

Current issues of neurosurgery	
General information	
Education program (industry, specialty, level of higher education, form of education)	Example: 22 Healthcare, 221 Medicine, second (master's) level of higher education, full-time
Academic year	2020
Name of discipline, code (e-mail address on the website of LNMU named after Danylo Halytsky)	Current issues of neurosurgery
Department (name, address, phone, e-mail)	Neuropathology and Neurosurgery
Head of the department (contact e-mail)	Prof., Ph.D. Anzhelika Paenok
Year of study (the year in which the study is implemented disciplines)	6th year medical faculty
Semester (semester in which the study of the discipline is implemented)	11-12 semester medical faculty
Type of course / module (compulsory / optional)	Elective course (elective course)
Teachers (names, surnames, degrees and titles teachers who teach the discipline, contact e-mail)	Prof., Andriy Netlyukh Assistant, Candidate of Medical Sciences Mr. Oleg Kobyletsky assistant. Dmitry Shchibovik assistant. Andriy Kulyk kaf_neuropathology_fpge@meduniv.lviv.ua
Erasmus yes / no (availability of the discipline for students within the Erasmus + program)	No
The person responsible for the syllabus (the person to whom it should be provided comments about syllabus, contact e-mail)	assistant. Andriy Kulyk
Number of ECTS credits	4.0
Number of hours (lectures / practical classes / individual work)	Total hours: 120 Lectures: 0 Practical: 30 Individual work: 90

Language	Ukrainian, English
Information about consultations	Consultations are conducted by all teachers according to the schedule approved at the meeting of the department and posted on the website
Address, telephone and rules of operation of the clinical base, office) (if necessary)	"Clinical Hospital of Ambulance" 79059, Lviv, street I. Mykolaychuk, 9 Tel / fax 252-75-90, reception 258-70-11
	emergencyhospital_uoz_lviv@ukr.net

Short annotation to the course

The program of the elective course "Topical issues of neurosurgery" is designed for training specialists of the second (master's) level of higher education in the field of knowledge 22 "Healthcare", specialty 222 "Medicine" for students of the VI course of the medical faculty.

The course includes 30 hours of practical classes, 90 hours of independent work.

The course "Topical issues of neurosurgery" deepens knowledge of neurosurgery - applied and basic medical science, practical field of medicine, which is surgery of diseases and lesions of the central and peripheral nervous system of various genesis, vascular pathology brain and spinal cord, surgery on the leading pathways and centers of the CNS (central nervous system) and ANS (autonomic nervous system), surgery for pain and consequences of lesions of the CNS and PNS (central and peripheral nervous system) are different genesis. A deeper study of the basics of the clinical course of neurosurgical diseases, modern methods of diagnosis and treatment of neurosurgical patients, the ability to provide emergency care will allow future doctors (especially future neurologists, traumatologists, psychiatrists, ophthalmologists, otorhinolaryngologists, general surgeons, obstetricians and gynecologists) to gain some experience and practical skills on the features neurosurgical pathology and tactics of neurosurgical patients.

The purpose and objectives of the course

1. The purpose of the course is to provide an expanded knowledge base, necessary skills and experience, as well formation of professional prudence and independence in the training of qualified a doctor who knows the general principles of diagnosis and treatment of the main types neurosurgical pathology, is able to provide first aid for this pathology, conducts active educational work on the prevention of neurosurgical diseases.
2. The main task of teaching the discipline is to give future doctors theoretical knowledge, skills and practical skills in neurosurgery that may be used by them in the future practice. In previous courses students according to the program have mastered the basics of pathogenesis, clinic, diagnosis and treatment of the most common diseases of the nervous system. Neurosurgery program in the 6th year includes information about the modern approach to diagnosis, examination, clinics of patients with combined craniocerebral and

spinal cord injury, and also trauma to peripheral nerves. The program includes the study of the current state knowledge of vascular pathology of the nervous system in the neurosurgical aspect, neurooncology, basics of functional and restorative neurosurgery, etc.

3. Competences and learning outcomes, the formation of which provides the study disciplines (general and special competencies):

General:

- ability to act socially responsibly and consciously;
- ability to apply knowledge in practical situations;
- ability to abstract thinking, analysis and synthesis;
- ability to communicate in the native language orally and in writing;
- ability to communicate with representatives of other specialties;
- knowledge and understanding of the subject area and understanding of professional activity;
- ability to search, process and analyze information from various sources.

