

**National Pirogov Memorial Medical University, Vinnytsya**

"Approve"

Acting rector of higher education institution


 Viktoriia PETRUSHENKO

31. 08. 2023

" AGREED

Head of the Department of  
Pathomorphology

assoc.profs. HEI Artur BEREZOVSKY

 " 28 " 09 2023

**SYLLABUS  
of academic discipline  
«PATHOMORPHOLOGY»**

Speciality	222 "Medicine"
Educational level	the second (master`s) level
Educational programme	EPP Medicine, 2022
Academic year	2023-2024
Department	Pathological Anatomy
Lecturer	ass. prof. Artur BEREZOVSKY, ass. prof. Halyna DATSENKO
Contact Information	patanatomy@vnmue.edu.ua Pirogova street, 56 (morphological building), (0432) 553938
Redactor of syllabus	ass. prof. Halyna DATSENKO

### Status and structure of the discipline:

Discipline status	Compulsory
Discipline code in EPP/discipline place in EPP	RC 21, discipline of general training
Course (s) / Semester (s)	3rd course (V and VI semesters)
The amount of discipline (the total number of hours / number of credits ECTS)	210 hours / 7,0 credits ECTS
The structure of the discipline	Lectures - 34 hours Practical classes - 62 hours Individual student work - 114 hours Total : practical classes – 47,6%, individual student work – 52,4%.
Number of content modules	6
Language of teaching	English
Form of study	Full-time ( <i>or remote full-time by order</i> )

## 2. Description of the discipline

### Short annotation of the course, relevance.

The main direction of the discipline "Pathomorphology" at the medical university is the study of morphological bases of general and special pathology of human diseases, their morphogenesis, pathogenesis, pathokinesis, thanatogenesis, as well as participation in lifelong diagnosis of diseases by biopsy.

**Prerequisite.** In the study of Pathomorphology, the so-called horizontal integration is used, the essence of which is that the main element is the objects of future medical activity. The whole human body, its organs and systems in the state of norm and pathology is the object around which the disciplines are united in the module for the purpose of interdisciplinary integration. Pathomorphology is a fundamental clinical discipline, the study of which in accordance with the requirements of the Bologna system, takes place in the third year, so it requires knowledge and skills of students from previous theoretical disciplines: Normal Anatomy, Histology, Normal Physiology, Biochemistry, Microbiology. This list of disciplines provides interrelated disclosure of anatomical, histological structure, physiological functions, biochemical processes, possible pathologies, their pathomorphological manifestations, etc. Therefore, there is a prior interdisciplinary connection, and at the time of studying pathomorphology, students must have basic knowledge and skills regarding the diagnosis and differentiation of the norm in different organs and systems.

**The course goal and its significance for professional practice.** The goal of teaching the discipline "Pathomorphology" is to study the macro-microscopic and molecular-ultrastructural changes of the human body in the development of various diseases; the study of typical general pathological processes, the set of which determines the morphological manifestations of diseases; study of the structural basis of the development of diseases and their clinical manifestations, the structural basis of recovery, complications and consequences; study of methods of pathomorphological research: autopsy, biopsy, research of biopsy material, experimental modeling of diseases.

**Postrequisite.** General pathomorphology lays the understanding of the structural foundations of cell-organ pathology - general pathological processes, the combination of which causes various morphofunctional manifestations in somatic and infectious diseases. Special (clinical)

pathomorphology is the study of clinical and morphological, pathogenetic, structural and functional changes in organs and tissues, as well as modern methods of biopsy, ultrastructural and immuno-histochemical diagnosis. Thus, the knowledge gained by students during the study of pathomorphology will be used in the future in the study of other clinical disciplines, therapeutic and surgical profile, obstetrics and gynecology, ophthalmology, otolaryngology, pediatrics, forensics and others.

### **3. Learning outcomes. After successful study of the discipline the will:**

#### **know:**

- a) the basics of cell pathology and general pathological processes, the combination of which determines the morphological manifestations of certain diseases;
- b) morphology of diseases at different stages of their development (morphogenesis), structural bases of recovery, complications and consequences of diseases;
- d) variants of pathomorphosis of diseases arising in connection with changing human living conditions and as a result of various therapeutic measures (pathology of therapy);
- e) organization of pathological service and its purpose.

