TARAS SHEVCHENKO NATIONAL UNIVERSITY OF KYIV
ESC «INSTITUTE OF BIOLOGY AND MEDICINE»

DEPARTMENT OF PHYSIOLOGY AND ANATOMY

«APPROVED»
Deputy director for scientific and pedagogical work (department of medicine)
_____ Olga KHARCHENKO
«29» 06 2026

WORKING PROGRAM ON THE DISCIPLINE

PATHOPHYSIOLOGY

for higher education applicants

branch of knowledge	22 «Healthcare»
specialty	222 «Medicine»
educational level	«Master»
educational program	«Medicine»
type of discipline	obligatory

Form of studying	day study
Educational year	2026/2027
Terms	5, 6
Credits ECTS	7
Language of teaching, learning and evaluation of knowledge	English
Final control	5-term – exam 6-term – exam

Teachers: **Kovalchuk O.I.**, Doctor of Medical Sciences, MD, Professor

KYIV-2026

Developer:
HOD, Professor, Doctor of Medical Sciences Oleksandr KOVALCHUK

"I AGREE"
Head of the Department of Physiology and Anatomy
_____ (Oleksandr KOVALCHUK)
(signature)
Protocol № 20 03 06 2026

Approved by scientific and methodical commission
ESC "Institute of Biology and Medicine"
Taras Shevchenko National University of Kyiv

Protocol «9» 23.06 2026 year №___
Head of scientific and methodical commission _____(Tetiana SHEVCHENKO)
«29» 06 2026 year

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ESC «INSTITUTE OF BIOLOGY AND MEDICINE»

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Protocol «____» _____ 20___ year №___

Head of scientific and methodical commission _____(Tetiana SHEVCHENKO)
«_____» _____ 20___ year

1. The aim of the discipline - To study the general patterns and specific mechanisms, development, course and outcomes of diseases, individual diseases and pathological conditions.

2. Prerequisites for mastering or choosing a discipline:

1. Thorough knowledge of the macroscopic and microstructural organization of the human body, the patterns of embryonic development, as well as the general biological and molecular mechanisms of cell life. Understanding of physicochemical, bioorganic and biophysical processes in living systems, the functioning of organs and systems of the body, as well as the biological properties of infectious agents and the principles of immune defense.

2. Ability to independently apply knowledge of human anatomy, histology, physiology, medical biology and other disciplines to solve specific scientific and practical problems; skills in working with scientific and scientific and methodological literature.

3. Possession of elementary skills of systems analysis.

4. Abstract:

The subject "Pathological physiology " is part of the cycle for training specialists at "Master" and "Medicine" educational levels. Pathophysiology is a mandatory discipline that studies the general patterns and mechanisms diseases at the cellular, organ, system levels and the body as a whole; mechanisms of resistance, the origin and course of the disease and its consequences, as well as recovery. Pathophysiology as an academic discipline forms the methodological foundations of clinical thinking; provides an opportunity to conduct pathophysiological analysis of clinical situations for further diagnosis, treatment, prevention of diseases.
For the educational component, a level 2 use of generative artificial intelligence is generally established in accordance with the "Regulations on the use of artificial intelligence in the implementation of educational programs at Taras Shevchenko National University of Kyiv". For certain types of assessed work, special restrictions are defined in clause 7.1 of the work program, in particular, a complete ban on the use of generative AI during control measures performed under the supervision of a teacher.

4. Learning objectives:

1. to form a clear idea of the general nosology: health, disease, pathological process, typical pathological process, pathological reaction, pathological condition, etiology, pathogenesis;
2. to form a clear idea of typical pathological processes, typical metabolic disorders and individual diseases according to the principles of their classification, stages of pathogenesis, general manifestations and variants of completion;
3. to form skills to analyze various options for the development of certain relationships in the pathogenesis of diseases;
4. to form methodological bases of clinical thinking;
5. to form a clear idea of the main promising areas in pathophysiology and general pathology.

According to the requirements of the Higher Education Standard of Ukraine (the second (Master's) level of higher education (NQF of Ukraine – Level 7), field of study 22 Healthcare, specialty 222 Medicine, approved and put into effect by the Order of the Ministry of Education and Science of Ukraine dated November 8, 2021, No. 1197), the course "Pathophysiology" ensures the acquisition of the following competencies*:*

integral

-ability to solve typical and complex specialized tasks, practical problems in professional activities in the field of health care, or in the learning process, which involves research and/or innovation and is characterized by complexity and uncertainty of conditions and requirements.

general:

- the ability to apply knowledge in practical situations;
- knowledge and understanding of the subject area and profession;
- the ability to exercise self-control, lead a healthy lifestyle, ability to adapt;
- the ability to choose a communication strategy; ability to work in a team; interpersonal skills;
- the ability to communicate in the native language both orally and in writing; ability to communicate in a second language;
- the skills of using information and communication technologies;
- the ability to abstract thinking, analysis and synthesis, ability to learn and be modemly trained;
- the ability to apply knowledge in practical situations;
- the ability to evaluate and ensure the quality of work performed;
- the certainty and persistence in terms of tasks and responsibilities;
- the desire to preserve the environment.

specific (professional, subjects):

- the ability to process state, social, economic and medical information.

