Ministry of Science and Higher Education of the Russian Federation
Federal State Autonomous Institution of Higher Education
"National Research Nuclear University "MEPhI"

INSTITUTE OF ENGINEERING PHYSICS FOR BIOMEDICINE

DEPARTMENT OF FUNDAMENTAL MEDICINE

APPROVED НТС ИФИБ

Protocol No. 3.1

dated 30.08.2024

ACADEMIC COURSE OUTLINE

НЕВРОЛОГИЯ, НЕЙРОХИРУРГИЯ, МЕДИЦИНСКАЯ ГЕНЕТИКА / NEUROLOGY, MEDICAL GENETICS, NEUROSURGERY

Educational program track (speciality) [1] 31.05.01 General Medicine

Semester	**Labour input, credits**	**Total course academic, hours**	**Lectures, hrs.**	**Practical sessions, hrs.**	**Laboratory sessions, hrs.**	**In the form of practical studies, hrs.**	**Independent studies, hrs.**	**Independent studies monitoring, hrs.**	**Course progress, Exam/Pass-fail exam/Term**
7	3	108	20	60	0		28	0	PFE
8	5	180	20	60	0		64	0	Ex
Total	8	288	40	120	0	120	92	0	

ABSTRACT

This syllabus has been developed in accordance with the requirements for the learning outcomes of the specialist degree program. A graduate (physician in General Medicine) must be prepared to solve tasks related to the diagnosis, treatment, and prevention of diseases.

Throughout the course of study, students develop knowledge, skills, and abilities in diagnosing, treating, and preventing major diseases of the nervous system, including hereditary disorders. Students master the methods of examining patients with neurological pathologies, learn to interpret laboratory and instrumental test results related to the structures of the nervous system, and study the principles of establishing a neurological diagnosis, managing neurological patients, and selecting optimal treatment strategies.

1. ACADEMIC COURSE GOALS AND OBJECTIVES

Aim:

To develop competencies in the diagnosis, treatment, and prevention of the most common diseases of the nervous system, including hereditary disorders.

Objectives:

• To acquaint students with the principles of organization and operation of healthcare facilities providing care to patients with neurological, neurosurgical, and neurogenetic pathologies.

• To build a systematic knowledge of the etiology, epidemiology, pathogenesis, and risk factors for nervous system diseases.

• To develop the skills and abilities for objective examination of neurological patients to enable timely diagnosis of nervous system lesions.

• To foster the ability to identify and recognize clinical signs of neurological pathology, determine the severity of the pathological process, and identify the leading syndromes of neurological diseases, traumatic brain injury, tumors of the brain and spinal cord, as well as hereditary and neurogenetic diseases.

• To develop the skills and abilities for creating examination and treatment plans for neurological patients, and for interpreting the results of additional tests in accordance with clinical guidelines to establish a diagnosis for major neurological diseases, traumatic brain injury, tumors of the brain and spinal cord, and hereditary and neurogenetic diseases, including the development of a differential diagnosis algorithm.

• To develop the skills and abilities for providing emergency medical care in neurology and for determining indications for the hospitalization of neurological patients.

• To develop the skills and abilities for selecting optimal etiopathogenetic treatment regimens for the most common neurological diseases, traumatic brain injury, tumors of the brain and spinal cord, and hereditary and neurogenetic diseases.

• To develop the skills and abilities for performing the full range of therapeutic, rehabilitative, and preventive measures for patients with various nosological forms of neurological diseases.

• To develop the skills and abilities for implementing preventive measures aimed at preventing the development of nervous system diseases, their complications, and recurrences.

• To develop skills for communicating with patients, adhering to the principles of ethics and medical deontology, and for effective interaction with colleagues.

• To cultivate clinical thinking, the ability to work with scientific literature, apply regulatory documents in professional activities, and maintain medical records.

2. PLACE OF THE ACADEMIC COURSE IN THE MAIN HIGHER EDUCATION CURRICULUM

For the successful mastery of this discipline, knowledge, skills, and abilities formed during the study of the following prerequisite disciplines are required: Medical Microbiology and Virology, Immunology, Pathological Anatomy, Pathophysiology, Pharmacology, General Surgery, Propaedeutics of Internal Medicine, and Diagnostic Radiology.

The knowledge, skills, and abilities acquired as a result of studying this discipline are essential for solving professional tasks related to the diagnosis, treatment, and prevention of diseases.