#### **have the skills:**

- a) to analyze the structural and functional relationships and the sequence of stages of general pathological processes.
- b) interpret the pathology of the cell and substantiate the clinical and morphological characteristics of general pathological processes that cause the manifestations of diseases.
- c) to interpret the etiology, pathogenesis and morphological changes at different stages of disease development, structural updates of recovery, complications and consequences of diseases.
- d) to compare morphological and clinical manifestations of diseases at all stages of their development allows students to acquire skills of clinical and anatomical analysis, synthetic generalization of diagnostic signs of diseases and their correct interpretation in causal relationships.

### **4. Content and logistic of the discipline:**

<b>V semester 3 content modules</b>	<b>105 hours / 3,5 credits ECTS</b>	Lectures № 1-8 Practical classes № 1-16 Topics for individual work № 1-7
<b>VI semester 3 content modules</b>	<b>105 hours /3,5 credits ECTS</b>	Lectures № 9-17 Practical classes № 17-33 Topics for individual work №8-13

The discipline includes 25 topics.

#### **Content module №1**

Topic 1. Subject and tasks of pathomorphology. Methods of pathomorphological investigations. The main stages of pathomorphology development. Injury and death of cells and tissues. Necrosis and apoptosis. Death, definition, signs of death. Autopsy.

Topic 2. Morphology of reversible and irreversible damage of cells and tissues. Intracellular accumulation of proteins, carbohydrates and lipids.

Topic 3. Extracellular accumulation of proteins, carbohydrates and lipids.

Topic 4. Pathology of pigments (mixed degenerations). Morphology of mineral metabolism disturbance.

Topic 5. Disturbance of blood and lymph circulation (hyperemia, ischemia, haemorrhage, stasis). Thrombosis, embolism, infarct, disseminated intravascular coagulation. Computer MCQs-control for the concluding session №1.

#### **Content module №2**

Topic 6. General studies on inflammation. Exudative inflammation. Morphology of exudative inflammation. Proliferative inflammation. Specific inflammation (tuberculosis, syphilis, leprosy, rhinoscleroma). Granulomatosis.

Topic 7. Pathomorphology of the immune system. Reactions and mechanisms of hypersensitivity. Autoimmune diseases. Immunodeficiency states. Amyloidosis. Compensatory and adaptive processes (regeneration, hypertrophy, hyperplasia). Atrophy, metaplasia, reconstruction of tissues, organization. Computer MCQs-control for the concluding session №2.

### **Content module №3**

Topic 8. General studies on tumours. Epithelial tumours without specific localization.

Topic 9. Nomenclature and morphological features of tumors of the epithelium with specific localization.

Topic 10. Nomenclature and morphological features of tumours originated from epithelium (organospecific epithelial tumours).

Topic 11. Nomenclature and morphological features of the nervous tissue. Peculiarities of the central nervous system tumours. Nomenclature and morphological features of tumours originated from melanin-producing tissue. Peculiarities of the tumour growth in childhood. Dysontogenetic tumours. Teratomas and teratoblastomas.

Topic 12. Leukemia. Lymphomas. Anemia. Thrombocytopenia and thrombocytopathy. Coagulopathy.

### **Content module №4**

Topic 13. Arteriosclerosis. Atherosclerosis. Coronary heart disease. Hypertension and hypertension. Cerebrovascular disease. Arteriosclerosis.

Topic 14. Systemic connective tissue diseases.

Topic 15. Acute and chronic diseases of the respiratory system.

### **Content module №5**

Topic 16. Diseases of kidneys.

Topic 17. Diseases of alimentary system.

Topic 18. Diseases of the liver.

Topic 19. Endocrine pathology.

Topic 20. Diseases of the reproductive system, pregnancy.

Topic 21. Diseases of the pregnancy, perinatal pathology.

### **Content module №6**

Topic 22. Primary, hematogenous and secondary tuberculosis.

