VNIVERSITAT DE VALÈNCIA

Course Guide
44635 Specialised aspects of functional neurology, neuroanatomy and pathology. Dx and functional assessment

COURSE DATA

DATA SUBJECT

Code: 44635
Name: Specialised aspects of functional neurology,neuroanatomy and pathology. Dx and functional assessment
Cycle: Master's Degree
ECTS Credits: 8
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
2220 - Master's Degree in Functional Recovery in Physiotherapy	Facultat de Fisioteràpia	1	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2220 - Master's Degree in Functional Recovery in Physiotherapy	Specialised aspects of functional neurology, neuroanatomy and pathology. Diagnostic and functional a	ELECTIVES

COORDINATION

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CEZON SERRANO NATALIA

SUMMARY

The subject includes the aplication of diferent aspects of the functional neurology and neuroanatomy to the clinical context. It pretends to explore the principal neurological pathologies to training the physiotherapists in the physical exercise approaches.

Furthermore, advanced techniques in the diagnostic and objective functional assessment are provided.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

COMPETENCES / LEARNING OUTCOMES

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Be able to correctly apply the various evidence-based methodologies available in the treatment of the pathologies and injuries in question

Be able to integrate knowledge and address the complexity of making judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments, while planning a comprehensive approach to patient care.

Deepening Knowledge of Clinical Assessment Methods and Systems in Functional Recovery

Develop the ability to perform appropriate clinical reasoning based on reviewed, analyzed, and critically reflected clinical-scientific evidence, with the appropriate level of specialization

Develop the ability to prepare and deliver both oral and written reports on the functional status of patients

Differentiate specifically the affected structure in a diagnostic image and its implications for functional recovery.

Identify and Analyze Risk Factors, Etiology, and Characteristics of Common Pathologies and Injuries in Clinical Settings

Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.

Students should demonstrate self-directed learning skills for continued academic growth.

Students should possess and understand foundational knowledge that enables original thinking and research in the field.

To delve deeper into the pathophysiology of the most common injuries and diseases.

DESCRIPTION OF CONTENTS

1. Basic aspects of functional neurology, neuroanatomy and pathology

1.1. Movement disorders
Parkinson's disease Epidemiology. Etiology. Pathological anatomy and pathophysiology. Clinical

features. Course and forecast. Differential diagnosis.
Huntington's Korea. Neuropathology Prevalence and hereditary factors. Clinic: chorea, Dementia and other neurological manifestations. Differential diagnosis.
Friederich's ataxia. Epidemiology. Etiology. Pathological anatomy and pathophysiology. Clinical picture Course and forecast Diagnosis.
Spinal cord injury, Ictus, Guillain Barre Syndrome. Etiology. Physiopathology. clinical picture. Impact of injury in their lifestyle and implementation of activities of daily living and exercise.

1.2. Demyelinating diseases
Multiple sclerosis: definition. Symptoms: motor, sensory and sphincter disorders. Paroxysmal phenomena. Signs: motor disorders. Cerebellar and brainstem disorders. Clinical forms of presentation. Evolutionary patterns: recurrent-remitting, acute, chronic-progressive. Epidemiology. Pathogeny.
Subacute disseminated encephalomyelopathy. Definition. Clinic. Evolution and prognosis Laboratory studies. Pathogeny.

2. Diagnostic and functional assessment in the Neurology context

2.1. Structural, functional imaging and video and electroencephalography. Description of the main findings in different neurological pathologies and their implications for the therapeutic approach as well as its evolutionary control.
Muscle electrical activity assessment: surface electromyography. Analysis of movement patterns and neuromuscular characteristics.
Analysis of muscle quality in neurological patients by ultrasound.
Analysis of musculoskeletal disorders in the neurological patient by thermography.

2.2. Biomechanics: kinetic techniques (dynamometric platforms, load cells and portable dynamometers) and kinematic (photogrammetry and inertial sensors). Description of functional alterations (upper and lower limbs, gait and functional gestures) caused by neurological disease and their implications for the therapeutic approach as well as its progression control.
Analysis of the alterations of the muscle chains due to the use of support products.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	24,00
Laboratory	24,00
Total hours	**48,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	15,00
Individual or group project	0,00
Independent study and work	60,00

Preparation of lessons	77,00
Preparation for assessment activities	0,00
Resolution of case studies	0,00
Total hours	**152,00**

TEACHING METHODOLOGY

Theoretical-practical face-to-face classes in which the contents of the subject will be worked on, discussed and carried out using different teaching resources.

Individual and group tutorials will serve as a means of coordinating students in individual and group tasks, as well as for resolving doubts and expanding on content of interest.

Study, realization of tasks and individual works and others of cooperative nature, oriented to the preparation of the theoretical-practical classes, the individual and group work and the oral and written tests that can be done for the evaluation of the acquisition of individual learning.

EVALUATION

Assessment system	Percentage of qualification
Assistance and participation at class. This evaluation system takes into account the implication of the student in the classroom. It will be taken into account that the student responds to the questions formulated by the teacher, raises interesting debates about the information imparted in class, formulates doubts after having reviewed the previously received concepts and/or proposes activities that may be of interest for the dynamics of classroom.	**20%**
Theoretical-practical final test. This test will integrate the knowledge acquired during each of the subjects. Contents that may be conceptual or procedural. The exam may be written or oral depending on the nature of the subject taught.	**80%**

The final mark of the subject will be the weighted average of the different parts of the evaluation, as long as the student has obtained at least a 50% of the maximum mark in each of the tests.

Class attendance is compulsory and is part of the course evaluation. In this sense, a minimum attendance of 80% of the course hours is required to receive the highest grade in this evaluation category. Likewise, except for reasons of force majeure accredited to the master's degree management, a minimum attendance of 50% of the course hours is required to pass this part of the evaluation. Because face-to-face classes are non-recoverable, failing to attend 50% of the hours of the subject means it is impossible to pass the subject in either of the two calls.

REFERENCES

- Abraham MJ. *Physiotherapy for adult neurological conditions*. 1st ed. Cham: Springer-Verlag; 2022.
- Cano de la Cuerda R. *Neurorrehabilitación: métodos específicos de valoración y tratamiento*. Buenos Aires: Editorial Médica Panamericana; 2012.
- Cano de la Cuerda R. *Nuevas tecnologías en neurorrehabilitación: aplicaciones diagnósticas y terapéuticas*. Madrid: Editorial Médica Panamericana; 2018.
- Platz T. *Clinical pathways in stroke rehabilitation: evidence-based clinical practice recommendations*. 1st ed. Cham: Springer Nature; 2021.
- van der Brugge F. *Neurorehabilitation for central nervous system disorders*. 1st ed. Cham: Springer International Publishing; 2018.

Likewise, the books, scientific articles and readings of interest recommended for the preparation of the contents addressed in each topic will be specified at the end of each class.