Special:

- ability to collect medical information about the patient and analyze clinical data;
- ability to interpret the result of laboratory and instrumental research;
- ability to diagnose: determine the preliminary, clinical, final, concomitant diagnosis, emergencies;
- ability to determine the tactics of examination and management of the patient with different neurosurgical diseases;
- ability to interpret the results of laboratory and instrumental methods research;
- ability to formulate general tactics of treatment;
- demonstrate the ability to keep medical records of patients with neurosurgical pathology;
- demonstrate mastery of the principles of clinical deontology.

4. Prerequisites of the course

Mastering the course "Topical issues of neurosurgery" is based on in-depth study students of morphological disciplines - human anatomy; histology, cytology and embryology; physiology, pathomorphology; pathophysiology; clinical disciplines - general surgery (with operative surgery and topographic anatomy), propaedeutics of internal medicine, propaedeutics of pediatrics, neurology, psychiatry, ophthalmology, otorhinolaryngology, traumatology and orthopedics, oncology, radiology, anesthesiology, and intensive care, pharmacology, neurosurgery and integrates with these disciplines.

5. Program learning outcomes

List of learning outcomes		
Learning outcome code	The content of the learning outcome	Reference to the code of the competence matrix
The code will be generated when filling the syllabus	<i>Learning outcomes determine that the student after completing the discipline must know, understand and be able to perform.</i>	Symbol of the code of the program learning outcome

<p>Kn knowledge P practical skills C competence AR autonomy and responsibility</p>	<p><i>Learning outcomes follow from the set learning goals.</i> <i>To enroll in the discipline, it is necessary to confirm the achievement of each learning outcome.</i></p>	<p>in the standard of higher education.</p>
<p>Kn-1 Kn-2 Kn-3 Kn-4 Kn-5 Kn-6 Kn-7</p>	<p>to create a modern idea of the basic states of neurosurgical pathology of the brain and spinal cord to form the understanding of the types and severity of traumatic brain injury knowledge of the types and severity of spinal cord injuries and peripheral nerve injuries know modern information about vascular diseases of the brain and spinal cord have knowledge of the basics of diagnosis and treatment of tumors of the nervous system to set out the basic principles of diagnosis and treatment of degenerative diseases of the spine know the modern basics of emergency neurosurgical care</p>	
<p>Kn-1 Kn-2 Kn-3 Kn-4 Kn-5</p>	<p>to conduct neurological examination of the patient; to substantiate the diagnosis; to carry out differential diagnostics; to make the detailed plan of treatment and rehabilitation of the concrete patient (taking into account neurologic symptomatology, age, concomitant diseases); be able to provide emergency care.</p>	
	<p>to carry out professional activity in social interaction based on humanistic and ethical principles; identify, set and solve problems; to adapt to new clinical situations.</p>	
	<p>demonstrate the ability to independently search, analyze and process medical information; adhere to the principles of deontology and professional ethics in practical work; have the ability to act socially responsibly and consciously in standard and non-standard clinical situations.</p>	

6. Format and scope of the course		
	Number of hours	Number of groups
Lectures	0	
Practical classes	30	
seminars	0	
individual work	90	

7. Topics and content of the course				
Code type for the class	Topic	Content	Code of the result	Professor
	Closed traumatic brain injury (TBI)	<p>Classification. Clinic, diagnosis and treatment of concussion and compression of the brain. Granting first aid for patients with trauma at the scene and on prehospital stage. Modern diagnostic methods, assessment of their informativeness. Indications for surgery treatment for trauma in acute and remote periods. Methods of skull trepanation, principles of operations on the brain. Stopping methods bleeding from the soft tissues of the head, dura mater, cerebral vessels fabrics. Early and late complications with closed trauma. Conservative treatment.</p> <p>Traumatic brain injury in the remote period of the disease. Rehabilitation and readaptation of patients.</p>		According to the schedule
	Open traumatic brain injury	<p>Classification, clinic, diagnostics. Combined and combined trauma, features of clinic and diagnostics. Principles of providing emergency care to patients with open, combined and combined TBI at different stages of evacuation. The use of modern research methods in the diagnosis of IHD.</p>		

