MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

SUMY STATE UNIVERSITY

Academic and Research Medical Institute

Кафедра патологічної анатомії

PATHOMORPHOLOGY

Higher education level	The Second
Major: study programme	222 Medicine: Medicine

Approved by Quality Council

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Protocol dated _____№ _____

Chairman of the Quality Council

_____

_____ Petrashenko Viktoriia Oleksandrivna

Sumy, 2023

DATA ON REVIEWS AND APPROVAL

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Review of the course descriptor	_____ _____
Considered and approved at the meeting of the work group of Study programme Медицина	Protocol dated _____№ _____ Head of the work group (Head of the Study programme) _____ Prystupa Liudmyla Nykodymivna
Considered and approved at the meeting of the Кафедра патологічної анатомії	Protocol dated _____№ _____ Head of the Department _____ Romaniuk Anatolii Mykolaiovych

ДАНІ АКТУАЛІЗАЦІЇ РОБОЧОЇ ПРОГРАМИ НАВЧАЛЬНОЇ ДИСЦИПЛІНИ

«Pathomorphology»

Робоча програма навчальної дисципліни переглянута, обговорена та схвалена до використання в 2023/2024 навчальному році на засіданні кафедри патологічної анатомії

№	Data of the review	Розділ РП (пункт)	Ініціатор змін	Обгрунтування внесення змін	Approved by the Department, date and protocol №	Head of the Department, signature	Head of the study programme, signature

SYLLABUS

1. General information on the course

Full course name	Pathomorphology
Full official name of a higher education institution	Sumy State University
Full name of a structural unit	Academic and Research Medical Institute. Кафедра патологічної анатомії
Author(s)	Hyriavenko Nataliia Ivanivna, Moskalenko Roman Andriiovych
Cycle/higher education level	The Second Level Of Higher Education, National Qualifications Framework Of Ukraine – The 7th Level, QF-LLL – The 7th Level, FQ-EHEA – The Second Cycle
Semester	18 weeks across 5 semester, 18 weeks across 6 semester
Workload	5 ECTS, 150 hours. For full-time course 96 hours are working hours with the lecturer (6 hours of lectures, 90 hours of seminars), 54 hours of the individual study.
Language(s)	English

2. Place in the study programme

Relation to curriculum	Compulsory course available for study programme "Medicine"
Prerequisites	Krok-1, Human Anatomy, Histology, Cytology and Embryology, Latin and Medical Terminology, Medical Biology, Microbiology, Virology and Immunology, Medical and Biological Physics, Human Physiology, Medical Chemisrty, Biological and Bioorganic Chemistry
Additional requirements	There are no specific requirements
Restrictions	There are no specific restrictions

3. Aims of the course

The goal of the educational discipline is to achieve students' modern knowledge and professional skills in the study of macro-, microscopic, and molecular-ultrastructural changes of the human body during the development of typical general pathological processes, the totality of which determines the morphological manifestations of diseases, their clinical manifestations, structural foundations recovery, complications, and consequences.

4. Contents

Module 1. General pathomorphology

Topic 1 Modern methods and techniques of pathomorphological diagnosis. Modern methods and techniques of pathomorphological diagnosis: biopsy, pathological-anatomical examination of operative and obstetric-gynecological material, pathological-anatomical dissection, and experimental reproduction of diseases. Features pathological autopsy in current conditions.
Topic 2 Modern methods and techniques of pathomorphological diagnosis. Methods of pathomorphological examination (macroscopic examination, methods of light microscopy, computer morphometry, cytospectrophotometry, electronic microscopy, molecular genetic methods, etc.)
Topic 3 Basics of thanatology. The birth and death of a human. The basics of thanatogenesis.
Topic 4 Basics of thanatology. The leading causes of biological death. Signs of biological death, cadaveric changes.
Topic 5 Molecular and ultrastructural cell pathology. Molecular and ultrastructural cell pathology. Typical ultrastructural changes of cells during their damage and their consequences. Diseases associated with cell organelle pathology.
Topic 6 Cellular dystrophies. Principles of classification of dystrophies. Morphology of cellular dystrophies.
Topic 7 Pathomorphology of accumulation of complex proteins and lipids. Cellular dystrophies. Pathomorphology of accumulation of complex proteins and lipids. Principles of classification of dystrophies.
Topic 8 Pathomorphological manifestations of cumulation of products of disturbed metabolism. Pathomorphological manifestations of accumulation of products of disturbed metabolism (disorders of iron metabolism and metabolism of hemoglobinogenic pigments, conditions of melanin formation, metabolism of nucleoproteins, copper). Calcification of tissues. Formation of stones in organs.
Topic 9 Damage and death of cells and tissues. Necrosis. Clinical and morphological classification of necrosis. Morphological manifestations of necrosis. Consequences.
Topic 10 Apoptosis. The concept of apoptosis. Morphologically visible manifestations of apoptosis. Pathogen-induced apoptosis. The main differences between pathogen-induced apoptosis and cell necrosis.
Topic 11 Disorders of blood and lymph circulation. Acute systemic circulatory disorders. Systemic circulatory diseases in chronic heart failure and cardiac decompensation. Regional blood circulation disorders (local venous and arterial hyperemia, ischemia, plasmarrhagia, bleeding, and hemorrhage). Violation of lymph formation and circulation.

Topic 12 Disorders of hemostasis. Embolism. Pathology of the hemostasis system. Hemorrhagic syndrome. Thrombosis. Thrombohemorrhagic syndrome, stages of development. Embolism: classification, pathogenesis, and thanatogenesis.
Topic 13 Violation of ion-osmotic and water balance. Violation of ion-osmotic and water balance. Consequences of breach of osmolality and osmolarity. Effects of disturbances in the proportion of sodium, potassium, and calcium ions.
Topic 14 Violation of the acid-base state. Violation of tissue fluid balance. Consequences of infringement of the acid-base state. Meaning in thanatogenesis. Manifestations violation of tissue fluid balance. Swelling of tissues and organs.
Topic 15 Inflammation. Pathogenesis of inflammation. Classification. Pathological and anatomical forms of exudative inflammation.
Topic 16 Inflammation. Proliferative inflammation. Classification. Specific granulomatous inflammation. Types of granulomas. Pathological anatomy of granulomas.
Topic 17 Compensatory and adaptive processes. Morphology of compensatory and adaptive changes in organs. Phases of development. Violation of adaptation processes at the level of the organism.
Topic 18 Regeneration. Types of regeneration. Features of reparative regeneration of specialized cells. Variants of reparative regeneration of organs.
Topic 19 Precancerous conditions. Precancerous conditions (obligatory and optional). Dysplasia.
Topic 20 Introduction to oncomorphology. Initiating factors of tumor growth. Anatomical and microscopic features of the tumor. Morphological characteristics of the main stages of the development of a malignant tumor. Pathomorphological classification of tumors.
Topic 21 Tumors of soft and other tissues. Benign and malignant non-epithelial (mesenchymal) tumors. Tumors of fibroblastic, myofibroblastic, fibrohistiocytic genesis, fat, muscle, bone, cartilage tissue, and vascular tumors.
Topic 22 Melanocytic tumors. Melanocytic tumors. Histological structure of nevi. Types of melanoma. Histological classification of melanoma according to Clark and Breslow.