5. Learning outcomes

5 Semesters

Learning outcome (1 - knowledge; 2 - skill; 3 - communication; 4 - independence and responsibility)		**Forms (and / or methods and technologies) of teaching and learning.**	**Evaluation methods**	**The percentage of final assessment on discipline.**
Code	**Learning outcome**			
1				
1.1. ~	To know			
	Basic concepts of general nosology: health, disease, pathological process, pathological reaction, pathological condition, etiology, pathogenesis.	Lecture, Practical lesson	Final module tests, Module control work № 1,2, evaluation of practical work, presentations / reports.	**10**
1.2.	Causes and mechanisms of development of disease processes, their manifestations and significance, for the human organism, particularly in the origin and development of the group of diseases.	Lecture, Practical lesson Independent work	Final module tests, Module control work №1,2, evaluation of practical work, presentations / reports.	**10**
1.3.	Cause and effect in the pathogenesis of diseases (changes in local and general, pathological and adaptive-compensatory,	Lecture, Practical lessons,	Final module tests. Module control work №1,2,	**10**

	specific and non-specific, main and associated).	Independent work.	evaluation of practical work, presentations / reports.	
1.4.	Causes, mechanisms of development and principles of treatment of pathological processes and typical metabolic disorders.	Lecture, Practical lessons, Independent work	Final module tests, Module control work № 1,2, evaluation of practical work, presentations / reports.	10
1.5.	Application of the knowledge of pathophysiology to analyze and assess the state of the organism, disorders of organs and systems in order to further plan diagnostic methods, treatment and prophylactic measures.	Lecture, Practical lessons, Independent work	Final module tests, Module control work №1,2, evaluation of practical work, presentations / reports.	10
1.6	Standard methods, including modem computer information technology in processing of state, social and medical information.	Lecture, Practical lessons, Independent work	Final module tests, Module control work № 1,2, evaluation of practical work, presentations / reports.	10
2	To be able			
2.1.	Solving situational tasks by identifying causative factors, risk factors, the main link of pathogenesis, stages of development, mechanisms of clinical manifestations, completion options, principles of medical care for typical pathological processes and the most common diseases. Care for typical pathological processes and the most common diseases.	Lecture, Practical lessons, Independent work	Final module tests, Module control work № 1,2, evaluation of practical work, presentations / reports.	10
2.2.	Evaluation of the state of organs and systems in diseases using laboratory results and instrumental studies.	Practical lessons	Final module tests, Module control work № 1,2, evaluation of practical work, presentations / reports.	5
2.3.	To identify and record the leading typical pathological process, its main link and clinical signs.	Lecture Practical lessons	Final module tests, Module control work № 1,2, evaluation of practical work, presentations / reports.	5
2.4.	Determination of the principles of disease treatment.	Lecture Practical lessons	Final module tests, Module control work № 1,2,	5

			evaluation of practical work, presentations / reports.	
2.5.	Carry out statistical processing of the material and analysis of the received information.	Practical lesson	Final module tests, Module control work №1,2, evaluation of practical work, presentations / reports.	5
9	Communication			
3.1	Presentation of the results of scientific research in the form of reports using modern technologies, correct conduct of the discussion.	Practical lesson	Evaluation of practical work, presentations / reports	5
4	Responsibility			
4.1.	Understanding the fundamental issues of pathophysiology, conduct selection and analysis of contemporary literature in this area, use it, as well as data processing programs for planning, obtaining and analyzing the results of research.	Independent work	Evaluation of the presentation / report	5