Topic 23. Viral infections. AIDS. Rabies. Rickettsioses.

Topic 24. Intestinal infectious diseases. Sepsis.

Topic 25. Diphtheria. Scarlet fever. Meningococcal infection.

## **5. Forms and methods of monitoring academic performance:**

The current control in practical lessons	Methods: oral or written examination, testing, computer examination, solving situational problems, their interpretation and evaluation of their results (registration of the protocol in the workbook)
Control of mastering the thematic section of the discipline at intermediate control classes	Methods: oral or written examination, computer testing, solving situational problems, control of practical skills
Final semester control (credit)	According to the regulations on the organization of the educational process in National Pirogov Memorial Medical University, Vinnytsia (link <a href="https://www.vnmu.edu.ua/General">https://www.vnmu.edu.ua/General</a> information)
Final control of the discipline - exam	Methods: pre-examination testing, oral examination (according to the regulations on the organization of the educational process in National Pirogov Memorial Medical University, Vinnytsia (link <a href="https://www.vnmu.edu.ua/General">https://www.vnmu.edu.ua/General</a> information)
Tools for diagnosing learning success	Theoretical questions, tests, clinically-oriented situational tasks, practical tasks, demonstration of practical skills

## 6. Assessment of student performance:

Assessment of student performance is carried out in accordance with the Regulations on the organization of the educational process in National Pirogov Memorial Medical University, Vinnytsia (link link <https://www.vnmu.edu.ua/General> information)

Current control	According to the traditional four-point system: 5 «excellent», 4 «good», 3 «satisfactory», 2 «not satisfactory»
Intermediate section controls	According to the traditional four-point system.
Control of practical skills	According to the traditional four-point system.
Semester credit	According to the 200-point scale (arithmetic mean for the semester is converted into points) Credited: from 120 to 200 points Not credited: less than 120 points (see Grading scale)
Final control	Sum of points for pre-examination testing (12-20 points) and oral examination (38-60 points) Exam grade: 71-80 points - "excellent" 61-70 points - "good" 50-60 points - "satisfactory" Less than 50 points - "unsatisfactory" / did not pass
Discipline assessment	Current performance - from 72 to 120 points (conversion of the average traditional grade for practical classes on a 120-point scale): 60% of the grade for the discipline Final control - from 50 to 80 points: 40% of the grade for the discipline Individual work - from 1 to 12 points A total of 122 to 200 points.

### Discipline Score Scale: National and ECTS

Total points for all the educational activities	ECTS assesment	Score on a national scale	
		for exam, course project (work), practice	for credit
180-200	A	excellent	credited
170-179,99	B	good	
160-169,99	C		
141-159,99	D	satisfactory	
122-140,99	E	satisfactory	-
0-121,99	FX	unsatisfactory with the possibility of reassembly	credited
	F	unsatisfactory with a mandatory reexamination of discipline	is not credited with the possibility of reassembling

### Criteria for assessing the mastering of theoretical knowledge and practical skills during the current, intermediate and final control. Assessment of oral / written response during the current control.

The grade "**excellent**" is given to a student who has deeply and comprehensively mastered the theoretical material, competently and logically tells it. He is fluent in Latin terminology, clearly answers non-standard questions on the topic of the lesson, is able to link the material of the topic with previously studied sections, which indicates mastery of the recommended literature and the ability to analyze the material studied, and clearly demonstrates the importance of theoretical knowledge for practice medicine.

The grade "**good**" is given to a student who knows and has good theoretical material, tells it correctly, does not allow inaccuracies in the answer, is able to reveal the topic from the standpoint

of its medical significance and practical application, but the answers do not go beyond the textbook, guidelines.

The grade "**satisfactory**" is given to a student who knows the basic concepts and definitions of the studied topic, but admits significant inaccuracies or has difficulty in formulating the answer, does not understand the medical aspects of the topic, can not relate theoretical material to practice.

The grade "unsatisfactory" is given to a student who does not know the theoretical foundations of the topic, makes gross mistakes in answering, does not understand the basic concepts and definitions, can not explain the importance of theoretical material for practical medicine.

