SUBJECT TEACHING GUIDE

G122 - Human Neuroanatomy

Degree in Medicine

Academic year 2025-2026

1. IDENTIFYING DATA					
Degree	Degree in Medicine			Type and Year	Compulsory. Year 2
Faculty	Faculty of Medicine				
Discipline	Basic Subject Area: Human Anatomy Morphology, Structure and Function of the Human Body				
Course unit title and code	G122 - Human Neuroanatomy				
Number of ECTS credits allocated	6	Term		Semester based (1)	
Knowledge Field	Medicine and odontology				
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. ANATOMIA Y BIOLOGIA CELULAR
Name of lecturer	JUAN MARTINO GONZALEZ
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4. OBJECTIVES

Learning Objectives:

Understand the shape, structure, and development of the central nervous system.

Know the origin, course, and anatomical relationships of the cranial nerves.

Identify the structures innervated by the cranial nerves and their specific functions.

Analyze the function of the different structures that make up the central nervous system and their relationship to anatomical structure.

Skills and Competencies to Be Developed:

a) Apply the scientific method as a way of thinking, promoting rigorous observation of anatomical structures.
b) Acquire and correctly use the anatomical language associated with the studied structures.
c) Develop the ability to clearly, orderly, and accurately describe anatomical structures.
d) Interpret anatomical images in radiological, tomographic, and magnetic resonance imaging studies.

6. SUBJECT PROGRAM	
CONTENTS	
1	SECTION I – GROSS ANATOMY OF THE CENTRAL NERVOUS SYSTEM Topic 1 – Introduction to the Central Nervous System. Components and general structure. Gross anatomy of the spinal cord. Topic 2 – Gross anatomy of the brainstem and the fourth ventricle. Topic 3 – Gross anatomy of the cerebellum. Topic 4 – Gross anatomy of the telencephalon: external configuration. Cerebral hemispheres. Topic 5 – Gross anatomy of the telencephalon: external configuration. Limbic lobe. Topic 6 – Gross anatomy of the telencephalon: internal configuration. Hemispheric white matter. Topic 7 – Gross anatomy of the telencephalon: internal configuration. Basal nuclei. Study of the lateral ventricles. Topic 8 – Gross anatomy of the diencephalon: thalamus, hypothalamus, subthalamus, and epithalamus. Study of the third ventricle. Topic 9 – Anatomy of the meninges. Anatomofunctional study of the cerebrospinal fluid. Topic 10 – Arterial vascularization of the central nervous system. Topic 11 – Venous vascularization of the central nervous system.
2	SECTION II – CRANIAL NERVES Topic 12 – General organization of the cranial nerves. Ocular motor nerves. Muscles of the orbit. Topic 13 – Trigeminal nerve: general considerations. Ophthalmic branch. Topographic overview of the orbital cavity. Topic 14 – Trigeminal nerve: maxillary branch. Topic 15 – Trigeminal nerve: mandibular branch. Topic 16 – Facial nerve. Muscles of facial expression. Topic 17 – Glossopharyngeal nerve. Accessory nerve. Hypoglossal nerve. Topic 18 – Vagus nerve. Overview of the sympathetic and parasympathetic innervation of the craniofacial complex. Topic 19 – Carotid arterial system. Carotid bifurcation. Internal carotid artery. External carotid artery. Jugular venous system. Overview of the lymphatic drainage of the head and neck.

3	SECTION III – FUNCTIONAL ORGANIZATION OF THE CENTRAL NERVOUS SYSTEM A) INFORMATION SYSTEMS Topic 20 – General principles of sensory or perceptual information systems. Somatosensory information system. Modalities of somatosensory sensitivity and receptors. Pathways of general somatosensory sensation (posterior column–medial lemniscus system, anterolateral–spinothalamic system, trigeminothalamic system). Topic 21 – Visceral or interoceptive sensory pathways (nucleus of the solitary tract system, visceral system of the posterior horn or visceral pain pathway). Study of the somatosensory cortex. Specific anatomical and functional aspects of pain. Topic 22 – Auditory information system: general overview and functional anatomy of the external and middle ear. Topic 23 – Auditory information system: functional anatomy of the inner ear. Topic 24 – Auditory information system: auditory pathway, auditory cortex, and main reflexes. Vestibular information system. Topic 25 – Visual information system: functional anatomy of the eyeball and its appendages (eyelids and lacrimal pathways). Topic 26 – Visual information system: retina, optic pathway, visual cortex. Visual reflexes. Topic 27 – Gustatory and olfactory information systems. B) MOTOR SYSTEMS Topic 28 – Anatomical and functional foundations of movement and motor levels. Lower level of motor control: final common pathway and motor unit. Reflex arcs. Topic 29 – Brainstem motor control and indirect motor pathways. Vestibular nuclei system, reticular formation system, red nucleus system, and superior colliculus system. Topic 30 – Voluntary movement system: motor cortex and pyramidal tract. Topic 31 – Movement regulation systems: the cerebellum (structure, cerebellar circuits). Topic 32 – Movement regulation systems: basal ganglia (structure, connections, and functional significance). C) HIGHER BRAIN FUNCTIONS Topic 33 – Introduction to the morphofunctional organization of the nervous system. Cerebral cortex: structure, cortical maps, columnar organization, and functional types of cortical areas (sensory, motor, and associative). Topic 34 – Anatomical foundations of language I. Topic 35 – Anatomical foundations of language II. Topic 36 – Anatomical foundations of memory.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
The exam will consist of 50 multiple-choice questions. To pass the written exam, a minimum of 66% of the maximum score is required (33 correct answers, equivalent to 3 out of 6 possible points). Passing the written exam is mandatory in order to take the o	Written exam	No	Yes	60,00
La evaluación práctica de la asignatura se basa en un proceso de evaluación continua que se valida en un examen final práctico y que podrá suponer hasta el 40% de la calificación final de la asignatura. En el examen práctico se realizarán un total de 20 p	Oral Exam	Yes	Yes	40,00
TOTAL				100,00

Observations
In his/her case, the assessment activities will be conducted online.
Observations for part-time students
The same applies.

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC

Neuroanatomía Humana. (García-Porrero/Hurlé). Ed. Panamericana .2014
Anatomía Humana. (García-Porrero/Hurlé). Ed. McGraw-Hill. 2005.
Neuroanatomía Humana. Aspectos funcionales y clínicos. (Ojeda/Icardo). Ed. Masson. 2004.
Neuroanatomía. Texto y atlas en color. (Crossman/Neary). Elsevier-Masson. Última ed..