Topic 23 Tumors of the nervous system and brain membranes. Teratomas.Features of childhood tumors. Tumors of the central nervous system. Features of CNS tumors, classification. Tumors of the central nervous system. Features of CNS tumors, classification. Tumors of cranial and paraspinal nerves. Teratomas. Peculiarities of childhood tumors. Embryonic tumors. Germinogenic tumors. Tumors of the "adult" type.
Topic 24 Epithelial tumors. Benign and malignant tumors from simple covering (transitional or multilayered flat) epithelium.
Topic 25 Epithelial tumors. Tumors from the specialized (glandular or integumentary) epithelium.
Topic 26 Solving the package of test tasks "Step 1". Solving the package of test tasks "Step 1".
Topic 27 Final module control of the 1st semester. Assessment of the student's knowledge of the theoretical questions of the final module. Evaluation of the development of practical skills (knowledge of gross specimens).
Module 2. Special pathomorphology
Topic 28 Diseases of the blood system. Anemia. Pathogenetic, morphological, and depending on the ability of bone marrow to regenerate classification of anemias. Etiology, mechanisms of development, morphological manifestations, consequences.
Topic 29 Tumors of hematopoietic and lymphoproliferative tissue. Groups of hemoblastosis. Etiology and pathogenesis of acute and chronic leukemias. Tumors of lymphoid origin, classification. Hodgkin's lymphoma. Tumors from precursors of T- and B-lymphocytes. Mature B-cell tumors. Diffuse B-cell large cell lymphoma. Burkitt's lymphoma. Follicular lymphoma. Plasma cell tumors. Tumors of myeloid origin.
Topic 30 Diseases of the cardiovascular system. Atherosclerosis and arteriosclerosis. Coronary heart disease. Hypertension and arteriolosclerosis. Etiology, mechanisms of development, morphological manifestations, classification, consequences.
Topic 31 Systemic diseases of connective tissue with autoimmunization. Rheumatism. Rheumatoid arthritis. Systemic lupus erythematosus. Scleroderma. Dermatomyositis. Bekhterev's disease. Etiology, mechanisms of development, morphological manifestations, classification, consequences.
Topic 32 Respiratory diseases. Classification and pathological anatomy of pneumonia. Complications and consequences. Lung abscess and gangrene. Etiology, pathogenesis and complications.

Topic 33 Chronic diffuse lung lesions. Tumors of bronchi and lungs. Chronic diffuse lung lesions: classification, etiology, pathogenesis, pathological anatomy and complications. Chronic bronchitis. Chronic obstructive emphysema. Bronchiectasis and bronchiectasis. Bronchial asthma. Acute and chronic interstitial lung diseases. Tumors of bronchi and lungs.
Topic 34 Diseases of esophagus and stomach. Diseases of the esophagus (developmental anomalies, achalasia of the cardia, esophagospasm, diverticula, Mallory-Weiss syndrome, esophagitis, gastroesophageal reflux disease, esophagus Barrett, tumors). Diseases of the stomach (gastritis, intestinal disease, tumors). Etiology, mechanisms of development, morphological manifestations, consequences.
Topic 35 Intestinal diseases. Intestinal diseases: enterocolitis, malabsorption syndrome, idiopathic inflammatory bowel diseases. Tumors of the small and large intestine. Appendicitis. Etiology, mechanisms development, morphological manifestations, consequences.
Topic 36 Diseases of the liver. Diseases of the gall bladder and submucosal gland. Liver disease: massive/submassive liver necrosis, hepatosis, hepatitis, alcoholic liver damage, liver cirrhosis, liver tumors. Inflammatory processes, formation of stones and tumors in the gallbladder. Acute and chronic pancreatitis. Pancreatic cancer. Mechanisms of development, morphological manifestations, classification, consequences. Etiology, mechanisms of development, morphological manifestations, classification, consequences.
Topic 37 Diseases of the nervous system Diseases of the central nervous system Cerebrovascular diseases. Mechanisms of development, morphological manifestations, classification, consequences. Post-resuscitation encephalopathy and brain death syndrome. Neurodegenerative (neurodystrophic) diseases.
Topic 38 Kidney diseases. Glomerulopathies (glomerulonephritis, renal amyloidosis, diabetic nephropathy and hepatic glomerulosclerosis). Tubulopathies. Polycystic kidney disease. Pyelonephritis. Acute and chronic renal failure. Etiology, mechanisms of development, morphological manifestations, consequences.
Topic 39 Diseases of the endocrine system. Hypothalamic-pituitary disorders. Adrenal gland pathology. Disease of the thyroid gland. Pathology of the endocrine apparatus of the pancreas. Diabetes (definition, classification, complications, causes of death).
Topic 40 Diseases of the female and male reproductive systems. Diseases of the female and male reproductive systems of an inflammatory nature. Precancerous processes and tumors of the reproductive system. Dyshormonal diseases. Etiology, mechanisms of development, morphological manifestations, classification, consequences.

Topic 41 Pathology of pregnancy, postpartum period, and placenta. Pre- and perinatal pathology. Complications of pregnancy: abortion, ectopic pregnancy, ectopic pregnancy, trophoblastic disease. Pathology of the placenta: inflammation, blood circulation disorders, placenta maturation pathology, implantation disorders, placental insufficiency, tumors. Pre- and perinatal pathology. Intrauterine growth retardation. of the fetus. Birth trauma. Mechanisms of development, morphological manifestations, classification, consequences.
Topic 42 Tuberculosis. Epidemiology, etiology, pathogenesis, morphogenesis, classification. Morphological characteristics of all forms of tuberculosis. Peculiarities of the course, main pathological and anatomical manifestations, complications.
Topic 43 Diseases of the musculoskeletal system. Diseases of the musculoskeletal system. Diseases of the musculoskeletal system. Arthropathy. Diseases of skeletal muscles. Pathological anatomy, complications.
Topic 44 Infectious and parasitic diseases. Especially dangerous (quarantine) infections. Classification of infectious diseases. Intestinal infectious diseases (typhoid, paratyphoid A and B, salmonellosis, shigellosis, yersiniosis, staphylococcal enteritis). Especially dangerous infections: plague, tularemia, anthrax, and cholera. Main morphological manifestations, consequences, and causes of death.
Topic 45 Viral airborne infections. Children's infections. HIV infection and acquired immunodeficiency syndrome (AIDS). Influenza, parainfluenza, respiratory syncytial infection, adenovirus infection. Children's infections (measles, epidemic mumps, infectious mononucleosis, poliomyelitis, chicken pox, rubella, whooping cough, diphtheria, scarlet fever, meningococcal infection). Main morphological manifestations, consequences, and causes of death. Etiology, pathogenesis, and stages of the disease. Clinical characteristics of HIV infection and AIDS. Clinical and morphological characteristics of the most important opportunistic infections. AIDS-related diseases.
Topic 46 Practically oriented exam Conducting the exam in accordance with the regulations.

5. Intended learning outcomes of the course

After successful study of the course, the student will be able to:

LO1	To be able to identify and record the main changes in internal organs during various pathological processes, using knowledge about a person, his organs, and systems, observing the relevant ethical and legal norms.
LO2	To be able to formulate clinical and patho-anatomical diagnoses in the conditions of a health care institution, having specialized knowledge about the structural basis of the development of diseases and their clinical manifestations, the basics of recovery, complications, consequences, and the main causes of death.
LO3	To be able to apply the acquired knowledge of pathomorphology in practical activities during the differential diagnosis of diseases, being able to think abstractly, analyze and synthesize information.

LO4	Be able to keep medical records and use modern digital technologies, specialized software, and statistical methods of data analysis to solve complex healthcare problems.

6. Role of the course in the achievement of programme learning outcomes

Programme learning outcomes achieved by the course.
For 222 Medicine:

PO5	Collect complaints, history of life and diseases, evaluate psychomotor and physical development of the patient, state of organs and systems of the body, based on the results of laboratory and instrumental studies, assess information regarding the diagnosis (according to list 4), taking into account the age of the patient.
PO6	Establish a final clinical diagnosis by acceptance reasoned decision and analysis of the obtained subjective and objective data of clinical, additional examination, carrying out differential diagnosis, observing the relevant ethical and legal norms, under the head physician's control in the health care institution (according to list 2).
PO7	Assign and analyze additional (mandatory and optional) examination methods (laboratory, functional, and/or instrumental) (according to list 4) of patients with diseases of organs and body systems for differential diagnosis of diseases (according to list 2).
PO21	Search for the necessary information in the professional literature and databases of other sources, and analyze, evaluate, and apply this information.

