



HUMAN NEUROANATOMY

Enrollment year	2020/2021
Academic year	2020/2021
Regulations	DM270
Academic discipline	BIO/16 (HUMAN ANATOMY)
Department	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
Course	NEUROBIOLOGY
Curriculum	PERCORSO COMUNE
Year of study	1°
Period	1st semester (05/10/2020 - 14/01/2021)
ECTS	6
Lesson hours	48 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	ROSSI DANIELA MARIA CARMELITA (titolare) - 6 ECTS
Prerequisites	Basic knowledge of Human Neuroanatomy
Learning outcomes	<p>To acquire basic knowledge on both the microscopic structure of the human nervous tissue and the organization of the human nervous system from the anatomic-topographic point of view. To achieve competence on neuronal pathways suitable for studying the localization of the brain and the peripheral nervous system functions.</p> <p>To develop communication skills on the subject, using appropriate neuroanatomical terminology and organized descriptive ability.</p>
Course contents	<p>Notions of histology of the nervous tissue: subcellular organization of the neuron with particular reference to the structural and ultrastructural characteristics of soma, axon, dendrites and synapses. Heterogeneity of</p>

neurons: morphological, neurochemical and functional classification criteria. Glial cells: morpho-functional characteristics of the different glial cytotypes of the central and peripheral nervous system. The myelin sheath.

Organization of the central and peripheral nervous system.

The spinal cord: external conformation; subdivisions, organization and structure of the grey and white matter; spinal reflexes. Spinal ganglia. Spinal nerves.

The brainstem: external and internal conformation of medulla oblongata, pons and midbrain. The nuclei of the cranial nerves, the brainstem nuclei,

the reticular formation; the IV ventricle. Cranial nerves and basal ganglia.

The cerebellum: structure, cytoarchitecture, functional subdivisions and related archi-, paleo- and neo-cerebellar connections.

The diencephalon: topography and subdivisions; the thalamus and the metathalamus, the epithalamic formations, the periventricular hypothalamus and its neuroendocrine relations, the subthalamus. The III

ventricle

The telencephalon: external and internal conformation. The neopallial telencephalic cortex: cytoarchitecture, regional differences, cortical areas

and functional correlations; the paleopallial cortex and the olfactory pathways; the archipallial cortex. The white substance: the associative, commissural and projection systems; the internal capsule. The grey nuclei of the telencephalic base: the extrapyramidal circuits of motor control. The limbic system. The lateral ventricles.

Main nerve pathways: pyramidal pathways, extrapyramidal pathways, somatic sensitivity pathways, olfactory pathways, optical pathways, taste

pathways, acoustic pathways.

Organization of the autonomic nervous system. Orthosympathetic and parasympathetic nervous system.

Receptors and sense organs. Anatomy of visual function, taste and smell

sense (individual variability of taste and olfactory functions; sensory mechanisms implicated in individual eating behavior); anatomy of hearing and balance.

Vascularization of the central nervous system, ventricular cavities, meninges, blood-brain barrier.

Teaching methods

The course lasts about 12 weeks (4 hours of lessons per week). Lessons will be performed by using Power Point presentations.

Reccomended or required readings

One of the following books is recommended to study:

Alessandro Vercelli, Marina Boido, Giuseppe Bertini et al.
Neuroanatomia Funzionale
Ed. Idelson-Gnocchi

Frederic H. Martini, Robert B. Tallitsch, Judi L. Nath
Anatomia Umana
Ed. EdiSES Università

John A. Kiernan & Nagalingam Rajakumar
Barr: Il Sistema Nervoso dell'Uomo. Basi di Neuroanatomia
Ed. EdiSES Università

Estomih Mtui, Gregory Gruener, Peter Dockery
FitzGerald – Neuroanatomia con riferimenti funzionali e clinici
Ed. Edra

Assessment methods

Examination: the student can perform the examination orally by discussing the topics proposed by the teacher. The knowledge of the topics of the course, the ability to link different topics, the expressive capacity, the use of suitable terminology, the consequentiality in the content connection, the ability to synthesize are evaluated. The grade is expressed in thirtieths, based on the answers given by the student on the different topics proposed during the exam. In alternative, the examination may be performed through two written tests in itinere. In this case, the final grade is the mean of the individual grades awarded in the two tests.

Further information

Knowledge and comprehension:
Acquisition of critical tools and familiarity with issues related to general organization of the nervous system, topographic neuroanatomy and neuronal systems.

Application skills:
Self-directed and guided activities for the systematization of knowledge by recognizing the different nervous structures through the use of atlases and schematic illustrations of sections of the central nervous system.

Autonomy of judgment:
Autonomous and guided recognition of regions and nuclei in sections of human brain.

Communication skills:
Acquisition of the ability to describe in essential, complete and appropriate lexicon the organization of the subdivisions of the central and peripheral nervous system and the immediate relationships between the functional activity of the nerve components and the peripheral innervation territories. Use of specific language (nomenclature and terminology) of neuroanatomy. Demonstration of understanding the knowledge learned through oral communication.

Learning skills:
Essential theoretical knowledge of the structure of neurons and glia, and of the organization of the different neuronal systems acquired by advanced neuroanatomy books.

Sustainable development goals - Agenda 2030

[The goals](#)