Semester 6

Learning outcome (1 - knowledge; 2 - skill; 3 - communication; 4 - independence and responsibility)		**Forms (and / or methods and technologies) of teaching and learning.**	**Evaluation methods**	**The percentage of final assessment on discipline.**
Code	**Learning outcome**			
1	To know			
1.1.	Disorders of peripheral blood cell, anemia, polycythemia, leukocytosis, leukopenia, leukemia; hemostasis disorders.	Lecture, Practical lessons, Independent work	Final module tests, Module control work № 1,2, evaluation of practical work, presentations / reports.	5
1.2.	Causes and mechanisms of the development of circulatory system disorders circulatory failure; heart failure, arrhythmias, hypertension and hypotension; arteriosclerosis, atherosclerosis. Causes and mechanisms of coronary insufficiency, complications, consequences.	Lecture, Independent work	Final module tests, Module control work № **1,2,** evaluation of practical work, presentations / reports.	5
1.3.	Causes and mechanisms of the development of disorders of the respiratory system: insufficiency of external respiration, disorders of ventilation of the alveoli, diffusion of gases through the alveolar-capillary membrane, perfusion; causes and	Lecture, Practical lessons, Independent work	Final module tests, Module control work №1,2, evaluation of practical work, presentations /	5

	mechanisms of shortness of breath, the development of asthma.		reports.	
1.4.	indigestion and malabsorption, peptic ulcer of the stomach and duodenum. The etiology, pathogenesis, clinical manifestations of liver failure, hepatic coma, jaundice, portal hypertension. Principles of their prevention and treatment. Causes and mechanisms of renal disorders in acute and chronic renal failure, glomerulonephritis, nephrotic syndrome, urinary syndrome, uremic coma	Lecture, Practical lessons, Independent work	Final module tests, Module control work №1,2, evaluation of practical work, presentations / reports.	5
1.5.	Causes and general mechanisms of development of disorders of endocrine glands, primary and secondary endocrinopathies, consequences of disorders of secretion of hormones of adenohypophysis, neurohypophysis, adrenal glands, thyroid gland, gonads; general biological role of stress, typical disorders of the nervous system: sensory functions, motor function, autonomic function, trophic function and integrative function; the role of acute and chronic disorders of cerebral circulation in disorders of the brain and the body as a whole.	Lecture, Practical lessons, Independent work	Final module tests, Module control work № 1,2, evaluation of practical work, presentations / reports.	5
1.6	Mechanisms of pathogenesis and clinical manifestations in common diseases of systems and organs	Lecture, Independent work	Final module tests, Module control work № 1,2, evaluation of practical work, presentations / reports.	5
	To be able			
2.1.	Solving situational tasks by the determining the causative factors, risk factors, the main link of pathogenesis, stages of development, mechanisms of clinical manifestations, end results, principles of medical care for the most common diseases.	Lecture, Independent work	Final module tests, Module control work №1,2, evaluation of practical work, presentations / reports.	5
2.2. “	Assessment of the functional state of organs and systems on the basis of laboratory results and instrumental studies.	Practical lesson.	Final module tests. Module control work № 1,2, evaluation of practical work, presentations / reports.	5
2.3.	Identification and recording of the etiology, pathogenesis, clinical manifestations of common diseases of systems and organs. Determination of the principles of disease treatment	Lecture, Practical lesson.	Final module tests, Module control work № 1,2, evaluation of practical work, presentations / reports.	5

2.4.	Carry out statistical processing of the material and analysis of the received information.	Practical lesson	Final module tests, Module control work № 1,2, evaluation of practical work, presentations / reports.	5
o	Communication			
3.1	Presentation of the results of scientific research in the form of reports using modem technologies, correct conduct of the discussion.	Practical lesson	Evaluation of practical work and classes, presentations / reports	5
4	Responsibilities			
4.1.	Understanding the fundamental issues of pathophysiology, conduct selection and analysis of contemporary literature in this area, use it, as well as data processing programs for planning, obtaining and analyzing the results of research.	Independent work	Evaluation of the presentation / report	5

6. Correlation of learning outcomes of the discipline with program learning outcomes

Learning outcomes Disciplines (code) **Program results training (name)**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**	**3.1**	**4.1**
The application of knowledge to analyze and assess the state of the organism, disorders of organs and systems in order to further plan diagnostic tests, treatment and prevention measures.	+	+	+	+	+	+	+			+			+
Hvaluating information about the diagnosis, using a standard procedure (based on the laboratory results and instrumental studies, etc.) and orally (in the form of reports and defense) using modern technology, correctly conducting discussions/presentations.	+					+		+		+		+	+
Knowledge and understanding of the subject area and profession.	+	+			+	+	+			+	+		
Combining the achievements of clinical research and modem experimental approaches in solving current problems of etiology and pathogenesis of diseases	+		+				+						
Analyzing the relationships in pathogenesis	+	+	+								+		
Application of knowledge about "pathological" and "compensatory-protective" mechanisms in pathogenesis, the leading and associated processes in the diagnosis and treatment of diseases.	+	+	+				+		+				
Processing state, social, economic and medical information.						+					+		

7. [.valuation scheme.