7. Soft Skills

SS1	Ability to abstract thinking, analysis and synthesis.
SS2	Ability to learn and master modern knowledge.
SS3	Ability to apply knowledge in practical situations.
SS4	Knowledge and understanding of the subject area and understanding of professional activity.
SS5	Ability to search, process and analyze information from various sources.

8. Teaching and learning activities

Topic 1. Modern methods and techniques of pathomorphological diagnosis.

pr.tr.1 "Modern methods and techniques of pathomorphological diagnosis." (full-time course)

Modern methods and techniques of pathomorphological diagnosis: biopsy (types according to the method of obtaining diagnostic material, according to the time of getting a morphological diagnosis), pathological-anatomical examination of operative and obstetric-gynecological material, pathological-anatomical dissection, experimental reproduction of diseases. Features pathological-anatomical autopsy in current conditions. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, and practical work in the laboratory of the Scientific Center for Pathomorphological Research and the section hall (according to the agreement on cooperation between the medical institution and the university).

Topic 2. Modern methods and techniques of pathomorphological diagnosis.

pr.tr.2 "Modern methods and techniques of pathomorphological diagnosis." (full-time course)

Methods of pathomorphological examination (macroscopic examination, methods of light microscopy, computer morphometry and cytospectrophotometry, electronic microscopy, molecular genetic methods, etc.). The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, and practical work in the Scientific Center for Pathomorphological Research laboratory.

Topic 3. Basics of thanatology.

pr.tr.3 "Basics of thanatology." (full-time course)

The birth and death of a person. The basics of thanatogenesis. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, and work in the section hall (according to the agreement on cooperation between the medical institution and the university, studying the signs of biological death, and cadaveric changes)—application of virtual simulation (watching films) with further discussion.

Topic 4. Basics of thanatology.

pr.tr.4 "Basics of thanatology." (full-time course)

The leading causes of biological death. Signs of biological death, cadaveric changes. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, and work in the section hall (according to the agreement on cooperation between medical institutions and universities, the study of signs of biological death, and cadaveric changes). Application of virtual simulation (watching films) with further discussion.

Topic 5. Molecular and ultrastructural cell pathology.

pr.tr.5 "Molecular and ultrastructural cell pathology." (full-time course)

Molecular and ultrastructural cell pathology. Typical ultrastructural changes of cells during their damage and their consequences. Diseases associated with cell organelle pathology. The study of this topic involves theoretical work in the classroom, a survey on the subject of the lesson, testing, viewing the micropreparations of the museum of the department, and practical work in the laboratory of the Scientific Center for Pathomorphological Research

Topic 6. Cellular dystrophies.

pr.tr.6 "Cellular dystrophies." (full-time course)

Principles of classification of cell dystrophies. Morphology of cellular dystrophies. The study of this topic involves theoretical work in the classroom, a survey on the subject of the lesson, testing, and viewing the macro-preparations of the department's museum with an assessment of macroscopic changes.

Topic 7. Pathomorphology of accumulation of complex proteins and lipids.

pr.tr.7 "Pathomorphology of accumulation of complex proteins and lipids." (full-time course)

Cellular dystrophies. Pathomorphology of accumulation of complex proteins and lipids. Principles of classification of dystrophies. The study of this topic involves theoretical work in the classroom, a review of the macro-preparations of the museum of the department with an assessment of macroscopic changes in this pathology (fatty liver dystrophy, cardiac obesity, squamous cell skin cancer with keratinization, etc.).

Topic 8. Pathomorphological manifestations of cumulation of products of disturbed metabolism.

pr.tr.8 "Pathomorphological manifestations of accumulation of products of disturbed metabolism." (full-time course)

Pathomorphological manifestations of the accumulation of products of disturbed metabolism (disorders of iron metabolism and metabolism of hemoglobinogenic pigments, conditions of melanin formation, exchange of nucleoproteins, copper). Calcification (calcification) of tissues. Formation of stones in organs. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, and viewing macro and micro specimens of the museum department with an evaluation of macro and microscopic changes (liver with mechanical jaundice, melanoma of the skin).

Topic 9. Damage and death of cells and tissues.

pr.tr.9 "Damage and death of cells and tissues." (full-time course)

Necrosis. Clinical and morphological classification of necrosis. Morphological manifestations of necrosis. Consequences. The study of this topic involves theoretical work in the classroom, a survey on the subject of classes, testing, a review of macro-preparations of the department museum with an assessment of macroscopic changes in this pathology, a study of micro-preparations (necrotic nephrosis, hemorrhagic lung infarction, myocardial infarction), application of virtual simulation (viewing of films depicting the primary morphological forms of tissue necrosis) with further discussion.

Topic 10. Apoptosis.

pr.tr.10 "Apoptosis." (full-time course)

The concept of apoptosis. Morphologically visible manifestations of apoptosis. Pathogen-induced apoptosis. The main differences between pathogen-induced apoptosis and cell necrosis. The study of this topic involves theoretical work in the classroom, a survey on the subject of the lesson, testing, viewing macro-preparations of the department museum with an assessment of macroscopic changes, viewing micro-preparations, and using virtual simulation, (viewing films) followed by a discussion of the differences between pathogen-induced apoptosis and cell necrosis.

Topic 11. Disorders of blood and lymph circulation.

pr.tr.11 "Disorders of blood and lymph circulation" (full-time course)

Acute systemic circulatory diseases. Systemic circulatory diseases in chronic heart failure and cardiac decompensation. Regional disorders of blood circulation (local venous and arterial hyperemia, ischemia, plasmarrhagia, bleeding, and hemorrhage). Violation of lymph formation and circulation. The study of this topic involves theoretical work in the classroom, a survey on the subject of the lesson, testing, a review of macro preparations of the department museum with an assessment of macroscopic changes in this pathology, a study of micropreparations (hyperemia of the lungs, stasis in the capillaries of the brain, "nutmeg liver," lung induration), application of virtual simulation (watching films depicting the significant disorders of blood and lymph circulation) with further discussion.

Topic 12. Disorders of hemostasis. Embolism.

pr.tr.12 "Disorders of hemostasis. Embolism." (full-time course)

Pathology of the hemostasis system. Hemorrhagic syndrome. Thrombosis. Thrombohemorrhagic syndrome, stages of development. Embolism: classification, pathogenesis, and thanatogenesis. Studying the data of the topic involves theoretical work in the classroom, a survey on the subject of the lesson, testing, review of macro-preparations of the department museum with an evaluation of macroscopic changes in this pathology, review of micro-preparations (thromboembolism of the pulmonary artery), application of virtual simulation (viewing of films depicting the main types of embolism) with further discussion.

Topic 13. Violation of ion-osmotic and water balance.

pr.tr.13 "Violation of ion-osmotic and water balance." (full-time course)

Violation of ion-osmotic and water balance, acid-base state. Consequences of breach of osmolality and osmolarity. Effects of disturbances in the proportion of sodium ions, potassium, and calcium. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, review of micropreparations, and work in the section hall (according to the agreement on cooperation between the medical institution and university).

Topic 14. Violation of the acid-base state. Violation of tissue fluid balance.

pr.tr.14 "Violation of the acid-base state. Violation of tissue fluid balance." (full-time course)

Consequences of violation of the acid-base state. Violation of tissue fluid balance. Edema of tissue and organs (acute pulmonary edema, swelling, and edema of the brain). Systemic edema of the body. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, review of microslides (pulmonary edema, cerebral edema), discussion of interesting cases, work in the section hall (according to the cooperation agreement between the medical institution and the university).

