



COURSE UNIT (MODULE) DESCRIPTION

Course unit (module) title	Code
Neurology and Neurosurgery Part 2	

Academic staff	Core academic unit(s)
Coordinator: Prof. dr. Dalius Jatužis Other(s): other academic staff of the Clinic of Neurology and Neurosurgery	Vilnius University, Faculty of Medicine, Institute of Clinical Medicine, Clinic of Neurology and Neurosurgery, Santariškių str. 2, Vilnius (Center of Neurology, Vilnius University Hospital Santaros klinikos, Santariškių str. 2, Vilnius; Center of Neuroangiosurgery, Republican Vilnius University Hospital, Šiltanamių str. 29, Vilnius; Center of Neurosurgery, Vilnius University Hospital Santaros klinikos, Santariškių str. 2, Vilnius)

Study cycle	Type of the course unit
Integrated studies (cycle I and II)	Compulsory

Mode of delivery	Semester or period when it is delivered	Language of instruction
Face-to-face: lectures and seminars in the auditorium; practical training at the Departments of Neurology and Neurosurgery, in the labs of functional diagnostics and neurosurgical operating rooms.	Semester 8	English

Requisites	
Prerequisites: A student must have completed the following courses: human anatomy, human physiology, pharmacology, pathology, general medicine propedeutics and fundamentals of nursing.	Co-requisites (if relevant): None

Number of ECTS credits allocated	Student's workload (total)	Contact hours	Individual work
5 credits	135 hours	66	69

Purpose of the course unit		
Students must know the principles of neuroanatomy, the main symptoms and syndromes of impairment of the central and peripheral nervous system. They must be able to recognize and assess the general and focal neurological clinical signs and symptoms, to evaluate the level of consciousness and mental state of the patient. They must know the indications of modern diagnostic methods in neurology (ultrasound of cerebral blood vessels, computer tomography (CT) and magnetic resonance imaging (MRI) of brain and spine, electroencephalography (EEG), electroneuromyography (ENMG), angiography). Students must know the clinical manifestations, principles and methods for prevention, diagnosis, and treatment of the main neurological and neurosurgical diseases.		
Learning outcomes of the course unit	Teaching and learning methods	Assessment methods

Generic competences At the end of the study programme, students will be able to:		
act fairly and according to ethical obligations; be empathetic; think critically and self-critically; be creative and take the initiative; reach personal targets; and communicate with others.	Practical training at the Departments of Neurology and Neurosurgery, in the labs of functional diagnostics and neurosurgical operating rooms.	Continuous assessment of practical training at the Departments of Neurology and Neurosurgery, in the labs of functional diagnostics and neurosurgical operating rooms.
make an assessment within the scope of one's competence and, if necessary, ask for help; solve problems and make judgements; communicate and work in a team with specialists of other fields and experts of other scientific areas.	Practical training at the Departments of Neurology and Neurosurgery, in the labs of functional diagnostics and neurosurgical operating rooms.	Continuous assessment of practical training at the Departments of Neurology and Neurosurgery, in the labs of functional diagnostics and neurosurgical operating rooms.
Subject-specific competences At the end of the study programme, students will be able to:		
take a history from the patient with neurological disease, evaluate the complaints, carry out physical and neurological examination; to make clinical judgements and decisions for further diagnostics and treatment options; to provide explanations and advice for the patients.	Practical training at the Departments of Neurology and Neurosurgery, the analysis of clinical cases during seminars and practical training at the Departments of Neurology and Neurosurgery.	Continuous assessment of the analysis of clinical cases during seminars and practical training at the Departments of Neurology and Neurosurgery. Written examination at the end of the course.
recognize and assess the general and focal neurological clinical signs and symptoms, to evaluate the level of consciousness and mental state of the patient, to assess the signs of meningeal irritation; to recognize, assess and know the principles of first aid in neurological emergencies.	Lectures and practical training in the auditory rooms at the Departments of Neurology and Neurosurgery.	Continuous assessment of the acquisition of practical skills during practical training at the Departments of Neurology and Neurosurgery. Written examination at the end of the course.
know the indications of modern diagnostic methods in neurology (ultrasound of cerebral blood vessels, computer tomography (CT) and magnetic resonance imaging (MRI) of brain and spine, electroencephalography (EEG), electroneuromyography (ENMG), angiography).	Lectures and practical training at the Departments of Neurology and Neurosurgery, in the labs of functional diagnostics.	Continuous assessment of practical training at the Departments of Neurology and Neurosurgery, and diagnostic labs. Written examination at the end of the course.
know the main principles and methods of treatment of neurological disorders, medication, and physiotherapy, as well as the main principles and measures of preventing neurological diseases.	Lectures, seminars and practical training at the Departments of Neurology and Neurosurgery.	Continuous assessment of practical training at the Departments of Neurology and Neurosurgery. Written examination at the end of the course.
know the main principles and methods of treatment of neurosurgical disorders.	Lectures, seminars and practical training at the Department of Neurosurgery and operating rooms.	Continuous assessment of practical training at the Department of Neurosurgery. Written examination at the end of the course.

