLIOGRAPHY

Programa del 1r bloque:

- Purves D et al. *Neurociencia*. (5ª ed). Panamericana.
- Haines DL et al. *Principios de Neurociencia*. (2ª ed.). Elsevier.
- Netter F. *Atlas de Neurociencia*. Elsevier Masson.
- Clínica Mayo (aut.). *Exploración Clínica en Neurología*. Editorial JIMS, 1999.

Programa del 2o bloque:

- Selzer M, Dobkin B. *Spinal Cord Injury*. AAN Press, 2008
- SERMEF. *Evaluación Clínica y Tratamiento de la Espasticidad*. Panamericana, 2009.
- Serra J. *Tratado de dolor neuropático*. Panamericana, 2007.
- Taub E (ed). *Neuroplasticity and Neurorehabilitation*. Frontiers Human Neuroscience, 2015
- Wang KKW. *Neurotrauma: A Comprehensive Textbook on Traumatic Brain Injury and Spinal Cord Injury*. Oxford University Press, 2018.
- Willette K. Don't call it a miracle: The movement to cure spinal cord injury. Christopher & Dana Reeve Foundation, 2015