3. DEVELOPED COMPETENCIES AND INTENDED LEARNING OUTCOMES

Universal and/or general professional competencies:

Competency code and title	**Code and title of competency-based rubrics**
ОПК-4 [1] – Capable of using medical devices stipulated by the medical care procedures, as well as conducting patient examination for diagnosis establishment.	З-ОПК-4 [1] – Know: - modern diagnostic instrumental examination methods for patients, including functional, radiological, ultrasound, radionuclide diagnostics, and endoscopy; - diagnostic capabilities of instrumental examination methods; - medical devices stipulated by the procedure for providing medical care to the adult population in the "Therapy" specialty, and the equipment standard for a therapeutic room; - main medical devices stipulated by the procedures for providing medical care to the adult population in major surgical specialties, obstetrics, and gynecology; - indications for referring patients for instrumental examinations and functional diagnostics; - techniques for physical examination of patients using medical devices stipulated by procedures and considering medical care standards У-ОПК-4 [1] – Be able to: - use medical devices stipulated by the medical care procedure; - determine the required volume and content of instrumental and functional diagnostics to establish a diagnosis; - interpret results of the most common functional and instrumental diagnostic methods В-ОПК-4 [1] – Possess skills in: - using basic medical devices (stethoscope, blood pressure monitor, sphygmomanometer, pulse oximeter, height-weight scale, measuring tape, neurological hammer, scalpel, forceps, and other devices); - operating electrocardiographs and devices for measuring external respiratory function; - interpreting results of the most common functional and instrumental diagnostic methods
ОПК-6 [1] – Capable of organizing general nursing, providing primary medical care, ensuring the organization of work and making professional decisions in emergencies at the pre-hospital stage, in emergency situations,	З-ОПК-6 [1] – Know: - a set of measures for general nursing with diseases of various organs and systems; Signs of clinical and biological death; - indications for patient hospitalization for the most common diseases with typical progression. У-ОПК-6 [1] – Be able to: - organize care for patient when providing medical care in an outpatient setting; - determine the need for patient hospitalization; - ensure the organization of work

epidemics and in areas of mass destruction	in emergency situations, epidemics, and in mass casualty zones. В-ОПК-6 [1] – Possess skills in: - general care of a patient (general nursing); - providing first aid; - making medical decisions in emergencies at the prehospital stage, including in emergency situations, epidemics, and in mass casualty zones.
ОПК-7 [1] – Capable of prescribing treatment and monitoring its effectiveness and safety.	З-ОПК-7 [1] – Know: - pharmacological groups of medicinal drugs and their intended purposes; - mechanisms of action of pharmacological and non-pharmacological treatments, indications and contraindications for their use, side effects, and complications caused by their application; - methods for monitoring the effectiveness and safety of various treatment approaches. У-ОПК-7 [1] – Be able to: - make rational choices for pharmacological and non-pharmacological treatments based on clinical guidelines and in accordance with medical care standards; - develop a treatment plan for a disease or condition considering the diagnosis, age, disease course characteristics, and comorbidities, based on clinical guidelines and medical care standards; - prescribe medications, medical devices, and therapeutic nutrition considering the diagnosis, age, disease course characteristics, and comorbidities, based on clinical guidelines and medical care standards; - justify prescribed pharmacological and non-pharmacological treatments; - evaluate the effectiveness and safety of medications, medical devices, therapeutic nutrition, and other treatment methods. В-ОПК-7 [1] – Possess skills in: - administering medications through various routes of administration; - developing treatment plans for diseases or conditions considering diagnosis, age, disease course characteristics, and comorbidities; - assessing the effectiveness and safety of prescribed treatments.

Professional competencies in compliance with the goals and professional knowledge areas:

Professional activity goal	**Professional activity knowledge area**	**Professional competency code and title; Based on the professional standard, experience analysis**	**Code and title of competency-based rubrics**
medical			
Diagnostics of diseases and pathological conditions of the patients.	Individuals (patients); the population; the set of means and technologies aimed at creating conditions for preserving and strengthening the health of the adult population	ПК-3.2 [1] - Capable of conducting patient examinations to establish a diagnosis *The base:* Professional standard: 02.009	З-ПК-3.2[1] - Know: - clinical diagnosis establishment algorithm; - patient history-taking and physical examination methodology; - laboratory and instrumental research methods for health assessment to establish a diagnosis; - semiotics of

			diseases of different organs and systems; - structure, principles of the current International Statistical Classification of Diseases and Related Health Problems (hereinafter - ICD).; У-ПК-3.2[1] - Be able to: - conduct patient history-taking and physical examination; - interpret history, physical examination data, laboratory and instrumental results to recognize a condition or establish the presence/absence of a disease, establish a diagnosis; - distinguish and recognize in each specific case tissue damage, the reaction to it, and the form of adaptability; - develop a patient examination plan, justify the necessity and scope of laboratory and instrumental examination; - identify main pathological conditions, symptoms and syndromes, nosological forms in the patient according to the current ICD.; В-ПК-3.2[1] - Possess skills in: - patient history-taking and physical examination; Formulating a preliminary diagnosis; - developing a patient examination plan; Interpreting laboratory and instrumental results; - establishing a diagnosis considering the current ICD
Providing primary medical care in outpatient settings and day hospital settings.	Individuals (patients); the population; the set of means and technologies aimed at creating conditions for preserving and	ПК-3.3 [1] - Able to provide primary medical care in an outpatient setting *The base:*	З-ПК-3.3[1] - Know: - general issues of organizing medical care for the population and organizing medical care for the adult population in