	Contact hours	Individual work: time and assignments
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Content	Lectures	Tutorials	Seminars	Workshops	Laboratory work	Internship	Contact hours, total	Individual work	Tasks for individual work
1. Alzheimer's disease, other dementias and cognitive disorders.			2	3			5	6	Prepare for the practical training by studying the following topics: Dementia: description, classification, criteria, clinical features, and treatment characteristics. Alzheimer's disease. Vascular dementia. Dementia with Lewy bodies. Frontotemporal dementias. Paraclinical tests for the diagnosis of dementia.
2. Consciousness and its disorders.				1			1	2	Prepare for the practical training by studying the following topics: The concept of consciousness. Quantitative and qualitative disorders of consciousness. Delirium. Coma, causes. Assessment of consciousness according to the Glasgow Coma Scale. Examination of a patient in a coma. Long-term disorders of consciousness: vegetative state, locked-in syndrome, akinetic mutism. Brain death.
3. Epilepsy.	1		1	2			4	4	Prepare for the practical training by studying the following topics: Concepts of epilepsy and epileptic seizures. Epileptic and non-epileptic seizures. Provoked, unprovoked, and reflex seizures. Diagnostic criteria for epilepsy. Classification of epileptic seizures. Etiological classification of epilepsy. Clinical features, diagnosis, differential diagnosis, and treatment principles of epilepsy. Electroencephalography. Status epilepticus. Differences between syncope and epileptic seizures.
4. Sleep disorders.	1		1				2	2	Prepare for the practical training by studying the following topics: Phases of sleep. Investigations of sleep. Sleep disorders.
5. Infectious diseases of the nervous system. Autoimmune encephalitis.	2		3	2			7	7	Prepare for the practical training by studying the following topics: Terms: meningitis, encephalitis, myelitis, brain abscess, subdural empyema. Infectious diseases of the nervous system. Meningeal symptoms. Main characteristics and changes in cerebrospinal fluid. Meningitis, classification: viral, bacterial, purulent,