Topic 15. Inflammation.

pr.tr.15 "Inflammation." (full-time course)

Pathogenesis of inflammation. Classification. Pathological and anatomical forms of exudative inflammation. The study of this topic involves theoretical work in the classroom, surveys for the case of classes, testing, review of macro-preparations of the museum of the department with an assessment of macroscopic changes in this pathology, review of micro-preparations (croupous pneumonia, phlegmonous appendicitis, acute lung abscess), application of virtual simulation (viewing of films depicting the primary forms of exudative inflammation and discussion of interesting cases).

Topic 16. Inflammation.

pr.tr.16 "Inflammation." (full-time course)

Proliferative inflammation. Classification. Specific granulomatous inflammation. Types of granulomas. Pathological anatomy of granulomas. The study of this topic involves a theoretical one work in the classroom, a survey on the subject of the lesson, testing, viewing macro-preparations of the museum of the department with an assessment of macroscopic changes in this pathology, viewing micro-preparations (syphilitic mesaorthitis, tuberculoma), application of virtual simulation (viewing films depicting the primary forms of proliferative inflammation and specific granulomatous inflammation) with further discussion.

Topic 17. Compensatory and adaptive processes.

pr.tr.17 "Compensatory and adaptive processes." (full-time course)

Morphology of compensatory and adaptive changes in organs. Phases of development. Violation of adaptation processes at the level of the organism. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, viewing macro-preparations of the department museum with an assessment of macroscopic changes in this pathology, viewing micro-preparations (adenomatous hyperplasia of the prostate gland, liver cyst), use of virtual simulation (viewing films depicting the main morphological compensatory and adaptive changes organs) and further discussion of interesting cases.

Topic 18. Regeneration.

pr.tr.18 "Regeneration." (full-time course)

Types of regeneration. Features of reparative regeneration of specialized cells. Variants of reparative regeneration of organs. The study of this topic involves theoretical work in study room, survey on the lesson subject, testing, review of micropreparations (granulation tissue, post-infarction cardiosclerosis), work in the section hall (according to the cooperation agreement between the medical institution and the university).

Topic 19. Precancerous conditions.

pr.tr.19 "Precancerous conditions." (full-time course)

Precancerous conditions (facultative and obligatory). Dysplasia, other types. The study of this topic involves theoretical work in the classroom, a survey on the subject of the lesson, testing, review of micro-preparations (severe cervical dysplasia, pigmented xeroderma of the skin, Bowen's disease), work in the operating room, and practical skills in cutting postoperative and biopsy material (according to the agreement on cooperation between the medical institution and the university).

Topic 20. Introduction to oncomorphology.

pr.tr.20 "Introduction to oncomorphology." (full-time course)

Initiating factors of tumor growth. Anatomical and microscopic features of the tumor. Morphological characteristics of the main stages of the development of a malignant tumor. Pathomorphological classification of tumors. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, viewing macro preparations of the department museum on the subject of the study with their evaluation, application virtual simulation (viewing films depicting the main ways of metastasis of malignant tumors and clinical and anatomical differences between benign and malignant tumors) with further discussion.

Topic 21. Tumors of soft and other tissues.

pr.tr.21 "Tumors of soft and other tissues." (full-time course)

Benign and malignant non-epithelial (mesenchymal) tumors. Tumors of fibroblastic, myofibroblastic, fibrohistiocytic genesis, fat, muscle, bone, cartilage tissue, and vascular tumors. The study of this topic involves theoretical work in the classroom, a survey on the subject of the lesson, testing, review of micropreparations (lipoma, uterine leiomyoma, cavernous hemangioma of the liver), visit to the cutting of postoperative and biopsy material on the topic of the lesson (according to the cooperation agreement between the medical institution and the university).

Topic 22. Melanocytic tumors.

pr.tr.22 "Melanocytic tumors." (full-time course)

Melanocytic tumors. Histological structure of nevi. Types of melanoma. Histological classification of melanoma according to Clark and Breslow. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, review of macropreparations of the museum of the department according to the issue of the class with their evaluation, assessment of micropreparations (complex nevus, pigmented melanoma of the skin). Interpretation of histological examination results, drawing up a plan for immunohistochemical examination in case of suspicion of melanoma.

Topic 23. Tumors of the nervous system and brain membranes. Teratomas.Features of childhood tumors.

pr.tr.23 "Tumors of the nervous system and brain membranes. Teratomas.Features of childhood tumors." (full-time course)

Tumors of the central nervous system. Features of CNS tumors, classification. Tumors of cranial and paraspinal nerves. Teratomas. Characteristics of childhood tumors. Embryonic tumors. Germinogenic tumors. Tumors of the "adult" type. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, viewing macro-preparations from the museum of the department with an assessment of macroscopic changes in this pathology, viewing micro-preparations (anaplastic astrocytoma, schwannoma), the use of virtual simulation (viewing films depicting the leading representatives of tumors of the central and peripheral nervous system) and further discussion of interesting cases.

Topic 24. Epithelial tumors.

pr.tr.24 "Epithelial organ-nonspecific tumors." (full-time course)

Benign and malignant tumors from simple covering (transitional or multilayered flat) epithelium. The study of this topic involves theoretical work in the classroom, a survey on the subject of the lesson, testing, visiting a cutting board postoperative, and biopsy material according to the topic of the study (according to the cooperation agreement between the medical institution and the university).

Topic 25. Epithelial tumors.

pr.tr.25 "Epithelial organ-specific tumors." (full-time course)

Tumors from the specialized (glandular or integumentary) epithelium. The study of this topic involves theoretical work in the classroom, a survey on the subject of the lesson, testing, review of micropreparations (hepatocellular carcinoma, follicular adenoma of the thyroid gland, cystic drift), visit to the cutting of postoperative and biopsy material according to the subject of the class and work in the section hall (according to the agreement on cooperation between the medical institution and the university).

Topic 26. Solving the package of test tasks "Step 1".

pr.tr.26 "Solving the package of test tasks "Step 1"." (full-time course)

Solving the package of test tasks "Step 1".

Topic 27. Final module control of the 1st semester.

pr.tr.27 "Final module control of the 1st semester." (full-time course)

Assessment of the student's knowledge of the theoretical questions of the final module. Evaluation of the development of practical skills (knowledge of gross specimens).

Topic 28. Diseases of the blood system.

pr.tr.28 "Anemia." (full-time course)

Pathogenetic, morphological, and depending on the ability of bone marrow to regenerate classification of anemias. Etiology, mechanisms of development, morphological manifestations, consequences. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, viewing macro-preparations of the department museum with an assessment of macroscopic changes in this pathology, viewing micro-preparations (hemosiderosis of the liver and kidneys), the use of virtual simulation (viewing films depicting the main mechanisms of anemia with characteristic changes in internal organs) with their further discussion.

Topic 29. Tumors of hematopoietic and lymphoproliferative tissue.

pr.tr.29 "Tumors of hematopoietic and lymphoproliferative tissue." (full-time course)

Groups of hemoblastosis. Etiology and pathogenesis of acute and chronic leukemias. Tumors of lymphoid origin, classification. Hodgkin's lymphoma. Tumors from precursors of T- and B-lymphocytes. Mature B-cell tumors. Diffuse B-cell large cell lymphoma. Burkitt's lymphoma. Follicular lymphoma. Plasma cell tumors. Myeloid tumors genesis The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, the use of virtual simulation (review films depicting the primary tumors of lymphoid origin, familiarization with immunohistochemical markers of their diagnosis) and further discussion of their morphological diagnosis. Visiting the laboratory of the Pathomorphological Center research and review of micropreparations on the lesson's subject.