	strengthening the health of the adult population	Professional standard: 02.009	outpatient settings, including at home; - features of medical care using telemedicine technologies; - Clinical picture, differential diagnosis, features of the course of the disease, complications and outcomes of internal diseases; - diagnostic criteria for the most common diseases of internal organs and systems; - indications for referring patients for specialist consultations according to clinical guidelines and considering relevant medical care standards; - indications for referring patients for specialized medical care in inpatient settings and day hospitals according to clinical guidelines and considering relevant medical care standards; - features of managing and treating elderly patients in outpatient settings. ; У-ПК-3.3[1] - Be able to: - perform differential diagnosis of internal diseases; - monitor the course of physiological pregnancy; - justify the need for referring patients to specialist consultations; - recognize the main and concomitant diseases; - assess disease or condition severity - the degree of organ and/or system damage or functional impairment due to the disease/condition or its complications; - determine management, examination and treatment tactics for patients with specific diseases (nosological units)

			depending on disease severity and condition, according to clinical guidelines and considering relevant medical care standards.; В-ПК-3.3[1] - Possess skills in: - conducting differential diagnosis with other diseases/conditions, including emergencies; - interpreting data obtained from patient consultations with specialists; - prescribing additional tests to clarify the diagnosis; - formulating a clinical diagnosis; - prescribing treatment according to clinical guidelines and considering relevant medical care standards.

4. PEDAGOGIC POTENTIAL OF THE COURSE

Pedagogic tracks/objectives	**Pedagogic goals (code)**
Professional education	Establishing conditions for: formation of responsibility for professional choice, professional development and professional decisions (B18)
Professional education	Establishing conditions for: formation of motivation to improve the quality of medical care to the population and the desire to follow the rules and norms of interaction between the doctor, colleagues and the patient, contributing to the creation of the most favorable environment for the patient's recovery (B34)

5. ACADEMIC COURSE STRUCTURE AND CONTENT

Academic course sections, their scope, terms of study and assessment:

No.	**Academic course section name**	**Weeks**	**Lectures/ Practical (seminars)/ Laboratory sessions, hrs.**	**Compulsory current assessment (form*, week)**	**Maximum grade per section****	**Section assessment (form*, week)**	**Competency-based rubrics**
	7 Semester						
1	Part One	1-6	8/24/0	SA-6	25	SA-6	3-ОПК-4,

				(25)			У-ОПК-4, В-ОПК-4, З-ОПК-6, У-ОПК-6, В-ОПК-6, З-ОПК-7, У-ОПК-7, В-ОПК-7, З-ПК-3.2, У-ПК-3.2, В-ПК-3.2, З-ПК-3.3, У-ПК-3.3, В-ПК-3.3
2	Part Two	7-15	12/36/0	SA-15 (25)	25	SA-15	З-ОПК-4, У-ОПК-4, В-ОПК-4, З-ОПК-6, У-ОПК-6, В-ОПК-6, З-ОПК-7, У-ОПК-7, В-ОПК-7, З-ПК-3.2, У-ПК-3.2, В-ПК-3.2, З-ПК-3.3, У-ПК-3.3, В-ПК-3.3
	Totals for 7 Semester		20/60/0		50		
	Assessment events for 7 Semester				50	PFE	У-ОПК-4, В-ОПК-4, З-ОПК-4
	8 Semester						
1	Part One	1-6	8/24/0	SA-6 (25)	25	SA-6	З-ОПК-4, У-ОПК-4, В-ОПК-4, З-ОПК-6, У-ОПК-6, В-ОПК-6, З-ОПК-7, У-ОПК-7, В-ОПК-7, З-ПК-3.2, У-ПК-3.2, В-ПК-3.2, З-ПК-3.3, У-ПК-3.3, В-ПК-3.3
2	Part Two	7-15	12/36/0	SA-15 (25)	25	SA-15	З-ОПК-4, У-ОПК-4, В-ОПК-4,

							З-ОПК-6, У-ОПК-6, В-ОПК-6, З-ОПК-7, У-ОПК-7, В-ОПК-7, З-ПК-3.2, У-ПК-3.2, В-ПК-3.2, З-ПК-3.3, У-ПК-3.3, В-ПК-3.3
	Totals for 8 Semester		20/60/0		50		
	Assessment events for 8 Semester				50	Ex	З-ОПК-4, У-ОПК-4, В-ОПК-4, З-ОПК-6, У-ОПК-6, В-ОПК-6, З-ОПК-7, У-ОПК-7, В-ОПК-7, З-ПК-3.2, У-ПК-3.2, В-ПК-3.2, З-ПК-3.3, У-ПК-3.3, В-ПК-3.3

* – abbreviated name of assessment

** – 100 maximum points per semester including a pass/fail exam and (or) an exam

Abbreviated current assessment forms and section assessment

Abbreviation	**Full name**
SA	Summative assessment
PFE	Pass/fail examination
Ex	Exam