									serous. Encephalitis, classification: primary, secondary; tick-borne, herpetic encephalitis. Brain abscess. Spinal epiduritis. Acute poliomyelitis. Neuroborreliosis. Neurosyphilis. CNS disorders related to HIV infection. Autoimmune encephalitis.
6. Neuromuscular and motor neuron diseases. Muscular dystrophies. 2nd colloquium in neurology	2		2	3			7	7	Prepare for the practical training by studying the following topics: Neuromuscular disorders. Diseases of motoneuron: amyotrophic lateral sclerosis, familial spastic paraplegia (Strümpell-Lorrain disease), inherited spinal muscular atrophies (Werdnig-Hoffmann, Kugelberg-Welander). Inflammatory and metabolic muscle diseases. Muscle dystrophies. Disorders of the neuromuscular junction. Myasthenia. Myotonic disorders. Electroneuromyography.
7. Overview of neurosurgery. Neurophysiology.	2						2	3	Prepare for the practical training by studying the following topics: Quantitative and qualitative assessment of consciousness, scales. Coma. Swelling and oedema of the brain. Cerebrovascular autoregulation. Intracranial hypertension. Herniations of the brain.
8. Craniocerebral trauma	1		2	3			6	4	Prepare for the practical training by studying the following topics: Craniocerebral trauma. Examination of the patient. Epidemiology. Symptoms of mild, medium, and severe brain injuries. Diffuse and local brain injuries. Intracranial bleeding. Diagnosis, assessment of radiological examinations. Treatment methods, principles of conservative treatment, indications for surgical treatment, types of surgery, outcomes, prognosis.
9. Brain tumours	2		1	2			5	4	Prepare for the practical training by studying the following topics: Brain tumours: classification, epidemiology, general and focal neurological symptoms. Supratentorial, infratentorial, sellar and pontocerebellar tumours: clinical symptoms, diagnosis. Supplementary diagnostic methods. Principles of treatment. Indications for surgery, types of surgery, outcomes, prognosis.

10. Cerebrovascular diseases.	1		2	1			4	4	Prepare for the practical training by studying the following topics: Arterial aneurysms, arteriovenous shunts and malformations. Epidemiology, etiology, pathogenesis. Spontaneous subarachnoid hemorrhage. Arterial vasospasm. Carotidocavernous fistulae (shunt). Clinical symptoms of arteriovenous malformations. Diagnosis, assessment of radiological examinations. Methods of treatment: principles of conservative therapy, indications and optimal time period for surgery, types of surgery, postoperative treatment, outcomes, prognosis. Surgical management of spontaneous subarachnoid hemorrhage.
11. Pathology of carotid and vertebral arteries	1		2				3	3	Prepare for the practical training by studying the following topics: Pathology of carotid and vertebral arteries. Clinical symptoms, diagnosis, assessment of radiological examinations. Types of surgery, indications for operations, outcomes.
12. Traumatic spine and spinal cord injury			3	2			5	4	Prepare for the practical training by studying the following topics: Injuries of the spine and spinal cord: vertebral fractures and luxations, injuries of spinal ligaments and muscles, disorders of the intervertebral disc, injuries of the spinal cord. Epidemiology, clinics, diagnostics, treatment methods, surgery principles, outcomes.
13. Degenerative disorders of the spine	1		3	2			6	4	Prepare for the practical training by studying the following topics: Degeneration of spine, degenerative disorders of spine: diseases of intervertebral disc, stenosis, lythesis. Epidemiology, clinical symptoms, diagnosis, treatment, principles of surgery, outcomes
14. Oncological disorders of the spine and spinal cord	1		1	1			3	3	Prepare for the practical training by studying the following topics: The most frequent tumours of the spine and spinal cord (metastases, neurinomas, meningiomas, gliomas, ependymomas), their epidemiology, clinics, diagnosis, methods of treatment, types of operations, outcomes
15. Disturbances of the circulation of cerebrospinal fluid			3	2			5	3	Prepare for the practical training by studying the following topics: Hydrocephalus in adults. Epidemiology, clinics, diagnosis, treatment, principles of surgery, outcomes. Brain atrophy and other degenerative disorders that mimic cerebrospinal fluid circulation disorders. Syringomyelia, hydromyelia.

