1. OVERVIEW

Subject Area	THE NERVOUS SYSTEM
Degree	Bachelor's Degree in Medicine
School/Faculty	Biomedical and Health Sciences
Ac. Year	5
ECTS	7 ECTS
Type	Compulsory
Language(s)	Spanish
Delivery Mode	On campus
Semester	Six-monthly

2. INTRODUCTION

This is a compulsory subject belonging to the Human Clinical Training module and is taught during the semester. It consists of 3.5 theory-based credits and 3.5 ECTS in clinical placements. To take this course, students must have passed at least 150 ECTS in the first three years.

The overall objectives of the subject area are:

• Provide knowledge of aetiology, symptomatology, diagnostics, prognosis and prevention of neurological and psychiatric disorders.
• Organise the gathering of patient information to draw up a clinical history (anamnesis and physical examination).
• Describe the use and indication of the main complementary tests in neurology and psychiatry.
• Learn the steps involved in making a diagnosis, prognosis and treatment plan for the main neurological and psychiatric pathologies.
• Decide on and propose the suitable preventative measures in different clinical situations associated with the main neurological and psychiatric pathologies.

3. SKILLS AND LEARNING OUTCOMES

General skills (CG, by the acronym in Spanish):

- CG1: Recognise the essential parts of being a medical professional, including ethical principles and legal responsibilities.
- CG2: Understand the importance of such principles to benefit patients, society and the profession, with particular attention paid to professional secrecy, confidentiality and intimacy.
- CG3: Know how to apply the principle of social justice to professional practice.
- CG4: Develop professional practice taking into account patient autonomy, beliefs and culture.
- CG5: Be aware of the need to maintain and update professional skills, paying special attention to continuous self-learning of emerging knowledge and to discover new products and techniques with the aim of improving quality.

- CG6: Carry out professional activity with regard to other health professionals.
- CG9: Understand and recognise the effects, mechanisms and manifestations of a disease on the structure and functioning of the human body.
- CG10: Understand and recognise the causal agents and risk factors which determine health conditions and the development of a disease.
- CG12: Understand the principles of action, indications and effectiveness of therapeutic interventions, based on the available scientific evidence.
- CG13: Obtain and elaborate a clinical history report with all relevant information.
- CG14: Perform a physical examination and mental health assessment.
- CG15: Have the ability to carry out an initial diagnosis and establish a well-founded approach to making a diagnosis.
- CG17: Establish the diagnosis, prognosis and treatment, applying the principles based on the most reliable information possible.
- CG18: Indicate the most suitable therapy for the most common acute and chronic processes, including patients in the terminal phase.
- CG19: Raise and propose the suitable preventative measures required for each clinical situation.
- CG20: Acquire sufficient clinical experience under supervision in hospital institutions, health centres or other healthcare institutions.
- CG21: Listen attentively, obtain and synthesise information regarding the problems troubling the patient and understand this information.
- CG22: Write clinical histories and other medical records in a way so they can be understood by other people.
- CG23: Communicate effectively and clearly, both orally and in writing, with patients, family members, media and other professionals.
- CG24: Establish good interpersonal communication which allows you to efficiently and empathetically connect with patients, family members, media and other professionals.
- CG26: Assume a role in the prevention and protection against diseases, injuries or accidents, together with the maintenance and promotion of health, both on an individual and community level.
- CG31: Know how to use information and communication technology in clinical, therapeutic, preventative and research activity.

Basic Skills (CB, as per the Spanish acronym):

- CB2: Students can apply their knowledge to their work professionally and possess the necessary skills, usually demonstrated by forming and defending opinions, as well as resolving problems within their study area.
- CB3 Students have the ability to gather and interpret relevant data (usually within their study area) to form opinions which include reflecting on relevant social, scientific and ethical matters.
- CB4: Students can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences.
- CB5 Students have developed the learning skills necessary to undertake further study in a much more independent manner.

Cross-curricular skills (CT, by the acronym in Spanish):

- CT1. Communication: ability to engage in active listening, ask questions and respond in a clear and concise way, as well as to effectively express ideas and concepts. This includes concise and clear written communication.
- CT3. Teamwork: ability to integrate and collaborate actively with other people, areas and/or organisations to reach common goals, evaluate and integrate contributions from the rest of the group members and create a good working environment.

- CT4. Adaptability: ability to detect, interpret and respond to a changing environment. Ability to equip themselves and work effectively in different situations and/or with different groups or individuals. This means adapting to change depending on circumstances or needs. It involves the confidence to take on crucial challenges on a personal or group level, maintaining a good physical and mental health to allow work to be carried out effectively.
- CT6. Problem solving: ability to solve an unclear or complex issue or situation which has no established solution and requires skill to reach a conclusion.
- CT10. Independent learning: the ability to govern your own development by choosing the most effective lines of action, strategies, tools and opportunities to independently learn and apply knowledge to practice.