Topic 30. Diseases of the cardiovascular system.

pr.tr.30 "Diseases of the cardiovascular system." (full-time course)

Endocardial and myocardial diseases. Atherosclerosis and arteriosclerosis. Coronary heart disease. Hypertension and arteriolosclerosis. Etiology, mechanisms of development, morphological manifestations, classification, consequences. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, viewing microslides (stenotic atherosclerosis of the coronary artery, acute myocardial infarction, atherosclerotic cardiosclerosis), work in the operating room (according to the cooperation agreement between the medical institution and the university).

Topic 31. Systemic diseases of connective tissue with autoimmunization.

pr.tr.31 "Systemic diseases of connective tissue with autoimmunization." (full-time course)

Rheumatism. Rheumatoid arthritis. Systemic lupus erythematosus. Scleroderma. Dermatomyositis. Bekhterev's disease. Etiology, mechanisms of development, morphological manifestations, classification, consequences. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, review of the macro-preparations of the department museum on the subject of the lesson with their assessment and discussion of interesting cases, viewing microslides (acute warty endocarditis, glomerulonephritis in systemic lupus erythematosus), the use of virtual simulation (viewing films depicting the leading representatives of collagenases and their clinical and morphological signs) with further discussion.

Topic 32. Respiratory diseases.

pr.tr.32 "Acute inflammatory lung diseases." (full-time course)

Classification and pathological anatomy of pneumonia. Complications and consequences. Lung abscess and gangrene. Etiology, pathogenesis, and complications. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, review of macropreparations of the museum of the department, review of micropreparations (croupous pneumonia, lung gangrene), work in the section hall (according to the agreement on cooperation between the medical institution and the university).

Topic 33. Chronic diffuse lung lesions. Tumors of bronchi and lungs.

pr.tr.33 "Chronic diffuse lung lesions. Tumors of bronchi and lungs." (full-time course)

Chronic diffuse lung lesions: classification, etiology, pathogenesis, pathological anatomy, and complications. Chronic bronchitis. Chronic obstructive emphysema. Bronchiectasis and bronchiectasis. Bronchial asthma. Acute and chronic interstitial lung diseases. Tumors of the bronchi and lungs. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, review of macro-preparations of the museum of the department with an evaluation of macroscopic changes in this pathology, review of micro-preparations (pneumosclerosis, emphysema of the lung, lung adenocarcinoma), the use of virtual simulation (viewing films depicting the main chronic diffuse lung lesions, morphological features of bronchial and lung tumors) followed by a discussion of immunohistochemical markers for the diagnosis of malignant tumors of this localization.

Topic 34. Diseases of esophagus and stomach.

pr.tr.34 "Diseases of esophagus and stomach." (full-time course)

Diseases of the esophagus (developmental anomalies, achalasia of the cardia, esophagospasm, diverticula, Mallory-Weiss syndrome, esophagitis, gastroesophageal reflux disease, esophagus Barrett, tumors). Diseases of the stomach (gastritis, intestinal disease, tumors). Etiology, mechanisms of development, morphological manifestations, consequences. The study of this topic involves theoretical work in the classroom, a survey on the subject of the lesson, testing, visiting the clipping of postoperative material on the subject of the study (according to the agreement on cooperation between the medical institution and the university), review of macro- and micro-preparations of the museum of the department (gastric ulcer-cancer, chronic gastric ulcer, Menetriere's disease).

Topic 35. Intestinal diseases.

pr.tr.35 "Intestinal diseases." (full-time course)

Intestinal diseases: enterocolitis, malabsorption syndrome, idiopathic inflammatory bowel diseases. Tumors of the small and large intestine. Appendicitis. Etiology, mechanisms development, morphological manifestations, consequences. The study of this topic involves theoretical work in the classroom, a survey on the subject of the lesson, testing, a review of the macro-preparations of the museum of the department with an assessment of macroscopic changes in this pathology, a study of micropreparations (Crohn's disease, gangrenous appendicitis), use of virtual simulation (viewing films depicting the major intestinal diseases, differential morphological diagnosis of Crohn's disease and non-specific ulcerative colitis) with further discussion of interesting cases from practice.

Topic 36. Diseases of the liver. Diseases of the gall bladder and submucosal gland.

lect.1 "Diseases of the liver. Diseases of the gall bladder and submucosal gland." (full-time course)

Hepatic diseases. Gallbladder and submucous gland diseases." (daytime) Liver disease: massive/submassive liver necrosis, hepatosis, hepatitis, alcoholic liver damage, liver cirrhosis, liver tumors. Etiology, mechanisms of development, morphological manifestations, classification, consequences. Teaching is conducted as a multimedia problem-oriented lecture on the discussion of compelling cases by topic (if there is a quarantine - in online mode).

pr.tr.36 "Liver disease." (full-time course)

Liver disease: massive/submassive liver necrosis, hepatosis, hepatitis, alcoholic liver damage, liver cirrhosis, liver tumors. Etiology, mechanisms development, morphological manifestations, classification, consequences. The study of this topic involves theoretical work in the classroom, surveys on the topic of the lesson, testing, work in the section hall (according to the agreement on cooperation between the medical institution and the university), review of macro- and micro-preparations of the museum of the department (toxic dystrophy liver, portal cirrhosis of the liver).

Topic 37. Diseases of the nervous system

pr.tr.37 "Diseases of the nervous system" (full-time course)

Diseases of the central nervous system Cerebrovascular diseases. Mechanisms of development, morphological manifestations, classification, consequences. Post-resuscitation encephalopathy and brain death syndrome. Neurodegenerative (neurodystrophic) diseases. The study of this topic involves theoretical work in the classroom, surveys on the topic classes, testing, visit cuttings of postoperative and biopsy material according to the subject of the course (according to the agreement on cooperation between the medical institution and the university), review of macro- and micro-preparations of the museum of the department (intracerebral hemorrhage, cerebral infarction).

Topic 38. Kidney diseases.

pr.tr.38 "Kidney diseases." (full-time course)

Glomerulopathies (glomerulonephritis, renal amyloidosis, diabetic nephropathy,y, and hepatic glomerulosclerosis). Tubulopathies. Polycystic kidney disease. Pyelonephritis. Acute and chronic kidney failure. Etiology, mechanisms of development, morphological manifestations, consequences. The study of this topic involves theoretical work in the study room, surveys on the topic of the lesson, testing, viewing macropreparations of the museum of the department of assessment of macroscopic changes in this pathology, review of micropreparations (necrotic nephrosis, chronic pyelonephritis), use of virtual simulation (viewing films depicting the main kidney diseases and their differential morphological diagnostics) with further discussion of the material and exciting cases.

Topic 39. Diseases of the endocrine system.

lect.2 "Pathology of the thyroid gland." (full-time course)

Pathology of the thyroid gland: goiter, thyroiditis, benign and malignant tumors. Morphological manifestations, classification, consequences. Teaching is a multimedia problem-oriented lecture discussing compelling cases by topic. (in case of quarantine - in online mode).

pr.tr.39 "Diseases of the endocrine system." (full-time course)

Hypothalamic-pituitary disorders. Adrenal gland pathology. Disease of the thyroid gland. Pathology of the endocrine apparatus of the pancreas. Diabetes mellitus (definition, classification. complications, causes of death). Study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, visiting the cutting of postoperative and biopsy material on the case of the study (according to the agreement on cooperation between the medical institution and the university), viewing macro- and micro-preparations of the museum of the department.