16. Surgery of peripheral nerves							3	Prepare for these questions: carpal tunnel, cubital tunnel, thoracic outlet syndromes.
17. Functional neurosurgery							3	Prepare for these questions: types of functional neurosurgery in epilepsy, pain and movement disorders.
18. Neurosurgical disorders in children. Neurosurgery colloquium.	1					1	3	Prepare for these questions: nerve tube defects, cerebrospinal fluid circulation disorders, craniosynostosis, neuro-oncological diseases in children.
Total	16		26	24			66	69

Assessment strategy	Weight (%)	Deadline	Assessment criteria
Cumulative grade during practical training (1): practical training at the Departments of Neurology and Neurosurgery, in the labs of functional diagnostics and neurosurgical operating rooms.	20 %	Until the end of the neurology and neurosurgery training	The student must be able to: - take a history from the patient with neurological or neurosurgical disease, evaluate the complaints, to perform a neurological examination; - assess the neurological symptoms, results of laboratory and functional examinations, analyse and synthesise all the information; - make clinical judgements and decisions for further diagnostics and treatment options. The assessment is made on a 10-point scale. The evaluation in neurology goes to the final score after multiplication by the coefficient 0,1. The evaluation in neurosurgery goes to the final score after multiplication by the coefficient 0,1.
Cumulative grade during practical training (2): written colloquiums (tests) – 2 in neurology, 1 in neurosurgery.	30 %	Until the end of the neurology and neurosurgery training	The answers to the given questions of quizzes are assessed according to their comprehensiveness, logicity of presented information and correctness. The assessment is made on a 10-point scale. The average of the evaluation of three quizzes goes to the final score after multiplication by coefficient 0,3.
Examination	50 %	At the end of the neurology and neurosurgery training	The test consists of 60 questions of neurology and neurosurgery: 54 closed-ended questions and 6 open questions, each evaluated in one point. Closed-ended questions are scored from 0 (incorrect) to 1 (completely correct). Open questions are rated from 0 to 1. The examination evaluation score is calculated on the total number of points obtained: 10: Assessment level – 55-60 points. 9: Assessment level – 49-54 points. 8: Assessment level – 43-48 points. 7: Assessment level – 37-42 points. 6: Assessment level – 31-36 points. 5: Assessment level – 25-30 points. 4: Assessment level – 19-24 points. The minimal requirements are not met. 3: Assessment level – 13-18 points. The minimal requirements are not met. 2: Assessment level – 7-12 points. The minimal requirements are not met. 1: Assessment level - ≤6 points. The minimal requirements are not met. The evaluation on a 10-point scale goes to the final score after multiplication by a coefficient of 0,5. If the exam is graded 1-4 points (minimum requirements are not met), the subject is considered unfulfilled, regardless of the cumulative score during the cycle, and it is suggested to retake the examination.

Author(-s)	Publishing year	Title	Issue of a periodical or volume of a publication	Publishing house or web link
Required reading				
V.Budrys (ed.)	2009	Klinikinė neurologija. 2 nd ed.		Vilnius, Vaistų žinios
I.Avižonienė (ed.)	1998	Nervų ligos		Vilnius, Avicena
L.Klumbys	2001	Nervų sistemos chirurgija		Kaunas, Naujasis lankas
Academic staff of the Clinic of Neurology and neurosurgery	2025	Neurology and neurosurgery for medical students (course module)		emokymai.vu.lt
G.Fuller	2019	Neurology Examination Made Easy. 6 th revised edition.		Elsevier
J. Biller, G. Gruener, P. Brazis	2017	DeMyers The Neurologic Examination. 7 th edition.		McGraw-Hill Education
Recommended reading				
M. Endzinienė, G. Jurkevičienė, K. Laučkaitė ir kt.	2019	Neurologijos pagrindai. Antroji pataisyta ir papildyta laida.		Kaunas, LSMU Leidybos namai
M.Baehr, M.Frotscher	2019	Topical Diagnosis in Neurology. Sixth Edition.		Thieme
D. Collins. J. Goodfellow, D. Silva, R. Dardis, S. Nagaraja	2018	Neurology & Neurosurgery		JP medical publishers
V.Budrys (red.)	2011	Urgentinė neurologija		Vilnius, Vaistų žinios
A.H.Ropper, M.A.Samuels, J.P.Klein, S.Prasad (eds.)	2019	Adams and Victor's Principles of Neurology. 11 th ed.		New York, McGraw-Hill Education
M.S.Greenberg	2010	Handbook of neurosurgery. 7 th ed.		Thieme