Specific skills (CE, by the acronym in Spanish):

- CE 3.1.13 Recognise, diagnose and direct treatment of the main central and peripheral nervous system pathologies.
- CE 3.2.1 Know how to do a full anamnesis focussed on the patient and with a view to diverse pathologies, interpreting its meaning.
- CE 3.2.2 Know how to perform a physical examination of the systems and apparatus, as well as a psychopathological assessment, being able to interpret the results.
- CE 5.1.1 Complete a student work placement, involving independent clinical rotation and a final skills assessment in health centres, hospitals and other care facilities, which allows students to incorporate professional values, healthcare communication skills, clinical reasoning, clinical management and critical judgement. This also requires students to familiarise themselves with the most common health problems in Medicine, Surgery, Obstetrics and Gynaecology, Paediatrics, Psychiatry and other clinical areas.

Learning outcomes (RA, by the acronym in Spanish):

- Recognise the most common pathologies of the central and peripheral nervous system: intracranial hypertension, migraines, vertigo, cerebellar disorders, meningitis, convulsions, encephalopathy, cranioencephalic trauma, peripheral neuropathy, autonomic neuropathy, myopathies and other important pathologies of the central and peripheral nervous system.
- Diagnose the most common pathologies of the central and peripheral nervous system: clinical history and physical examination focusing on the central and peripheral nervous system pathology, suitability and interpretation of the main complementary neurological tests, laboratory tests, image tests, anatomical pathology tests, etc.
- Direct the medico-surgical treatment of the most common pathologies of the central and peripheral nervous system.

The following table shows how the skills developed in the subject area match up with the intended learning outcomes:

Skills	Learning outcomes
CB2, CG9, CG10, CG20, CT10, CT6, CE 3.1.13, CE 5.1.1	Recognise the most common pathologies of the central and peripheral nervous system: intracranial hypertension, migraines, vertigo, cerebellar disorders, meningitis, convulsions, encephalopathy, cranioencephalic trauma, peripheral neuropathy, autonomic neuropathy, myopathies and other important pathologies of the central and peripheral nervous system.

CB3, CB5, CG1, CG2, CG5, CG13, CG14, CG15, CG17, CG20, CG22, CG23, CT3, CT6, CT10, CE 3.1.13, CE 3.2.1, CE 3.2.2, CE 5.1.1	Diagnose the most common pathologies of the central and peripheral nervous system: clinical history and physical examination focusing on the central and peripheral nervous system pathology, suitability and interpretation of the main complementary neurological tests, laboratory tests, image tests, anatomical pathology tests, etc.
CB4, CB5, CG3, CG4, CG5, CG6, CG10, CG12, CG18, CG19, CG20, CG23, CG24, CG26, CT3, CT1, CT4, CT10, CE 3.1.13.	Direct the medico-surgical treatment of the most common pathologies of the central and peripheral nervous system.

4. CONTENTS

MODULE: NEUROLOGY
TOPIC 1: Neurological disease patient focus. Migraines.
TOPIC 2: Epilepsy.
TOPIC 3: Cerebrovascular pathology.
TOPIC 4: Disorders of consciousness.
TOPIC 5: Dementia.
TOPIC 6: Movement disorders or extrapyramidal system diseases.
TOPIC 7: Hereditary or acquired ataxia.
TOPIC 8: Autoimmune inflammatory diseases of the CNS.
TOPIC 9: Motor neuron diseases. Amyotrophic lateral sclerosis.
TOPIC 10: Pathology of the peripheral nervous system (PNS).
TOPIC 11: Neuromuscular junction diseases: Myasthenia gravis and other myasthenic syndromes.
TOPIC 12: Muscular diseases: Myopathies.
TOPIC 13: Electrophysiological diagnosis of neuromuscular pathology.
TOPIC 14: Polysomnography. Neurological sleep disorders.
TOPIC 15: Diagnostic imaging of nervous system pathology.
TOPIC 16: Neurological pathology associated with systemic and toxico-metabolic disease.
MODULE: NEUROSURGERY
TOPIC 1: Main cranioencephalic malformations and spinal-cord injury (spina bifida).
TOPIC 2: Hydrocephaly and other alterations of the cerebrospinal fluid circulation.
TOPIC 3: Subarachnoid haemorrhage. Aneurysms and arteriovenous malformations. Intraparenchymal haemorrhages.
TOPIC 4: Brain tumours.
TOPIC 5: Spinal cord tumours.
TOPIC 6: Cranioencephalic trauma: general aspects. Fractures. Post-traumatic cerebral oedema.
TOPIC 7: Spinal cord traumas.
TOPIC 8: Degenerative pathology of the cervical and lumbar spine.