		<p>Primary surgical treatment of open penetrating and non-penetrating wounds skull and brain. Early and late complications at open TBI, principles surgical treatment. Modern methods of plastics of skull bone defects.</p> <p>Features of TBI depending on age and somatic condition of patients. Maternity trauma, emergency care, principles of treatment and prevention.</p>		
	<p>Spinal spinal cord trauma. Traumatic injuries peripheral nerves</p>	<p>Etiopathogenesis of traumatic lesions of the spine and spinal cord. Classification.</p> <p>Clinic of various types of spinal cord and spine injuries depending on the level damage. Modern methods of clinical and instrumental diagnosis. Rating detected changes in the use of auxiliary methods for diagnosing traumatic injuries spinal cord and spine.</p> <p>Emergency care for patients with traumatic injuries spine and spinal cord, basic methods and principles transport immobilization patients depending on the level of damage. Indications to surgical treatment at spinal cord injury. Modern methods of treatment spinal cord and spine injuries.</p>		
	<p>Brain tumors.</p>	<p>Classification. Clinic. Diagnosis. Cerebral and focal symptoms of brain tumors. Pathogenesis primary and secondary symptoms in brain tumors.</p> <p>Pathophysiological mechanisms of hypertension syndrome formation in brain tumors.</p> <p>Application of modern auxiliary examinations (ophthalmological examination, craniography, ultrasound, EchoEG, EEG,</p>		

		<p>pneumoencephalography, angiography, computed tomography, MRI, SPECT) in the diagnosis of brain tumors. Modern methods surgical treatment of brain tumors depending on the histological structure and localization.</p> <p>Radical and palliative operations, their principles.</p> <p>Combined and radiosurgical treatment of brain tumors.</p> <p>Emergency care for acute syndrome intracranial hypertension and dislocation syndromes.</p> <p>Rehabilitation and readaptation of patients after surgery intervention for brain tumors.</p> <p>The importance of bad habits in the development of extensive brain damage.</p>		
	<p>Hydrocephalus. Malformations of the CNS.</p>	<p>Pathogenesis. Clinic. Diagnosis. Classification. Modern methods and principles of surgical treatment of hydrocephalus. The main types cerebrospinal fluid bypass operations, indications for their implementation and methods of conducting.</p> <p>Emergency care for shunt dysfunction. Rehabilitation and social readaptation of patients. The most common defects development of the CNS in need of neurosurgical care. Early diagnosis of CNS malformations. Promoting a healthy lifestyle as a method prevention of CNS defects. Craniostenosis. Clinic, diagnostics, modern methods of neurosurgical treatment.</p> <p>Craniocerebral and spinal hernias. Clinic, diagnosis, indications to surgical treatment. Modern principles of treatment of cranial</p>		

		and spinal hernias		
	Purulent-inflammatory processes of the brain	<p>Purulent-inflammatory processes brain. Etiology brain abscesses. Clinic of brain abscesses of different localization. Diagnosis of brain abscesses.</p> <p>The value of auxiliary examination methods in the diagnosis of this pathology.</p> <p>Principles of surgical treatment of brain abscesses.</p> <p>Prevention of brain abscesses.</p> <p>Specific inflammatory processes of the brain. Etiology, clinic, diagnosis, treatment methods.</p> <p>Prevention of tuberculosis, AIDS, syphilis.</p>		
	Vascular disease brain, accompanied by disorders blood circulation for hemorrhagic type	<p>Classification. Clinic.</p> <p>Etiopathogenesis. Methods diagnosis of vascular pathology brain. Vascular diseases of the brain that require surgical treatment.</p> <p>Clinic, diagnosis and treatment of aneurysms, arteriovenous malformations, carotid-cavernous joints in acute and distant periods.</p> <p>Emergency care for patients with acute disorders cerebral circulation for hemorrhagic type.</p> <p>Modern methods of surgical treatment of patients with vascular pathology of the brain.</p> <p>Rehabilitation treatment in postoperative period. Prevention of vascular diseases of the brain</p>		
	Vascular diseases of the brain and spinal cord, accompanied by disorders blood circulation by ischemic type	<p>Types of pathology of the main vessels, manifested by acute and chronic cerebral ischemia.</p> <p>Classification. Etiopathogenesis.</p> <p>Value arterial hypertension and other diseases in development atherosclerosis of blood vessels, as the main risk factor development of cerebrovascular disorders of the</p>		

