



Medicine and Surgery degree course
Integrated Course: **NEUROLOGICAL SCIENCES**
Number of Credits: **6 ECTS**

Module: **Neurology**

SDS MED/26

Number of Credits: **4 ECTS**

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PREREQUISITES

It would be desirable that the student has already acquired the basic notions on Neuroanatomy and Neurophysiology.

LEARNING OBJECTIVES

We propose an integrated course aimed at translating from basic to clinical knowledge.

This interdisciplinary course will bridge different subspecialties into an integrated and comprehensive program. By completion of the program, students will have adequate knowledge of the main neurological diseases, their pathophysiology and treatment.

Together with the knowledge of the main neurological diseases (in order to identify and guide therapeutic choices), this course will provide skills: to acquire the basis of neurological semeiotics; to get confidence on instrumental and biochemical diagnostic elements (CSF analysis; imaging interpretation, etc.); to obtain the essential rudiments for understanding the role of genetics and molecular biology in neurological diseases. In addition the medical students will get the experience able to handle modern neurology, in forms of seminar, dealing with:

- I. The evolution of neurology.
- II. Neurology in the multi-morbidity of the elderly.
- III. Brain death: ethical and legislative aspects.
- IV. Is the brain a network? The default systems, the mirror neurons.
- V. The neurologist and pandemic infections; from HIV to SARS-2.
- VI. Experimental trials and neuroprotective strategies.

LEARNING OUTCOMES

At the end of the course the student must be able to know the basic directions of diagnosis and therapy of the main pathologies of the central SN of neurological interest; besides, he/she will acquire the basic competence to deal with neurological emergencies and to utilize the key semeiotic tools. Further, he/she will be capable to address properly the anatomo-physiological-clinical correlations, which lead to proper diagnosis and therapy path.

COURSE SYLLABUS

At the end of the Neurology course, any candidate will acquire competence around the main neurological diseases, including: epilepsy; headache; stroke; neuro-inflammatory diseases including multiple sclerosis; infections of the nervous system; spinal cord diseases; diseases of the cerebellum, including ataxias; Parkinson's and Parkinsonisms; dementias; dystonia; myasthenia; muscular dystrophies and other myopathies; diseases of the motor neuron; inflammatory, metabolic, toxic and hereditary mono- and poly-neuropathies; headaches / migraines; sleep disorders; alterations of consciousness, syncope, coma, brain death.

COURSE STRUCTURE

The course is divided into lectures, divided between 4CFU in neurology and 2CFU in neurosurgery. Teachers make use of teaching tools such as slides with explanatory diagrams, illustrations and images. Films and animations will be used to integrate the processes described in class. Interactive tests will be organized.

Attendance is compulsory. At the end of Neurology course, students will be asked to complete a written text, with the aim to disclose the main arguments of the future examinations (hence, helping the awareness of each student's preparation).

COURSE GRADE DETERMINATION

The evaluation parameters that will be used, among others, will be: ability to gather and organize knowledge; critical thinking skills; quality of exposure, competence in the use of specialized vocabulary, effectiveness, linearity). It is required a good performance in the written text that precedes the oral exam. The examination will include, at first, a written test. The last is composed by 20 multiple choices questions and 2 brief free topics. Each valid answer to the 20 questions has the value of 1 ; the free topic requires a brief effective written explanation, each one representing 5 points. Hence, overall, 30/30. Only candidates reaching at least 18/30 will gain access to the oral exam.

OPTIONAL ACTIVITIES

Extra sessions may be organized to deliver further arguments on-line

READING MATERIALS

Updated neurology texts such as the Bergamini (ed. Universo); or the Neurology of Cambier et al. Optional: Principles of Neural Sciences, Kandel et al.

However, the key concept is that the training of the medical students will also benefit from the material provided by the teacher. Prof Stefani will solicit and provide insights with numerous references to modern updated reviews or videos easily accessible on the web; this permits the sharing of neurological semeiotics in a more effective manner, which represents a crucial knowledge necessary for any specialist (with particular reference to those who will work in the emergency room and / or emergency services).

Module: **Neurosurgery**

SDS MED/27

Number of Credits: 2 ECTS

Professor Simone Peschillo **email:** simone.peschillo@unicamillus.org

PREREQUISITES

It would be desirable that the student has already passed the Pathological Anatomy exam.

LEARNING OBJECTIVES

We propose an integrated course aimed at translating from basic to clinical knowledge.