TOPIC 9: Functional neurosurgery. Surgical treatment of pain, epilepsy and Parkinson's disease.
NEUROLOGY SEMINARS
SEMINAR 1: STUDY OF THE CEREBROSPINAL FLUID
SEMINAR 2: NEUROLOGICAL EXAMINATION
SEMINAR 3: EEG AND EMG
SEMINAR 4: EVALUATION OF COGNITIVE FUNCTIONS
SEMINAR 5: CLINICAL EVALUATION OF A STROKE PATIENT

5. TEACHING/LEARNING METHODS

The types of teaching/learning methods are as follows:

- Problem-based learning: Presentation of problems, reorganising into small groups, literature analysis, analysis of scientific texts and documents, symposiums and presentations, directed debates, specialised individual and collective tutorials, and reaching a consensus.
- Lectures: Classroom presentations by the professor on basic theory, encouraging debate and student participation.
- Case study method: presentation and discussion of clinical cases in small groups.
- Skills learning in the classroom and simulation environments: Practical work with IT programs, anatomical models, human dissection and standardised patients.
- Experiential learning in supervised clinical placements in the different hospital services: problem-solving in a practical context observing the tutor, being observed by the tutor, or with the tutor's supervision. Students will integrate themselves and participate in the activities performed in the healthcare units. The student activities will be programmed, tutor-assisted and assessed by the tutor.

6. LEARNING ACTIVITIES

The types of learning activities, plus the amount of time spent on each activity, are as follows:

On campus:

Learning activity	Number of hours
Theory/practical learning activities on-campus	38
Directed learning activities	11
Independent working	30
Clinical placements	88
Tutorials	6
Knowledge tests	2
TOTAL	175h

7. ASSESSMENT

The assessment methods, plus their weighting in the final grade for the subject area, are as follows:

On campus:

	Assessment system	Weighting
THEORY (50%)	Continuous assessment	10%
	Final assessment exam	40%
PRACTICAL PART (50%)	Attitude (rubric)	5%
	Clinical practice (rubric)	20%
	ECOE	25%

8. BIBLIOGRAPHY

The reference work for the follow-up of the subject is:

NEUROLOGY

- Principios de Neurología. Adams y Victor. 10ª edición. Ropper Allan, Samuels Martín.
- Harrison. Principios de Medicina Interna, 20ª edición. Dennis Kasper, Anthony Fauci, Stephen Hauser, Dan Longo, J. Larry Jameson, Joseph Loscalzo.
- NEUROLOGIA CLÍNICA BÁSICA, 2ª ed. Felix Bermejo Pareja, Ed: Autor.Editor. ISBN 978- 84-615-9168-8.

NEUROSURGERY

- Principles of Neurological Surgery, Ellenbogen, fourth edition.

Recommended bibliography is indicated below:

- PROMIR::

Amato AA, Russell JA. eds. Neuromuscular disorders. 2nd ed. McGraw Hill; 2016

Brazis PW, Masdeu JC, BillerJ. Localization in clinical neurology. Philadelphia: Wolters Kluwer; 2017

Caplan LR, J Van Gijn. Stroke syndromes. Cambridge; New York: Cambridge University Press, Cop; 2012.

Jankovic J, Hallett M, Okun MS, et al. Principles and Practice of Movement Disorders 3rd Ed: Elsevier; 2022

Jankovic J, Mazziotta JC, Scott Loren Pomeroy, Newman NJ, Bradley WG. Bradley and Daroff's Neurology in Clinical practice. 8th ed. Amsterdam: Elsevier; 2021.

López González FJ, e d. Manual de Práctica Clínica en Epilepsia. Recomendaciones diagnóstico-terapéuticas de la SEN. Madrid: Sociedad Española de Neurología; 2019

Ropper AH, Adams RD, Victor M, Samuels MA. Adams and Victor's principles of neurology. New York: Mcgraw-Hill Medical; 2009.

Santos Lasaosa S, Pozo Rosich P.eds. Manual de Práctica Clínica en Cefaleas. Recomendaciones diagnóstico-terapéuticas de la Sociedad Española de Neurología. Madrid: Sociedad Española de Neurología; 2020

Zarranz JJ, Neurologia, 6ª Ed. Elsevier; 2018

Álvarez Velasco R, García Madrona S, Nedkova Hristova V. PROMIR: Neurología 2022-2023, 2ª ed. Madrid: Editorial Médica Panamericana; 2022