		<p>ischemic type. Clinic, diagnosis and treatment of stenoses, thrombosis and thromboembolism of cerebral vessels.</p> <p>Emergency care for patients with acute disorders cerebral circulation by ischemic type.</p> <p>Modern methods of surgical treatment of ischemic brain lesions. Rehabilitation treatment in postoperative period. Prevention of vascular diseases of the brain. Rehabilitation and readaptation of patients with cerebrovascular pathology</p>		
	<p>Pathology of the vessels of the spinal cord</p>	<p>The main clinical manifestations of vascular pathology of the spinal cord. Etiology and pathogenesis of acute syndrome myeloradiculosis, AVM of the vessels of the spinal cord. Diagnosis. Emergency care for patients with acute disorders spinal circulation by ischemic type.</p> <p>Methods of surgical treatment of vascular pathology of the spinal cord. Rehabilitation treatment in postoperative period. Rehabilitation and readaptation of patients with vascular pathology of the spinal cord.</p>		
	<p>Tumors of the spine and spinal cord</p>	<p>Classification. Features of the clinic depending on the location of the tumor and the nature of its growth. Modern methods of diagnosing spinal cord tumors.</p> <p>The value of auxiliary methods in the examination of patients with spinal cord tumors and the differential diagnosis of this pathology. Methods of surgical treatment of spinal cord tumors. Laminectomy technique. Prevention of complications in</p>		

		spinal cord tumors (urosepsis, sepsis, bedsores)		
	Degenerative diseases of the spine and spinal cord	Classification of degenerative-dystrophic diseases of the spine and intervertebral discs. Pathogenesis. Clinic. Diagnosis. Emergency care for radicular pain syndrome. Indications for surgical treatment of degenerative-dystrophic diseases of the spine and intervertebral discs and its principles depending on the level and degree of damage. Modern methods of treatment of degenerative-dystrophic diseases of the spine and intervertebral discs. Rehabilitation treatment in postoperative period, rehabilitation of patients. Prevention of degenerative-dystrophic diseases of the spine		
	Purulent-inflammatory processes of the spinal cord. Epiduritis	Purulent-inflammatory processes spinal cord. Epiduritis. Etiology of spinal abscesses brain and epiduritis. Clinic of spinal cord abscesses of different localization. Diagnosis spinal cord abscesses and epiduritis. The value of auxiliary survey methods in diagnosis of this pathology. Principles of surgical treatment of spinal cord abscesses and epiduritis. Prevention of spinal cord abscesses and epiduritis. Specific inflammatory processes of the spine and spinal cord. Clinic, diagnosis and prevention. Rehabilitation and social readaptation of patients with purulent-inflammatory processes of the spinal cord brain and spine		
	Functional neurosurgery.	Principles of stereotactic operations. Indications for their use in diseases of the brain. Modern principles and indications to surgical		

		<p>treatment of epilepsy, parkinsonism, pediatrics cerebral palsy, etc. Modern principles stereotactic interventions. Radiosurgery as one of the types of stereotactic non-invasive interventions in neurosurgery. Basic indications and principles of radiosurgical interventions. Methods of treating spasticity. The main types of destructive and stimulatory interventions in the treatment of spasticity. The concept of intrathecal pharmacotherapy. Development prospects functional neurosurgery.</p>		
	<p>Restorative neurosurgery. Neurotransplantation</p>	<p>Reconstructive neurosurgery as one of the modern directions neurosurgery. Basic principles of restorative neurosurgery. Types of surgical interventions used in reconstructive neurosurgery and indications for their use. Neurotransplantation as the latest method of restorative neurosurgery. Basic principles and methods of neurotransplantation. Impressions to use neurotransplantation in the treatment of degenerative-dystrophic lesions of the CNS.</p>		
	<p>Surgical treatment of pain syndromes.</p>	<p>The concept of relentless pain. Mechanisms formation of the main pain syndromes. Classification. Clinic. Modern principles and methods of diagnosis. Differential diagnosis. Emergency care for neuralgia, causalgia, phantom and amputation pain syndromes. Show to surgical treatment of pain syndromes and its modern principles. Modern methods of surgical</p>		