#### **Assessment of practical skills during the current control**

A grade of "**excellent**" is given to a student who knows the course and sequence of independent teaching and research work to perform a practical task, seeks the best options for setting up a medical experiment, demonstrates the correct implementation of the necessary practical skills, and true with clear formulations of generalizations and conclusions corpse material both in the section hall and in the study of macroscopic and histological material.

A grade of "**good**" is given to a student who makes inaccuracies in the study, but is able to identify mistakes and can demonstrate the implementation of practical skills in general, accurately draws up research results in the protocol of practical training, works well with medical equipment.

Assessment of "**satisfactory**" is given to a student who knows the basics of the practical task, but has difficulty performing microscopic examination, can not demonstrate the correct sequence of practical skills, can not fully interpret the results of research, sloppily draws up a protocol of practical training.

A grade of "**unsatisfactory**" is given to a student who cannot demonstrate the performance of practical skills, experiences significant difficulties in performing the practical part of the lesson, violates the procedure of practical work, does not register the progress in the protocol for practical work.

#### **Assessment of test tasks during the current control**

A grade of "excellent" is given to a student who allows no more than 10% of incorrect answers (90-100% of correct answers) during the test examination. Provides correct answers to all test questions when solving clinically-oriented test tasks.

A grade of "good" is given to a student who makes no more than 20% of mistakes during the examination (volume of correct answers 80-89%). Provides correct answers to most test questions when solving clinical-oriented test tasks.

A grade of "satisfactory" is given to a student who makes mistakes in no more than 40% of test tasks (the amount of correct answers is 60.5-79%). When solving clinically-oriented test tasks, it provides the correct answers to only some questions to the test.

A grade of "unsatisfactory" is given to a student who correctly solves less than 60% of the test tasks in a test examination. When solving clinical-oriented test tasks, he cannot provide the correct answers to the test questions.

#### **Assessment of intermediate control (credit)**

Intermediate control is credited if the student has mastered a certain section of the discipline in full, as evidenced by the current assessment of each practical lesson, and attended a lecture course. To assess the intermediate control, the calculation of the arithmetic mean traditional grade for the semester is performed.

#### **Criteria for assessing knowledge of pathomorphology during the exam**

Students who have completed all types of work provided for in the curriculum and scored at least the minimum number of points during the study of the discipline are admitted to the exam.

The form of the exam is standardized and includes control of practical and theoretical training.

A grade of "Excellent"

It is presented to a student who has deeply and reliably mastered the program material, comprehensively, consistently, competently and logically answers 3 theoretical questions; in response to which theory is clearly linked to practice. At the same time he has no difficulty in modifying the task. Familiar with additional literature on this material, and has in-depth knowledge of issues that are submitted for self-study. Correctly describes the macro and micropreparation. When conducting practice-oriented tests allows no more than 10% of incorrect answers.

#### A grade of "Good"

It is presented to a student who firmly knows the practical material, teaches it competently, but admits some inaccuracies in answer to 3 theoretical questions, and is not deeply oriented in questions on topics for self-study. Correctly describes the macro and micropreparation. During practice-oriented tests allows no more than 20% of errors.

#### A grade of "Satisfactory"

It is presented to a student who knows only the basic material, admits inaccuracies in the answers to the main questions and has superficial knowledge in questions on topics for self-study, has difficulty describing macro and micropreparations on the topic. According to the results of practically oriented tests, it makes mistakes in no more than 40% of tests.

#### A grade of "Unsatisfactory"

It is presented to a student who does not know a significant part of the program material, makes significant mistakes in answering the main questions, and lack of knowledge on topics for self-study. Shows uncertainty and ignorance when describing macro and micropreparations. With practice-oriented tests it makes mistakes in more than 50% of test tasks.

### **7. Policy of discipline / course**

The student has the right to receive quality educational services, access to modern scientific and educational information, qualified counseling during the study of the discipline and the mastering of practical skills. The policy of the department during the provision of educational services is student-centered, based on regulations of the Ministry of Education and the Ministry of Health of Ukraine, the university charter and the procedure for providing educational services, regulated by the main provisions of the educational process at National Pirogov Memorial Medical University, Vinnytsia and the principles of academic integrity.