SYLLABUS

Weeks	**Topics / Content**	**Lect., hrs.**	**Pr./sem., hrs.**	**Lab., hrs.**
	7 Semester	20	60	0
1-6	**Part One**	8	24	0
1	**Introduction to Neurology**	All		
	Introduction to Neurology	1	4	0
	Neurosciences, the place of neurology among other medical disciplines.	Online		
		0	0	0
2	**General Concepts of Neurology as a Science**	All		
	General Concepts of Neurology as a Science	1	4	0

	Organization of neurological care services, current legislative issues.	Online		
		0	0	0
3	**Phylogenesis and Ontogenesis of the Nervous System** Phylogenesis and Ontogenesis of the Nervous System Development of the nervous system in phylo- and ontogenesis, nervous system malformations.	All		
		1	4	0
		Online		
		0	0	0
4	**Sensory System** Sensory System Organization of the sensory system, functional anatomy of sensory pathways, symptoms of lesions at different levels.	All		
		1	4	0
		Online		
		0	0	0
5	**Motor System** Motor System Organization of the motor system, functional anatomy of motor act formation, symptoms of motor pathway lesions at different levels.	All		
		2	4	0
		Online		
		0	0	0
6	**Cranial Nerves** Cranial Nerves Anatomy of cranial nerves, their structure and function. Key symptoms of cranial nerve lesions and their use in diagnosing CNS lesion levels.	All		
		2	4	0
		Online		
		0	0	0
7-15	**Part Two**	12	36	0
7	**Extrapyramidal System, Cerebellum, Spinal Cord** Extrapyramidal System, Cerebellum, Spinal Cord Organization of the brain's extrapyramidal system, main structures, their functions, symptoms and syndromes of their lesions.	All		
		2	4	0
		Online		
		0	0	0
8	**Spinal Cord and Brainstem Lesions** Spinal Cord and Brainstem Lesions Structure and function of the spinal cord, segmental organization. Key symptoms and syndromes of cerebral cortex lesions.	All		
		2	4	0
		Online		
		0	0	0
9	**Cerebral Cortex** Cerebral Cortex Structure and function of cerebral cortical structures, the concept of a neural analyzer, functional division of the cerebral cortex according to Brodmann. Key symptoms and syndromes of cerebral cortex lesions.	All		
		2	4	0
		Online		
		0	0	0
10	**Autonomic Nervous System** Autonomic Nervous System Autonomic nervous system, structure, features, characteristics of main mechanisms. Disorders of the autonomic nervous system.	All		
		1	4	0
		Online		
		0	0	0
11	**Meninges**	All		

	Meninges Structure and function of the brain meninges, symptoms and syndromes arising from meningeal lesions, lumbar puncture, cerebrospinal fluid and its analysis.	1	4	0
		Online		
		0	0	0
12	**MRI of the Brain** MRI of the Brain Methods of MRI diagnostics for nervous system diseases, modern diagnostics of intracranial space-occupying lesions.	All		
		1	4	0
		Online		
		0	0	0
13	**Pain and Its Manifestations** Pain and Its Manifestations Definition of pain, pain symptom and syndrome, pain mechanisms, types of pain disorders.	All		
		1	4	0
		Online		
		0	0	0
14	**Neurological Examination of a Patient** Neurological Examination of a Patient Introduction to methods of conducting a neurological examination and maintaining medical records in an outpatient setting.	All		
		1	4	0
		Online		
		0	0	0
15	**Final Session** Final Session Final testing on the topics covered.	All		
		1	4	0
		Online		
		0	0	0
	8 Semester	20	60	0
1-6	**Part One**	8	24	0
1	**General Introduction to Nervous System Diseases** General Introduction to Nervous System Diseases Nervous system diseases in the population, medical statistics, classification of neurological diseases.	All		
		1	4	0
		Online		
		0	0	0
2	**Organization of a Neurology Department** Organization of a Neurology Department Structure and function of a neurology department, patient hospitalization, conditions of stay, department workflow.	All		
		1	4	0
		Online		
		0	0	0
3	**Cerebrovascular Diseases** Cerebrovascular Diseases Structure of the vascular system of the brain and spinal cord, developmental anomalies, pathology of nervous system blood supply.	All		
		1	4	0
		Online		
		0	0	0
4	**Neurogenetic Diseases** Neurogenetic Diseases Introduction to neurogenetic diseases using examples like PD, GCD, MSA, etc. Organization of therapy.	All		
		1	4	0
		Online		
		0	0	0
5	**Neuromuscular Diseases** Neuromuscular Diseases Introduction to neuromuscular diseases using examples like myasthenia gravis, myopathies; inheritance and transmission.	All		
		2	4	0
		Online		
		0	0	0