This interdisciplinary course will bridge different subspecialties into an integrated and comprehensive program. By completion of the program, students will have adequate knowledge of the main neurological diseases, their pathophysiology and treatment.

The Neurosurgery module provides an overview on neurological diseases and of their surgical management. It integrates will diagnostic procedures and technological advancements.

LEARNING OUTCOMES

At the end of the course the student must be able to know the basic directions of diagnosis and therapy of the main pathologies of the central SN of neurosurgical interest such as: malignant and benign brain tumors; cerebral vascular malformations (aneurysms, angiomas and cerebral cavernomas); cranio-encephalic trauma; degenerative diseases of the cervical spine and medullary tumors; hydrocephalus and intracranial hypertension syndrome. Particular emphasis will be placed on traumatic and hemorrhagic pathologies.

COURSE SYLLABUS

The main pathologies of the central SN of neurosurgical interest will be dealt: ischemic and hemorrhagic stroke (aneurysms, angiomas and cerebral cavernomas, hemorrhage in typical location); malignant and benign brain tumors; cranioencephalic trauma; degenerative diseases of the cervical spine and medullary tumors; hydrocephalus and endocranial hypertension syndrome.

Stroke (hemorrhagic and ischemic)	Learning goals: Describe the therapy in the acute phase of stroke; Describe the principal complication of ischemic stroke; Describe the prognosis of a patients with stroke; Describe the therapeutic approach to a patient with stroke. Describe the clinical presentation of a patient with different types of brain hemorrhage; Learn the diagnostic workout; Learn the surgical indications in these patients; Learn which are the main causes of brain hemorrhage; Learn the different surgical approaches; Learn the clinical outcomes of surgery of the brain hemorrhagic patients. Learn how to recognize an acute intracranial hemorrhage on CT and MRI images; Being able to distinguish intraparenchymal hemorrhage from subarachnoid hemorrhage, and subdural hematoma from epidural hematoma;
Brain tumors	Learning goals: Describe the pathophysiology of intracranial tumor formation and expansion; Describe the clinical presentation of a patient with brain tumor; Learn how to diagnose brain tumors; Learn how to treat patients with brain tumors.
Head and spinal trauma	Learning goals: Describe the clinical presentation of a patient with head and spinal trauma; Describe the direct effects of head trauma; Describe the secondary effects of head trauma; Describe the

neuroradiological approach to a patient with head trauma; Describe the management of a patient with head and spinal trauma; Describe the complication of head and spinal trauma.

Spine degenerative pathologies

Learn the surgical indications in these patients; Learn which are the main causes of surgery in the spine; Learn the different surgical approaches; Learn the clinical outcomes of surgery of the spine. Learn to recognize intervertebral disc bulging, protrusion and extrusion; Learn to depict spinal canal and neuroforaminal stenosis.

Hydrocephalus, Functional neurosurgery, Craniostenosis and other malformations

Learn the definitions and surgical indications in these patients

COURSE STRUCTURE

The course is divided into lectures, divided between 4CFU in neurology and 2CFU in neurosurgery. Teachers make use of teaching tools such as slides with explanatory diagrams, illustrations and images. Films and animations will be used to integrate the processes described in class.

Interactive tests will be organized.

Attendance is compulsory.

COURSE GRADE DETERMINATION

The evaluation parameters that will be used, among others, will be: ability to gather and organize knowledge; critical thinking skills; quality of exposure, competence in the use of specialized vocabulary, effectiveness, linearity) it is required a good performance in the written text that precedes the oral exam. The examination will include, at first, a written test. The last is composed by 20 multiple choices questions and 2 brief free topics. Each valid answer to the 20 questions has the value of 1; the free topic requires a brief effective written explanation, each one representing 5 points. Hence, overall, 30/30. Only candidates reaching at least 18/30 will gain access to the oral exam.

OPTIONAL ACTIVITIES

Extra sessions may be organized to discuss clinical cases.

READING MATERIAL

Handbook of Neurosurgery 9th Edition by Mark S. Greenberg

Fundamentals of Neurosurgery: A Guide for Clinicians and Medical Students 1st ed. 2019 Edition

To learn more about spinal pathologies:

Spine Essentials Handbook: A Bulleted Review of Anatomy, Evaluation, Imaging, Tests, and Procedures Illustrated Edition by Kern Singh (Author)