Topic 40. Diseases of the female and male reproductive systems.

pr.tr.40 "Diseases of the female and male reproductive systems." (full-time course)

Diseases of the female and male reproductive systems of an inflammatory nature. Precancerous processes and tumors of the reproductive system. Dyshormonal diseases. Etiology, mechanisms of development, morphological manifestations, classification, consequences. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, and viewing macro- and micro-preparations of the department's museum on the topic—discussion of interesting cases.

Topic 41. Pathology of pregnancy, postpartum period, and placenta. Pre- and perinatal pathology.

pr.tr.41 "Pathology of pregnancy, postpartum period, and placenta. Pre- and perinatal pathology." (full-time course)

Complications of pregnancy: abortion, ectopic pregnancy, ectopic pregnancy, trophoblastic disease. Pathology of the placenta: inflammation, blood circulation disorders, placenta maturation pathology, implantation disorders, placental insufficiency, tumors. Pre- and perinatal pathology, delay in intrauterine development of the fetus. Birth trauma. Mechanisms of action, morphological manifestations, classification, consequences. The study of this topic involves theoretical work in the classroom, surveys on the case of the lesson, testing, and viewing macro- and micropreparations of the department museum according to the subject of the lesson.

Topic 42. Tuberculosis.

lect.3 "Tuberculosis." (full-time course)

Epidemiology, etiology, pathogenesis, morphogenesis, classification. Morphological characteristics of primary tuberculosis. Features of the course. Hematogenous tuberculosis: forms, main pathological and anatomical manifestations, complications. Teaching is held in the form of a multimedia problem-oriented lecture on the discussion of compelling cases by topic (if there is a quarantine - in online mode).

pr.tr.42 "Tuberculosis." (full-time course)

Epidemiology, etiology, pathogenesis, morphogenesis, classification. Morphological characteristics of primary tuberculosis. Features of the course. Hematogenous tuberculosis: forms, main pathological and anatomical manifestations, complications. Study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, viewing macro-preparations of the department museum with an assessment of macroscopic changes in this pathology, viewing micro-preparations, using virtual simulation (viewing films depicting the main manifestations of tuberculosis and their differential morphological diagnostics) with further discussion of the material and exciting cases.

Topic 43. Diseases of the musculoskeletal system.

pr.tr.43 "Diseases of the musculoskeletal system." (full-time course)

Diseases of the musculoskeletal system. Arthropathy. Disorders of skeletal muscles. Pathological anatomy, complications. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, viewing macro-preparations of the department museum with an assessment of macroscopic changes in this pathology, viewing micro-preparations (cirrhotic tuberculosis, tuberculoma), application of virtual simulation (viewing films depicting the main manifestations of secondary tuberculosis and their differential morphological diagnosis) with further discussion.

Topic 44. Infectious and parasitic diseases. Especially dangerous (quarantine) infections.

pr.tr.44 "Infectious and parasitic diseases. Especially dangerous (quarantine) infections." (full-time course)

Classification of infectious diseases. Intestinal infectious diseases (typhoid, paratyphoid A and B, salmonellosis, shigellosis, yersiniosis, staphylococcal enteritis). Dangerous infections: plague, tularemia, anthrax, and cholera. The study of this topic involves theoretical work in the classroom, surveys on the subject of the lesson, testing, viewing macro preparations of the museum of the department with an assessment of macroscopic changes in this pathology, review of micropreparations, application of virtual simulation (viewing of films depicting the main manifestations of infectious and parasitic diseases and their differential diagnosis) with further discussion.

Topic 45. Viral airborne infections. Children's infections. HIV infection and acquired immunodeficiency syndrome (AIDS).

pr.tr.45 "Viral airborne infections. Children's infections. HIV infection and acquired immunodeficiency syndrome (AIDS)." (full-time course)

Influenza, parainfluenza, respiratory syncytial infection, adenovirus infection. Children's infections (measles, epidemic parotitis, infectious mononucleosis, poliomyelitis, chicken pox, rubella, whooping cough, diphtheria, scarlet fever, meningococcal infection). HIV infection and acquired immunodeficiency syndrome (AIDS). The main morphological manifestations, consequences, and causes of death. The study of this topic involves theoretical work in the classroom, a survey on the subject of the lesson, testing, viewing macro-preparations of the department museum with an assessment of macroscopic changes in this pathology, viewing micro-preparations, using virtual simulation (viewing films with images the main morphological manifestations of airborne viral infections and their differential diagnosis) with further discussion.

Topic 46. Practically oriented exam

assessm.1 "Practically oriented exam" (full-time course)

Conducting the exam in accordance with the regulations.

9. Teaching methods

9.1 Teaching methods

Course involves learning through:

TM1	Lecture teaching
TM2	Case-based learning

TM3	Team Based Learning
TM4	Research Based Learning
TM5	Practical training
TM6	Self-study
TM7	Electronic learning

The discipline is taught using modern teaching methods (CBL, TBL, RBL), which contribute not only to the development of professional abilities, but also encourage creativity thinking.

Acquisition of soft skills by students is carried out during the entire period of studying the discipline. Ability to analytical and critical thinking, teamwork, perseverance is formed during team-, practice- and case-oriented training, knowledge and understanding of the subject area is acquired during lectures and self-study. Electronic training stimulates the ability to use information technologies. Training on on the basis of research encourages the development of certainty and persistence in relation to the set tasks and assumed responsibilities.

9.2 Learning activities

LA1	Electronic learning in systems (Zoom, MIX.sumdu.edu.ua)
LA2	Interactive lectures
LA3	Preparation for Step-1
LA4	Preparation for certification
LA5	Preparation for practical classes
LA6	Analysis and discussion of cases (educational/practical/research)
LA7	Participation in discussion-discussions (group and pair)
LA8	Interpretation of histological micropreparations.
LA9	Working with textbooks and relevant information sources
LA10	Individual research project (student research paper, article, theses, etc.)
LA11	Practicing practical skills in the classroom.

10. Methods and criteria for assessment

10.1. Assessment criteria

Definition	National scale	Rating scale
Outstanding performance without errors	5 (Excellent)	$170 \leq RD \leq 200$
Above the average standard but with minor errors	4 (Good)	$140 \leq RD < 169$
Fair but with significant shortcomings	3 (Satisfactory)	$120 \leq RD < 139$
Fail – some more work required before the credit can be awarded	2 (Fail)	$0 \leq RD < 119$

10.2 Formative assessment

	Description	Deadline, weeks	Feedback
FA1 Peer assessment	Partnership interaction, aimed at improving the results of educational activities for comparison of own current level of success with previous ones indicators. Provides possibility of analysis own education activity	During the entire period of studying the discipline.	Adjustment of approaches to learning together with students, taking into account the results of the assessment
FA2 Survey on the topic of the practical session and the teacher's oral comments on its results	Provides an opportunity to reveal the condition of the purchased item students of experience educational activity according to set goals, find out the prerequisites state of formation of the obtained results, causes of occurrence difficulties, adjust learning process, track the dynamics formation of results training and predict them development.	During the entire period of studying the discipline	According to the obtained data on the results of training, based on their analysis, it is proposed to determine the evaluation as an indicator of the achievements of the educational activities of the applicants
FA3 Solving situational tasks from Step-1	The effective method level checks assimilation of knowledge, skills and skills from each topic academic discipline. Testing allows check learning educational material from of each topic	During the entire period of studying the discipline	the student must provide 60% of the correct answers, which is an admission to the practical part of the lesson
FA4 Solving clinical cases with the analysis of macroscopic changes in internal organs in various pathological processes	The case method allows to reveal and form necessary for further labor activity qualities and abilities medical students, forms clinical thinking, analytical abilities, independence in making a decision, communication skills, skills to work with big enough volume of information.	During the entire period of studying the discipline	Assessment of the student's ability to think clinically, justify their decisions, clearly express their opinions, determine the level of theoretical training, which is reflected in the corresponding assessment