6	**Peripheral Nervous System Diseases** Peripheral Nervous System Diseases Introduction to pathological conditions of the peripheral nervous system, formation of mononeuropathies, polyneuropathies.	All		
		2	4	0
		Online		
		0	0	0
7-15	**Part Two**	12	36	0
7	**Traumatic Brain Injury** Traumatic Brain Injury Introduction to the organization of diagnosis and treatment of head injuries, classification, organization of medical care.	All		
		2	4	0
		Online		
		0	0	0
8	**Inflammatory Diseases of the Nervous System** Inflammatory Diseases of the Nervous System Inflammatory diseases of the brain meninges and brain tissue, diagnostic and treatment strategies.	All		
		2	4	0
		Online		
		0	0	0
9	**Nervous System Tumors** Nervous System Tumors Introduction to the diagnosis and treatment of brain tumors, classification, conservative and surgical treatment, rehabilitation.	All		
		2	4	0
		Online		
		0	0	0
10	**Dorsopathies** Dorsopathies Classification of dorsopathies, diagnostic methods, organization of treatment measures.	All		
		1	4	0
		Online		
		0	0	0
11	**Neuroinfectious Diseases** Neuroinfectious Diseases Diagnosis and therapy of multiple sclerosis, features of modern treatment.	All		
		1	4	0
		Online		
		0	0	0
12	**Epilepsy** Epilepsy Diagnosis, classification of epilepsies, basic principles of drug therapy.	All		
		1	4	0
		Online		
		0	0	0
13	**Nervous System Diseases with Other Primary Pathology** Nervous System Diseases with Other Primary Pathology Nervous system diseases arising from other primary pathologies, intoxication, diabetes, HIV.	All		
		1	4	0
		Online		
		0	0	0
14	**Neurorehabilitation** Neurorehabilitation Organization of neurorehabilitation in a multidisciplinary clinic setting.	All		
		1	4	0
		Online		
		0	0	0
15	**Final Session** Final Session Final assessment of knowledge and skills.	All		
		1	4	0
		Online		
		0	0	0

Abbreviated names of online options:

Abbreviation	**Full name**
EC	E-course

FtM	Full-text material
FtL	Full-text lectures
VM	Video materials
AM	Audio materials
Prs	Presentations
T	Tests
ERM	E-reference materials
IS	Interactive site

PRACTICAL SESSIONS TOPICS

Weeks	**Topics / Content**
	7 Semester
1	**Introduction to Neurology** Introduction to Neurology Neurosciences, the place of neurology among other medical disciplines.
2	**General Concepts of Neurology as a Science** General Concepts of Neurology as a Science General issues of neurological care service organization, current legislative issues.
3	**Phylogenesis and Ontogenesis of the Nervous System** Phylogenesis and Ontogenesis of the Nervous System Development of the nervous system in phylogenesis and ontogenesis, malformations of the nervous system.
4	**Sensory System** Sensory System Organization of the sensory system, functional anatomy of sensory pathway formation, symptoms of sensory pathway lesions at different levels.
5	**Motor System** Motor System Organization of the motor system, functional anatomy of motor act formation, symptoms of motor pathway lesions at different levels.
6	**Cranial Nerves** Cranial Nerves Anatomy of cranial nerves, their structure and function. Key symptoms of cranial nerve lesions and the use of this knowledge in diagnosing the level of CNS lesion.
7	**Extrapyramidal System, Cerebellum, Spinal Cord** Extrapyramidal System, Cerebellum, Spinal Cord Organization of the brain's extrapyramidal system, main structures forming the extrapyramidal system, their functions, symptoms and syndromes of their lesions.
8	**Spinal Cord and Brainstem Lesions** Spinal Cord and Brainstem Lesions Study of the structure and function of the spinal cord, segmental organization. Main symptoms and syndromes of cerebral cortex lesions.
9	**Cerebral Cortex**

	Cerebral Cortex Study of the structure and function of cerebral cortical structures, the concept of a neural analyzer, functional division of the cerebral cortex according to Brodmann. Main symptoms and syndromes of cerebral cortex lesions.
10	**Autonomic Nervous System** Autonomic Nervous System Autonomic nervous system, structure, features, characteristics of main mechanisms. Disorders of the autonomic nervous system.
11	**Meninges** Meninges Study of the structure and function of the brain meninges, symptoms and syndromes arising from meningeal lesions, lumbar puncture, cerebrospinal fluid and its analysis.
12	**MRI of the Brain** MRI of the Brain Study of MRI techniques for diagnosing nervous system diseases, modern diagnostics of intracranial space-occupying lesions.
13	**Pain and Its Manifestations** Pain and Its Manifestations Definition of the concept of pain, pain symptom and syndrome, pain mechanisms, types of pain disorders.
14	**Neurological Examination of a Patient** Neurological Examination of a Patient Introduction to methods of conducting a neurological examination and maintaining medical documentation in an outpatient setting.
15	**Final Session** Final Session Final testing on the topics covered.
	8 Semester
1	**General Introduction to Nervous System Diseases** General Introduction to Nervous System Diseases Nervous system diseases in the population, medical statistics issues, classification of neurological diseases.
2	**Organization of a Neurology Department** Organization of a Neurology Department Structure and function of a neurology department, patient hospitalization, conditions of stay, department workflow.
3	**Цереброваскулярные заболевания** Cerebrovascular Diseases Structure of the vascular system of the brain and spinal cord, issues of developmental anomalies, formation of pathology of the nervous system blood supply.
4	**Neurogenetic Diseases** Neurogenetic Diseases