		treatment of intractable pain syndromes. Rehabilitation and social readaptation of patients with uncontrollable pain syndromes		
1	Preparation for practical classes – theoretical preparation and processing practical skills	Independent outside classroom work of students precedes preparation for practical classes and includes independent processing of material for with the help of methodical instructions, additional sources of literature of printed writing abstract in the form of an abstract, followed by his oral defense in preparation for the final test		
2	Writing essays on the relevant topics of practical classes from the list recommended topics	Independent outside classroom work of students precedes preparation for practical classes and includes independent processing of material for with the help of methodical instructions, additional sources of literature of printed writing abstract in the form of an abstract, followed by his oral defense in preparation for the final test		
3	Preparation of literature review and extended report on the topic of practical classes	Independent outside classroom work of students precedes preparation for practical classes and includes independent processing of material for with the help of methodical instructions, additional sources of literature of printed writing abstract in the form of an abstract, followed by his oral defense in preparation for the final test lesson		

In the process of studying the discipline "Topical issues of neurosurgery" the following teaching methods are used:

- by type of cognitive activity: explanatory-illustrative, analytical, synthetic, reproductive, research;
- by sources of knowledge: verbal - story, conversation, visual - demonstration, illustration;
- system approach: stimulation and motivation, control and self-control.

In the process of studying the discipline "Actual issues of neurosurgery" modern methods of

presenting material in the form of presentations, summary tables, modeling are used. clinical situations.

8. Verification of learning outcomes

Current control is carried out during the training sessions and aims to check the assimilation of students' educational material (it is necessary to describe the forms of current control during the training sessions). Forms of assessment of current educational activities should be standardized and include control of theoretical and practical training. The final grade for the current educational activity is set on a 4-point (national) scale

Code of the result	Learning outcome code	Method of verifying learning outcomes	Enrollment criteria
		<ul style="list-style-type: none"> - individual - survey according to - theoretical issues that are set out in the guidelines for - preparing for - practical training; - test questions based on recommended literature sources; - written clinical and situational tasks. 	<p>The student has mastered the theoretical material can describe the etiology, pathogenesis and clinical features basic nosological forms, variants of their clinical current.</p> <p>Can spend differential diagnostics disease in a particular clinical situation and establish preliminary diagnosis.</p> <p>Makes a detailed examination plan and clinical route of the patient with neurosurgical pathology.</p> <p>Makes up preliminary treatment and rehabilitation plan the patient.</p> <p>Can assess risks and dates approximate forecast in specific</p>

			clinical situation. Provides emergency neurosurgical care at both pre-hospital and hospital stages. Responds in detail and fully to oral and written issues, solves clinical and situational tasks.
		<ul style="list-style-type: none"> - registration of independent work on topics in the form of an abstract; - protection of independent work in the form - answers to oral questions on the topic of independent work. 	The student searched for literature, worked in sufficient literary sources. With reference to the authors issued an abstract on the topic of independent work. The student is clear and understandable responds to theoretical questions on the topic of the written work, conducts differential diagnostics and shows the skills of logic clinical thinking.
Final control			
General evaluation system	Participation in the work during the semester on a 200-point scale		
Rating scales	traditional 4-point scale, multi-point (200-point) scale, ECTS rating scale		
Conditions of admission to the final control	The student attended all practical (laboratory, seminar) classes and received at least 120 points for current performance		
Type of final control	Methods of final control	Enrollment criteria	