#### **Adherence to the rules of National Pirogov Memorial Medical University, Vinnytsia, safety techniques in practical classes.**

Instruction on safety, safety of handling chemical reagents is carried out at the first practical lesson by the teacher. The briefing is registered in the Safety Briefing Journal. A student who has not been instructed is not allowed to perform practical work.

#### **Requirements for preparation for practical classes.**

The student must be prepared for a practical lesson, test tasks for the current topic should be solved in a workbook.

Student should come to class on time, without delay. A student who is more than 10 minutes late for class is not allowed to the lesson and must work it in the prescribed manner.

In practical classes, the student must be dressed in a work uniform (medical gown, hat). Students who do not have a work uniform are not allowed to study.

The student must follow the safety rules in practical classes and during the stay in the department.

When discussing theoretical issues, students should demonstrate tolerance, courtesy and respect for their colleagues and the teacher; when performing practical tasks, the workplace should be kept in order and cleaned after the practical work.

#### **Usage of mobile phones and other electronic devices.**

The use of mobile phones and other electronic devices in the classroom is allowed only during electronic testing or surveys.

Academic integrity. During the study of the discipline the student must be guided by the Code of Academic Integrity of National Pirogov Memorial Medical University, Vinnytsia (link <https://www.vnmu.edu.ua/> General information / Basic documents / Code of Academic Integrity). In case of violation of the norms of academic integrity during the current and final controls, the student receives a grade of "2" and must work it out to his teacher in the prescribed manner within two weeks after receiving an unsatisfactory grade.

#### **Occupy passes.**

Missed classes are practiced in the manner prescribed by the Regulations on the organization of the educational process in National Pirogov Memorial Medical University, Vinnytsia (link [https://www.vnmu.edu.ua](https://www.vnmu.edu.ua/) General information / Basic documents) at the time determined by



the schedule of works (published on the website of the department <https://www.vnmdu.edu.ua/> Department of Pathological Anatomy / For students) to the teacher on duty. To complete the missed lesson, the student must provide a completed workbook protocol on the relevant topic, take a test and answer questions in writing or orally to the topic of the lesson. The practice of missed lectures is carried out after providing a synopsis of lecture material, or writing an abstract, or preparing your own presentation on the topic of missed lectures.

The procedure for admission to the final control of the discipline is given in the Regulations on the organization of the educational process in National Pirogov Memorial Medical University, Vinnytsia (link <https://www.vnmdu.edu.ua/> General information / Basic documents). Students who do not have missed unfinished practical classes and lectures and received an average traditional grade of at least "3" are admitted to the final control.

### **Additional individual points.**

Individual points in the discipline the student can get for individual work, the amount of which is published on the website of the department in the teaching materials of the discipline, the number of points is determined by the results of individual students work according to the Regulations on the organization of the educational process in National Pirogov Memorial Medical University, Vinnytsia (link <https://www.vnmdu.edu.ua/> General information / Basic documents).

### **Conflict resolution.**

In the event of misunderstandings and complaints to the teacher due to the quality of educational services, assessment of knowledge and other conflict situations, the student must first report their claims to the teacher. If the conflict issue is not resolved, the student has the right to submit an appeal to the head of the department in accordance with the Regulations on consideration of appeals of applicants for higher education at National Pirogov Memorial Medical University, Vinnytsia (link <https://www.vnmdu.edu.ua/> General information / Basic documents).

### **Politics in terms of distance learning.**

The procedure for distance learning is regulated by the Regulations on the introduction of elements of distance learning in National Pirogov Memorial Medical University, Vinnytsia ім.М.І.Пирогова (link <https://www.vnmdu.edu.ua/> General information / Basic documents). The main educational platforms for training are Microsoft Team, Google Meets. The procedure for carrying out practical classes and lectures, exercises and consultations during distance learning is published on the website of the department (<https://www.vnmdu.edu.ua/> Department of Pathological Anatomy / For students).