	Introduction to the group of neurogenetic diseases using examples such as PD, GCD, MSA, etc. Issues of therapy organization.
5	**Neuromuscular Diseases** Neuromuscular Diseases Introduction to neuromuscular diseases using examples such as myasthenia gravis, myopathies; issues of inheritance and transmission.
6	**Заболевания периферической нервной системы** Peripheral Nervous System Diseases Introduction to pathological conditions of the peripheral nervous system, formation of mononeuropathies, polyneuropathies.
7	**Traumatic Brain Injury** Traumatic Brain Injury Introduction to the organization of diagnosis and treatment of head injuries, classification, organization of medical care.
8	**Inflammatory Diseases of the Nervous System** Inflammatory Diseases of the Nervous System Inflammatory diseases of the brain meninges and brain tissue, diagnostic and treatment tactics.
9	**Nervous System Tumors** Nervous System Tumors Introduction to the diagnosis and treatment of brain tumors, issues of classification, conservative and surgical treatment, and rehabilitation.
10	**Dorsopathies** Dorsopathies Classification of dorsopathies, diagnostic methods, organization of treatment measures.
11	**Neuroinfectious Diseases** Neuroinfectious Diseases Diagnosis and therapy of multiple sclerosis, features of treatment at the present stage.
12	**Epilepsy** Epilepsy Diagnosis, classification of epilepsies, basic principles of drug therapy.
13	**Nervous System Diseases with Other Primary Pathology** Nervous System Diseases with Other Primary Pathology Nervous system diseases arising as a consequence of other primary pathologies, intoxication, diabetes, HIV.
14	**Neurorehabilitation** Neurorehabilitation Organization of neurorehabilitation in a multidisciplinary clinic setting.
15	**Final Session** Final Session Final assessment of knowledge and skills.

6. EDUCATIONAL TECHNOLOGIES

• Training formats for practical classes (clinical case scenarios, case studies, role-playing in the form of clinical case analysis or patient management);

• Interactive clinical case analysis with patient demonstrations;

• Involving students in scientific preclinical and clinical research, preparation of presentation materials, reports, essays, or term papers;

• Participation in a student scientific club.

7. ASSESSMENT TOOLKIT

The assessment toolkit ensures verification of the intended learning outcomes achievement (competency-based rubrics) using current, midterm and interim assessment of the course.

The link between developed competencies and their assessment is presented in the following table:

Competency	**Achievement rubrics**	**Assessment activity (Syl 1)**	**Assessment activity (Syl 2)**
ОПК-4	З-ОПК-4	PFE, SA-6, SA-15, КИ-6, КИ-15	Ex, SA-6, SA-15
	У-ОПК-4	PFE, SA-6, SA-15, КИ-6, КИ-15	Ex, SA-6, SA-15
	В-ОПК-4	PFE, SA-6, SA-15, КИ-6, КИ-15	Ex, SA-6, SA-15, КИ-6
ОПК-6	З-ОПК-6	SA-6, SA-15	Ex, SA-6, SA-15, КИ-6, КИ-15
	У-ОПК-6	SA-6, SA-15	Ex, SA-6, SA-15, КИ-6, КИ-15
	В-ОПК-6	SA-6, SA-15	Ex, SA-6, SA-15, КИ-6, КИ-15
ОПК-7	З-ОПК-7	SA-6, SA-15	Ex, SA-6, SA-15, КИ-6
	У-ОПК-7	SA-6, SA-15	Ex, SA-6, SA-15, КИ-6, КИ-15
	В-ОПК-7	SA-6, SA-15	Ex, SA-6, SA-15, КИ-6, КИ-15
ПК-3.2	З-ПК-3.2	SA-6, SA-15	Ex, SA-6, SA-15
	У-ПК-3.2	SA-6, SA-15	Ex, SA-6, SA-15
	В-ПК-3.2	SA-6, SA-15	Ex, SA-6, SA-15
ПК-3.3	З-ПК-3.3	SA-6, SA-15	Ex, SA-6, SA-15
	У-ПК-3.3	SA-6, SA-15	Ex, SA-6, SA-15
	В-ПК-3.3	SA-6, SA-15	Ex, SA-6, SA-15

Educational achievement rubrics scales

The scale of each assessment activity varies from 0 to the maximum established point, inclusive. The final assessment of the course is performed on a 100-point scale and represents the sum of the points earned by the student in the section assessments, framework of current and interim assessment.

Sections and interim assessments are considered passed when the student achieves a minimum score equal to 60% of the maximum. The final grade is assigned only upon passing all sections and the interim assessment.