Test	All topics submitted for current control must be included. Scores on a 4-point scale are converted to points for multi-point (200-point) scale in accordance with the Regulation "Criteria, rules and procedures for evaluation results of students' educational activities " The maximum number of points is 200. The minimum number of points is 120	
<p>The maximum number of points that a student can score for the current academic activity for admission to the exam (differentiated test) is 120 points.</p> <p>The minimum number of points that a student must score for the current academic activity for admission to the exam (differentiated test) is 72 points.</p> <p>The calculation of the number of points is based on the grades obtained by the student on a 4-point (national) scale during the study of the discipline, by calculating the arithmetic mean (CA), rounded to two decimal places. The value obtained is converted into points on a multi-point scale as follows: $x = (CA \times 120) / 5$.</p>		
10. Literature		
<p>Required:</p> <ol style="list-style-type: none"> 1. Baehring JM, Piepmeier JM, editors. Brain Tumors: Practical Guide to Diagnosis and Treatment.. CRC Press; 2019. 557 p. 2. Bajsarowicz P, Prakash I, Lamoureux J et al. Nonsurgical acute traumatic subdural hematoma: what is the risk? J Neurosurg 2015;123(5):1176-83. 3. Joaquim AF, Ghizoni E, Tedeschi H, Ferreira MAT, editors. Fundamentals of Neurosurgery. A Guide for Clinicians and Medical Students. Springer International Publishing; 2019. 302 p. 4. Long IL Diseases of the peripheral nervous system: a textbook for practicing physicians, for medical students: in 3 volumes / IL Long; for order. NK Sviridova. - Kyiv: Bila Tserkva. books. f-ka; 2016;3:464 p. 5. Methods of examination of a neurological patient: a textbook / L.I. Sokolova, TM Cherenko, TI Ilyash and others. 2nd edition. К .: ВСВ «Медицина», 2020. 144 с. 6. Neurology: nat. textbook / [Grigorova IA, Sokolova LI, Gerasimchuk RD etc.]; ed. I.A. Grigorova, LI Sokolova. - К .: ВСВ «Медицина», 2020. - 640 с. 7. Neurosurgery: a textbook / V.O. Pyatikop, I.O. Angular, A.V. Kozachenko and others; for order. V.O. Pentagon. - К .: ВСВ «Медицина», 2019. - 152 с. 8. Nikkhah G, Pinsker M, editors. Stereotactic and Functional Neurosurgery. Springer-Verlag Wien; 2013. 112 p. 9. Norusi AA, Shokouhi JJ. Neuro-Oncology. Berlin: Urban & SINA; 2020.268 p. 10. Norusi AA, Shokouhi JJ. Vascular Disease of CNS. First Edition. Berlin: Urban & SINA; 2020.164 p. 		

11. Norusi AA, Shokouhi JJ. Vascular Neurology Board Review: An Essential Study Guide. 1-st ed. Springer; 2017. 200 p.
12. Passier PE, Visser-Meily JM, Rinkel GJ et al. Determinants of health-related quality of life after aneurysmal subarachnoid hemorrhage: a systematic review. Qual Life Res. 2013;22(5):1027-43.
13. Piatyko VO, Piatyko IB, Sergiienko YuH, Zavgorodnya NI, Kaliuzhka VYu. Neurosurgery: study guide. K.: Медицина; 2021. 112 с.
14. Pouratian N, Sheth S, editors. Stereotactic and Functional Neurosurgery. Springer International Publishing; 2020. 563 p.
15. Shevaga VM, Netlyukh AM, Paenok AV, Zadorozhna BV. Neurosurgery: a textbook. - 2nd edition. Lviv: PE "Quart"; 2016. 206 p.
16. Sokolova L, Panteleienko L, editors. Neurology: Clinical Cases: study guide. K.: Медицина; 2016. 96 с.
17. Tolias CM, Giamouriadis A, Hogg F, Ghimire P. Neurosurgery: A Case-Based Approach. Springer International Publishing; 2019. 218 p.
18. Torbey MT, editor. Neurocritical Care. 2nd Edition. Cambridge University Press; 2019. 466 p.
19. Tracy B, Nishikawa R, Tarbell N, Weller M, editors. Oxford Textbook of Neuro-Oncology, OUP Oxford; 2017. 264 p.
20. Vovkanich AS. Instructional materials for the care of patients with spinal cord injury. Lviv; 1995. 36 p.
21. Wang A, Schmidt MH. Neuroendovascular Surgery for the Treatment of Ischemic Stroke. Cardiology in Review. 2017;25(6):1. Available from: <https://www.researchgate.net/publication/318871138> [accessed Jun 23 2018]. DOI: 10.1097/CRD.000000000000155
22. WHO classification of CNS tumors. Access mode: <https://radiopaedia.org/articles/whoclassification-of-cns-tumours-1>.
23. Yang Y, Zheng F, Xu X et al. Levetiracetam Versus Phenytoin for Seizure Prophylaxis Following Traumatic Brain Injury: A Systematic Review and Meta-Analysis. CNS Drugs 2016;30(8):677-88.

11. Equipment, material and technical and software of the discipline / course

Schemes, tables, models, multimedia presentations, multimedia projector, platform Misa

Assistant. Andriy Kulyk

(Signature)

Head of Department Professor
Anzhelika Paenok
Ph.D. Md.

(Signature)