FA5 Interpretation of histological preparations	Level check acquisition of knowledge, ability to interpret changes in internal organs in histological preparations from each topic. academic discipline	During the entire period of studying the discipline	According to the obtained data on the results of training, based on their analysis, it is proposed to determine the evaluation as an indicator of the achievements of the educational activities of the applicants
FA6 Participation in discussions-discussions	The method allows involve all participants to the discussion process and justification by own thought multilateral communications, develop the ability to conduct a professional discussion, educate respect for colleagues and ability to generate alternative ideas and proposals	During the entire period of studying the discipline	Assessment of the student's ability to work in a team, ability to justify their decisions, determination of the level of theoretical training, which is reflected in the corresponding assessment
FA7 Consulting the teacher during the preparation of an individual research project (speech at a conference, competition of scientific papers)	An important factor formation professional qualities there are future specialists Scientific research work students Involvement the last to research activity contributes to the formation their scientific outlook, hard work, working capacity, initiative, etc.	During the entire period of studying the discipline	Teacher's oral comments. The student is given additional incentive points (from 5 to 10), depending on the type of research project

FA8 Final testing	The effective method level checks assimilation of knowledge, skills and educational skills disciplines Testing allows you to check results of training on completion of the discipline.	In the penultimate class of discipline.	The maximum number of points for the test is 20 points, provided that 100% of the answers are correct. The minimum score for successfully passing the tests is 12 points (60% of correct answers)
FA9 Practical skills test	Practicing practical skills in the classroom.	During the entire period of study. At the last lesson, the student must successfully perform practic	Successful completion of practical skills in the discipline is a prerequisite for taking the exam. The maximum number of points is 20, the minimum is 12
FA10 Instructions of the teacher in the process of performing practical tasks	In the instructions methods are disclosed pedagogical control by professional activities of acquirers. Efficiency is defined compliance with all stages implementation of practical tasks Effectiveness formation necessary practical abilities and skills depends on the level formation practical competence.	During the entire period of studying the discipline	Advising students in class work and determining the level of practical training
FA11 Tests (automated tests) to control the educational achievements of applicants	The effective method level checks assimilation of knowledge, skills and skills from each topic academic discipline. Testing allows check learning educational material from of each topic.	During the entire period of studying the discipline	the student must provide 60% of the correct answers, which is an admission to the practical part of the lesson

10.3 Summative assessment

	Description	Deadline, weeks	Feedback

SA1 Final control: exam	Drafting practical-oriented exam. Before passing the exam are allowed acquirers who successfully mastered the material from disciplines, made practical skills and final computer testing.	According to the schedule	The applicant can get 80 points for the exam. The minimum number of points a student must receive is 48 points
SA2 Final testing	Method of effective verification level of assimilation of knowledge, skills and educational skills disciplines Testing allows you to check the results learning throughout the cycle and determine the level of knowledge completion of the discipline	Final computer test at the end of the course (20 points)	It is an admission to take the exam
SA3 Examinetion of performance of practical skills	Comprehensive training practical component of programs academic disciplines. Provides an opportunity master skills (histomorphological examination of lymph node tissue, tissues of internal organs, mucous membranes, muscles and skin).	At the last discipline lesson, the student must successfully complete a list of practical skills	It is mandatory for admission to the exam. The maximum number of points is 20, the minimum is 12
SA4 Current examination of the level of theoretical and practical training	Includes oral survey, interpretation macro- and microscopic changes in internal organs, solving clinical individual and group problems cases, ongoing testing. Students who are involved in research activities, to be able to present results of own research at conferences, competitions student research papers etc. (promotional activity, additional points).	During the entire period of studying the discipline	Held at each class, the result of performing the ND affects the comprehensive assessment for the practical class
SA5 MSA 5 Final control of the 1st semester: credit	Compilation of the summary semester control of the 1st semester. Before the calculation are allowed acquirers who successfully mastered the material from disciplines, made practical skills and final computer testing.	According to the schedule	The applicant can receive 80 points for the credit. The minimum number of points a student must receive is 48 points

Form of assessment:

	Points	Minimum points	Можливість перескладання з метою підвищення оцінки
5 semester	**200 scores**		
SA2. Final testing	**20**		
	20	12	No
SA3. Examinetion of performance of practical skills	**20**		
	20	12	No
SA4. Current examination of the level of theoretical and practical training	**80**		
	80	Не передбачено	No
SA5. MSA 5 Final control of the 1st semester: credit	**80**		
	80	48	No
6 semester	**200 scores**		
SA1. Final control: exam	**80**		
Examination of theoretical knowledge for the academic year (2x20)	40	24	No
Final testing	20	12	No
Examination of practical skills	20	12	No
SA4. Current examination of the level of theoretical and practical training	**120**		
Examination of theoretical knowledge	80	48	No
Examination of practical skills	20	12	No
Final testing	20	12	No

When learning the module materials, the student is awarded a maximum of 5 points for each practical session (the grade is given in the traditional 4-point grading system). The maximum number of points for the student's current educational activity is 120 (survey on the topics of practical classes - 60 points, testing - 20 points, description of macropreparations - 20 points, description of micro preparations - 20 points). A student is admitted to the exam on the condition that he meets the requirements of the educational program and if he has scored at least 72 points for the current educational activity. The final module control is conducted according to the schedule at the end of the 5th semester. It includes a test of theoretical knowledge for the semester - 40 points, a test of practical skills - 20 points, and basic test questions "Step 1" - 20 points. The practice-oriented exam is held according to the schedule at the end of the 6th semester. Examination tickets contain two theoretical questions on a variety of subjects covering all sections of the academic discipline (20 points each), a test of practical skills (20 points), and basic test questions "Step 1" from the discipline (20 points). The exam is credited to the student if he scores at least 48 points out of 80. Encouraging points are added to the grade in the discipline for implementing an

individual research project (defense of a student thesis 12 points, speech at a conference 5 points, poster presentation at a meeting 4 points, views of reports 3 points). The total score for the discipline cannot exceed 200 points.

11. Learning resources

11.1 Material and technical support

MTS1	Information and communication systems
MTS2	Library funds
MTS3	Medical buildings/premises and equipment (section halls of the Sumy Regional Clinical Hospital, premises for intravital research of postoperative material, macropreparations of internal samples organs, histological preparations, etc.)
MTS4	Multimedia, video and sound reproduction, projection equipment (video cameras, projectors, screens, smart boards, etc.)
MTS5	Laboratory equipment (microscopes, apparatus for automated sample staining, microtomes, medical equipment, etc.)
MTS6	Computers, computer systems and networks
MTS7	Software (to support distance learning: designer of educational materials "Lectur.ED", educational platform "MIX")
MTS8	KNE SRC "Sumy Regional Clinical Hospital"

11.2 Information and methodical support

Essential Reading	
1	Fundamentals of Robinson's pathology: in 2 vols. Vol.1/ Viney Kumar, Abul K. Abbas, John K. Aster.;Scientific Translation by prof. I. Sorokina, S. Hychka, I. Davydenko. – K.: VSV "Medicine", 2019. - XII, 420 p.
2	Fundamentals of Robinson's pathology: in 2 vols. Vol.2/ Viney Kumar, Abul K. Abbas, John K. Aster.;Scientific Translation by prof. I. Sorokina, S. Hychka, I. Davydenko. – K.: VSV "Medicine", 2020. - XII, 532 p.
3	Bodnar Ya., Romaniuk A., Voloshyn V., Gargin V. Essentials of pathology. / Ya. Bodnar, A. Romaniuk, V. Voloshyn, V. Gargin. – Kharkiv: Planeta-Print, 2020. – 216 p.
4	Device for histological and histochemical staining of samples. Patent 144872 U Ukraine, IPC G01N 1/30 (2006.01) G01N 1/31 (2006.01). [Text] / YV Kuzenko, AM Romaniuk, MS Skidanenko and others; applicant and patent owner of SSU. - № u202003
5	Hyriavenko N, Lyndin M, Sikora K, Piddubnyi A, Karpenko L, Kravtsova O, Hyriavenko D, Diachenko O, Sikora V, Romaniuk A. Serous Adenocarcinoma of Fallopian Tubes: Histological and Immunohistochemical Aspects. J Pathol Transl Med. 2019;53: 236–43.
Supplemental Reading	