The final grade is assigned in accordance with the following scale:

<table>
<tr><th>Total score</th><th>Rating on a 4-point scale</th><th>Pass/fail examination</th><th>ECTS assessment</th></tr>
<tr><td>90-100</td><td>5 – «excellent»</td><td rowspan="7">«pass»</td><td>A</td></tr>
<tr><td>85-89</td><td rowspan="3">4 – «good»</td><td>B</td></tr>
<tr><td>75-84</td><td>C</td></tr>
<tr><td>70-74</td><td rowspan="2">D</td></tr>
<tr><td>65-69</td><td rowspan="2">3 – «satisfactory»</td></tr>
<tr><td>60-64</td><td>E</td></tr>
<tr><td>below 60</td><td>2 – «fail»</td><td>«fail»</td><td>F</td></tr>
</table>

An “excellent” grade indicates a deep and solid mastery of the program material by a student who presents their answers consistently, clearly, and logically, is able to closely link theory with practice, and uses materials from monographic literature in their answers.

A “good” grade corresponds to a student’s solid knowledge of the material, who presents their answers competently and to the point, without any significant inaccuracies.

A “satisfactory” grade corresponds to the basic level of mastery of the material by the student, in which the main material has been mastered, but its details have not been assimilated, the answers contain inaccuracies, insufficiently correct wording and logical inconsistencies.

A grade “pass” corresponds to at least a basic level of mastery of the program material, in which the student possesses the necessary knowledge, skills, and abilities, and is able to apply theoretical principles to solve typical practical problems.

A grade “fail” is given to a student who lacks a significant understanding of the curriculum material, makes significant errors in their answers, or fails all required assignments. These students are generally unable to continue their studies without additional classes.

8. ACADEMIC COURSE EDUCATIONAL, METHODOLOGICAL AND INFORMATIONAL SUPPORT

CORE READING:

1. ЭИ G96 Neurology and neurosurgery. Vol. 1. Neurology : учебник, Gusev E.I., Skvortsova V.I., Konovalov A.N., Москва: ГЭОТАР-Медиа, 2023

2. ЭИ G96 Neurology and neurosurgery: in 2 vol. Vol. 2. Neurosurgery : учебник, Skvortsova V. I. [и др.], Москва: ГЭОТАР-Медиа, 2023

3. ЭИ М 42 Медицинская генетика : учебник, Филиппова Т.В. [и др.], Москва: ГЭОТАР-Медиа, 2022

4. ЭИ Б 82 Медицинская генетика : учебное пособие для вузов, Чуваков Г. И., Борисова Т. Н., Москва: Юрайт, 2024

5. ЭИ Н 40 Неврология и нейрохирургия : , Гусев Е.И., Коновалов А.Н., Скворцова В.И., Москва: ГЭОТАР-Медиа, 2022

FURTHER READING:

1. ЭИ Т42 Textbook of Human Anatomy. In 3 vol. Vol. 3. Nervous system. Esthesiology : учебник, , Москва: ГЭОТАР-Медиа, 2018

2. ЭИ К 26 Topical diagnosis of diseases of the nervous system = Топическая диагностика заболеваний нервной системы : учебник, Карпов С.М., Долгова И.Н., Москва: ГЭОТАР-Медиа, 2018

SOFTWARE:

1. Microsoft Office 2016+ ()

LMS AND ONLINE RESOURCES

1. Электронный гистологический атлас (https://histologyguide.com/)

2. https://online.mephi.ru/2 part Biology ()

3. https://online.mephi.ru/1 part Biology ()

4. 1 part Biology (https://online.mephi.ru/1 part Biology)

5. Электронная библиотека медицинского вуза. (http://www.studmedlib.ru/)

https://online.mephi.ru/

http://library.mephi.ru/

9. LOGISTICAL SUPPORT

1. Демонстрационные модели тела человека (64-402)

2. Демонстрационные модели опорно-двигательного аппрарата (64-402)

3. Демонстрационные модели органов чувств (64-402)

4. Демонстрационные модели нервной системы (64-402)

5. Молоточек неврологический KaWe Colorflex с острием (Клиническая база)

6. Кушетка смотровая (Клиническая база)

7. Динамометр кистевой ДК-140 (Клиническая база)

8. Динамометр становой ДС-200 (Клиническая база)

9. Иное оснащение, предусмотренное порядками оказания медицинской помощи по соответствующему профилю (Клиническая база)

10. Персональный компьютер: Процессор CPU Intel Core i7-8700 (3.2GHz/12MB/6 cores) Материнская плата Gig (Клиническая база)

11. Мышь, клавиатура (Клиническая база)

12. Проектор SMART P109 (Клиническая база)

13. Монитор (Клиническая база)

14. Электроэнцефалограф многоканальный "Нейровизор БММ-52" (64-301)

15. Тренажер для выполнения люмбальной пункции и эпидуральной анестезии (64-302)

10. EDUCATIONAL AND METHODOLOGICAL RECOMMENDATIONS FOR STUDENTS

GUIDELINES FOR SEMINAR PREPARATION

The plan for practical classes, including topics, recommended literature, and the aims and objectives of the discipline, is provided by the instructor during introductory sessions or in the course syllabus. Practical classes are designed to deepen the understanding of the study material and develop skills in working creatively with scientific literature.

Before starting to study a topic, familiarize yourself with the main points of the practical lesson plan and the list of recommended literature.