Feedback from the teacher is via messengers (Viber, Telegram, WhatsApp) or e-mail (at the teacher's choice) during working hours.

### **Educational resources.**

Educational and methodological support of the discipline is published on the website of the department. Route of receiving materials: [https://www.vnmdu.edu.ua](https://www.vnmdu.edu.ua/) / Department of Pathological Anatomy / For students.

### **Recommended reading:**

#### **Basic literature**

1. Klatt Edward C. Robbins and Cotran Atlas of Pathology 3rd Edition / Edward C. Klatt, MD – Canada: Elsevier - 2015 – 600p.
2. Kumar V. Robbins Basic Pathology. 10th Edition / Vinay Kumar, Abul Abbas, Jon Aster. – Canada: Elsevier – 2018. – 952p.
3. Kumar V. Robbins Basic Pathology Professional 9th Edition / Kumar V., Abbas A.K., Aster J.C. – Canada: Elsevier Health Sciences, 2015 – 1408p.



4. Diagnostic Immunohistochemistry Theranostic and Genomic Applications 5th Edition / David J. Dabbs, MD – Canada: Elsevier – 2019 – 944p.
5. Quick Reference Handbook for Surgical Pathologists Second Edition / Natasha Rekhtman, Marina K Baine, Justin A. Bishop – Switzerland: Springer – 2019 – 211p.

#### Supporting literature

1. Rubin's Pathology : Clinicopathologic Foundations of Medicine, 5th Edition. - Lippincott Williams & Wilkins, 2007. – 1844 p.
2. Robbins and Cotran Pathologic Basis of Disease. – Elsevier Inc. - 7-th ed. – 2006. 1504 p.
3. Robbins Basic Pathology. 7-th ed. – 2006. 1058 p.
4. Essentials of Autopsy Practice. Current Methods and Modern Trends. - Springer-Verlag London Limited, 2006. – 247 p.
5. An Atlas of Tissue Biology and Pathology. - Springer-Verlag/Wien, 2005. – 341 p.
6. Killeen A. Principles of Molecular Pathology. - Humana Press Inc., 2004. – 344 p.
7. Cells, Tissues, and Disease: Principles of General Pathology , 2nd Edition. – 2004. - Oxford University Press.- 896 p.
8. Color Atlas of Pathology. - Stuttgart · New York, 2004. – 479 p.
9. USMLE' Step 1. Pathology Notes. - Kaplan, Inc., 2002 .- 308 p.
10. Scheider A., Szanto Ph. Pathology Tests. – Lippincott, 2002. – 488 p.
11. Robbins Review of Pathology – USMLE-style questions. – Saunders Company. – 2000. – 320 p.

#### Information resources

1. <http://vnmuedu.ua>
2. <http://library.vnmuedu.ua>
3. <http://www.who.int/en/>
4. <https://www.testcentr.org.ua/uk/>
5. <https://moz.gov.ua/>
6. <https://phc.org.ua/kontrol-zakhvoryuvan>
7. <http://patanatomy.vnmuedu.ua/>
8. <http://library.med.utah.edu/WebPath/webpath.html>
9. <http://www.webpathology.com/>
10. <https://www.geisingermedicallabs.com/lab/resources.shtml>
11. <https://www.rcpath.org/>
12. <https://www.cap.org/>
13. <https://www.nccn.org/>

**The timetable and distribution of groups** with assigned teachers are published on the web page of the department ((<https://www.vnmuedu.ua> / Department of Pathological Anatomy/ To students).

Questions to the intermediate and final semester control (credit) of the discipline are published on the web page of the department (<https://www.vnmuedu.ua>/ Department of Pathological Anatomy/ To students).

The syllabus of the discipline "PATHOMORPHOLOGY" was discussed and approved at the meeting of the department Pathomorphology I (record № \_\_\_\_, dated "\_\_\_\_" \_\_\_\_\_ 2023)

Redactor of syllabus



ass. prof. Halyna DATSENKO

Head of the pathological anatomy



assoc.profs. HEI Artur BEREZOVSKY