1	Pathomorphology [Текст] : textbook / I. V. Sorokina, V. D. Markovskyi, D. I. Halata et al. — 2nd. ed. — Kyiv : Medicine Publishing, 2020. — 328 p.
2	Pathological biomineralization of soft tissue [Текст] : monograph / R. A. Moskalenko, A. M. Romaniuk. — Sumy : Sumy State University, 2020. — 127 p.
3	Lyndin M, Gluschenko N, Sikora V, Lyndina Yu, Hyryavenko N, Tkach G, Kurochkina V, Romaniuk A. Morphofunctional features of articular cartilage structure. Folia Medica Cracoviensia. 2019;59(3):81–93.

	UNIVERISTY POLICIES FOR THE COURSE «Pathomorphology» **Higher education level** The Second Level Of Higher Education, National Qualifications Framework Of Ukraine – The 7th Level, QF-LLL – The 7th Level, FQ-EHEA – The Second Cycle **Major: Educational programme** 222 Medicine: Medicine **Year of study** 2023 **Semester** 5, 6 semester **Mode of study** full-time course **Language of instruction** English
Teacher(s)	Hyriavenko Nataliia Ivanivna, Moskalenko Roman Andriiovych
Contact	Candidate of Medical Science Hyriavenko Nataliia, e-mail: n.gyryavenko@med.sumdu.edu.ua
Time and room for giving consultations	Department of Pathological Anatomy, room M-414, Monday 16.00-18.00
Links to online educational platforms	https://meet.google.com/nsn-fijc-dir
Syllabus	https://pg.cabinet.sumdu.edu.ua/report/syllabus/2d0009efbb57017215499d1f6523161c3678018
Channels for maintaining contact with the group for receiving and working on materials	Personal account, e-mail, Viber, Telegram, Messenger, WhatsApp

POLICIES

Academic integrity policy

Participants must complete all tasks according to the course requirements independently. Participants are not allowed to cheat during the written module or summative test. The assignments should not contain plagiarism, facts of fabrication, falsification, cheating. Manifestations of other types of academic dishonesty determined by the Academic Integrity policy are also unacceptable. If a teacher reveals violations of academic integrity by students during the course, the former have the right to take one of the following actions: - to reduce points by up to 40% for practical assignments; - to give recommendations for improving and resubmitting mandatory homework assignments with the reduction of points by up to 25%; - to not accept mandatory homework assignments without the right to resubmit; - set a date for retaking the written module or the summative test with a reduction of points by up to 15%; - to not allow to retake the written module or the summative test.

Політика щодо використання інструментів штучного інтелекту при виконанні завдань навчальної дисципліни

Політика використання інструментів штучного інтелекту (ChatGPT, Tome тощо) оголошується викладачем на початку курсу.

Політика використання інструментів штучного інтелекту (ChatGPT, Tome тощо) оголошується викладачем на початку курсу.

Несанкціоноване використання інструментів штучного інтелекту є порушенням академічної доброчесності.

Політика щодо використання матеріалів з джерел відкритого доступу

При використанні здобувачами освіти матеріалів з джерел відкритого доступу для підготовки робіт, визначених силабусом та регламентом навчальної дисципліни, вони обов'язково мають дотримуватись умов ліцензій Creative Commons на використання об'єктів авторського права.

Attendance policy

The student must attend 100% of practical and 60% of lectures. In case of skipping classes, the student must work off the missed class in accordance with the schedule of work, approved by the department in the presence of the relevant order of the dean's office approved at the department in the presence of the relevant order of the dean's office.

Deadlines and course retake policy

In case of unsatisfactory result, the student has the right to retake the semester exam twice - the first time to the examiner appointed by the head of the department, the second - to the commission created by the dean's office. The re-examination is carried out according to a separate schedule, which is approved by the dean's office. Students who fail the exam without good reason are considered to have received an unsatisfactory grade. The student's refusal to perform the examination task is certified as an unsatisfactory answer. The student has the right to receive an explanation of the grade obtained.

Assessment appeals policy

The results of the module and semester assessment are subject to appeal. A student must lodge an appeal to the director/dean on the day of certification or after announcing the results, but no later than the next working day. The appeal commission is established by the director/dean’s order. The appeal commission's decision may change the grade in case of violations revealed during the attestation.

Assessment criteria

Assessment policy

When learning the module materials, the student is awarded a maximum of 5 points for each practical session (the grade is given in the traditional 4-point grading system). The maximum number of points for the student's current educational activity is 120 (survey on the topics of practical classes - 60 points, testing - 20 points, description of macropreparations - 20 points, description of micro preparations - 20 points). A student is admitted to the exam on the condition that he meets the requirements of the educational program and if he has scored at least 72 points for the current educational activity. The final module control is conducted according to the schedule at the end of the 5th semester. It includes a test of theoretical knowledge for the semester - 40 points, a test of practical skills - 20 points, and basic test questions "Step 1" - 20 points. The practice-oriented exam is held according to the schedule at the end of the 6th semester. Examination tickets contain two theoretical questions on a variety of subjects covering all sections of the academic discipline (20 points each), a test of practical skills (20 points), and basic test questions "Step 1" from the discipline (20 points). The exam is credited to the student if he scores at least 48 points out of 80. Encouraging points are added to the grade in the discipline for implementing an individual research project (defense of a student thesis 12 points, speech at a conference 5 points, poster presentation at a meeting 4 points, views of reports 3 points). The total score for the discipline cannot exceed 200 points.

Alignment of learning outcomes with teaching and learning activities and assessment

For 222 Medicine:

Competences/ learning outcomes	Learning outcomes	Types of training	Learning activities	Teaching methods	Material and technical support	Methods and criteria for assessment
PO5	LO1	lect.1-lect.3, pr.tr.1-pr.tr.45	LA2, LA6, LA7, LA10, LA8, LA11, LA3, LA4, LA5, LA1, LA9	TM1, TM2, TM3, TM4, TM5, TM6, TM7	MTS2, MTS3, MTS4, MTS5, MTS6, MTS7, MTS8	SA3, SA2, SA5, SA4, SA1
PO6	LO2	lect.1-lect.3, pr.tr.1-pr.tr.45	LA2, LA6, LA7, LA10, LA8, LA11, LA3, LA4, LA5, LA1, LA9	TM1, TM2, TM3, TM4, TM5, TM6, TM7	MTS1, MTS2, MTS4, MTS6, MTS7	SA3, SA2, SA5, SA4, SA1
PO7	LO3	lect.1-lect.3, pr.tr.1-pr.tr.45	LA2, LA6, LA7, LA10, LA8, LA11, LA3, LA4, LA5, LA1, LA9	TM1, TM2, TM3, TM4, TM5, TM6, TM7	MTS1, MTS2, MTS4, MTS6, MTS7	SA3, SA2, SA5, SA4, SA1
PO21	LO4	lect.1-lect.3, pr.tr.1-pr.tr.45	LA8, LA11, LA1, LA9	TM5, TM7	MTS1, MTS3, MTS4, MTS5, MTS8	SA3, SA1