When beginning preparation for a practical class, first review your lecture notes and the relevant sections in textbooks and study guides to gain a general understanding of the topic's place and significance within the course. Subsequently, work with additional literature and take notes from the recommended sources. While studying the recommended material, strive to understand the structure of the topic, identify key concepts, trace their logical connections, and thus grasp the essence of the subject matter. It is essential to take notes on the material being studied in the form of a summary; this engages motor memory in addition to visual memory and helps build a personal repository of auxiliary materials for quick review and mobilization of accumulated knowledge.

Primary forms of note-taking include outlines (simple and detailed), excerpts, and abstracts. During preparation, it is important to compare sources, contemplate the material, develop an action algorithm, and carefully plan your oral presentation.

CLINICAL PRACTICAL CLASSES

A crucial stage of practical classes is the independent work of students to master practical skills: in simulated environments, at the patient's bedside, in functional diagnostic rooms, etc. Depending on the specific topic of the class, the student independently (or under the supervision of an

instructor) interviews a patient, performs a clinical examination, observes instrumental diagnostic procedures, studies the results of additional tests, summarizes the data, presents it in the form of parts of a medical history, and reports the findings to the instructor. Achievements are assessed individually for each student, based on the level of proficiency in practical skills and their theoretical foundations.

Clinical case analyses of thematic patients are conducted for the entire group or through student participation in clinical case discussions and periodic scientific-practical conferences at the healthcare organizations where practical training takes place. During these analyses, the instructor assesses the active participation of each student and their ability to think clinically.

GUIDELINES FOR PREPARING FOR TESTS

Test: 10 - 15 - 20 - 25 points.

Each question: 1 (or 2) point(s).

Topics: Specified in each respective section.

Answer Requirements: A clear, detailed answer (2 points/task) or selecting the correct answer in a test task (1 point/task).

GUIDELINES FOR PREPARING FOR THE CREDIT/EXAM

ANSWER REQUIREMENTS AND GRADING CRITERIA:

Excellent (5/A - 45–50 points on the credit/exam): Awarded for a correct, complete, and logically structured answer; the ability to use specialized terminology effectively; the ability to illustrate theoretical points with practical examples.

Good (4/B - 35–44 points on the exam): Awarded for a correct, complete, and logically structured answer with minor errors or inaccuracies; the ability to use specialized terminology, but with conclusions or generalizations that are not entirely comprehensive.

Satisfactory (3/C - 30–34 points on the exam): Awarded for a schematic, incomplete answer; difficulty in using specialized terminology or lack of knowledge thereof; or the presence of one significant error.

Fail (2/F - <30 points on the exam): Awarded if the answer to all ticket questions contains significant errors; an inability to use specialized terminology; an inability to provide examples of the practical application of scientific knowledge.

Admission to the course exam is granted with a total of more than 30 points.

During the semester, a student can accumulate between 30 and 50 points.

The minimum score for the exam answer is 30, the maximum is 50.

11. EDUCATIONAL AND METHODOLOGICAL RECOMMENDATIONS FOR TEACHERS

ORGANIZATION OF PRACTICAL TRAINING

During practical classes, students' assimilation of lecture material is monitored, and they engage in patient management and practical skills assessment.

Visual aids, simulators, equipment trainers, or demonstrations of procedures in real clinical settings are used to demonstrate and practice practical skills. To evaluate clinical reasoning abilities, students are assigned case-based scenarios, clinical histories, test assignments, clinical case analyses of real patients, and attend medical conferences, consultations, and scientific symposia.

Active and interactive teaching methods are widely used in the educational process (small group work, stimulating creative activity, utilizing computer-based learning programs, conference-style sessions).

The instructor oversees students' independent work, preparation of essays, student research activities, patient work under supervision, interpretation of ancillary test results, and completion of medical documentation.

Work with academic literature is considered a form of academic activity and is completed within the hours allocated for its study. Every student is provided with access to the electronic library resources of the institute and the department.

Student training fosters the development of communication skills with patients, adhering to the principles of ethics and medical deontology.

Independent work promotes the development of patient interaction skills, literature analysis skills, analytical thinking, documentation proficiency, accuracy, and discipline.

Students' baseline knowledge is assessed through testing. Ongoing monitoring of subject mastery is conducted through oral questioning during classes, clinical case discussions, and through solving standard situational tasks and test assignments.

Upon completion of the course, mid-term and final knowledge assessments are conducted using tests, practical skills evaluations, and situational task solutions.

Grading Criteria for Assessments

1. Tests: Graded on a scale of 1 point per correct answer. Failure to attempt the test results in a deduction of 1 point.

2. Open-Ended Response Assignments: Graded as follows: complete answer - 2 points; incomplete answer - 1 point; no answer - 0 points; failure to attempt the assignment results in a deduction of 2 points.

3. Homework: Must be completed by all students for admission to the final assessment. Late submission incurs a deduction of 1 point from the final grade.

4. Credit/Exam Grading Criteria: (To be specified separately, typically referencing the scale provided in Section 10).

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