7.1 **Forms of student assessment:**

Semester 5

-Semester assessment:

1. Module test 1 - LO 1.1, 1.5, 1.6, 2.1, (block of topics of Section 1) - 15 points / 7.5 points
The use of generative artificial intelligence is not permitted.
2. Module control work 2 - LO 1.2 - 1.6, 2.2 - 2.4. (block of topics of Section 1) - 15 points / 7.5 points
The use of generative artificial intelligence is not permitted.
3. Final module control work - LO 1.1 - 4.1. (Block of topics of Section 1) - 30 points /15 points
The use of generative artificial intelligence is not permitted.
4. Registration of results of practical works (the decision of situational problems and working off of practical skills) - LO 1.1 - 2.6, 4.1.-10 points / 5 points
5. Presentations / reports - LO 1.1. - 3.1., 4.1 - 10 points / 5 points
6. Evaluation of practical classes - LO 1.1. - 3.1., 4.1-20 points /10 points

-Final assessment: in the form of a test:

The final grade for the educational component, the final form of control for which the test is set, is defined as the sum of grades (points) for all successfully assessed learning outcomes. Scores below the lowest possible score are not added to the final score.

It is obligatory to get a positive final grade (60 points and above and "passed") to practice all practical classes.

Retake of semester control test in order to improve the positive assessment is not allowed.

The use of generative artificial intelligence is not permitted.

7.2. Organization of evaluation:

Module tests 1, 2 and the final module test are conducted after the thematic lectures on Section 1 and practical classes.

Assessment of solving situational tasks and practical skills is carried out during thematic practical classes.

Assessment of practical classes is conducted during the semester during the practical classes.

Passed/Зараховано	60-100
Fail /Не зараховано	0-59

7. Forms of student assessment:

Semester 6

- semester assessment:

1. Module test 1 - LO 1.1, 1.5, 1.6, 2.1, (block of topics of Section 1) - 10 points / 5 points
The use of generative artificial intelligence is not permitted.
2. Module control work 2 - LO 1.2 - 1.6, 2.2 - 2.4. (block of topics of Section 1) - 10 points / 5 points
The use of generative artificial intelligence is not permitted.
3. Final module control work - LO 1.1 - 4.1. (Block of topics of Section 1) - 10 points / 5 points
The use of generative artificial intelligence is not permitted.
4. Registration of results of practical works (the decision of situational problems and working off of practical skills) - LO 1.1 - 2.6, **4.1** — 10 points / 5 points
5. Presentations / reports - LO 1.1. - 3.1., 4.1 - 10 points / 5 points
6. Evaluation of practical classes - LO 1.1. - 3.1., 4.1- 10 points / 5 points **-Final assessment: in the form of a test**

The final grade for the educational component, the final form of control for which the test is set, is defined as the sum of grades (points) for all successfully assessed learning outcomes. Scores below the lowest possible score are not added to the final score.

The form of the exam is a test. The learning outcomes that are evaluated in the test are LO 1.1-4.1. The maximum number of points that can be obtained by the student during the exam is 40 points on a 100-point scale.

Retaking of semester control test in order to improve the positive assessment is not allowed.

The use of generative artificial intelligence is not permitted.

- conditions of admission to the final exam:

The obligatory condition for admission to the exam is to practice all practical works, write 4 module tests and 2 final module tests, prepare a presentation / report. An applicant is not allowed to take the exam if he / she scored less than 20 points during the semester.

7.2 **Organization of evaluation:**

7.3 Rating scale

Excellent	90-100
Good	75-89
Satisfactory	60-74
Fail	0-59

8. The structure of the discipline. Thematic plan.

№	Name of the topic	Number of hours			
		Lectures	Practical training	Consultations	Individual work*
Term 5					
1.	**LECTURE 1.** INTRODUCTION TO PATHOPHYSIOLOGY. ETIOLOGY AND PATHOGENESIS. THE ROLE OF ORGANISM REACTIVITY IN THE DEVELOPMENT OF PATHOLOGY.	2			
2.	**Practical lesson 1.** Subject and method of pathophysiology. Influence of thermal and barofactors on an organism.		2		
3.	**Individual work 1.** The main directions of the doctrine of the disease: humoral (Hippocrates), solidarity (Democritus), cellular (R. Virkhov). Development of directions at the present stage. Causation, their variants and "circulus vitiosus". The concept of the main link of pathogenesis.				3
4.	**Practical lesson 2.** Pathogenic effect of ionizing radiation.		2		
5.	**Individual work 2.** Pathogenic effect of environmental factors: increased and decreased barometric pressure, chemical, biological, mental and social factors). Pathogenic action of thermal factors. Heat and sunstroke. Artificial hypothermia, its use in medicine. Local manifestations - bums, frostbite. Pathogenic effect of electric current.				3
6.	**Practical lesson 3.** Pathology of reactivity. The role of heredity and age changes in pathology.		2		
7.	**Individual work 3.** Aging. General signs and patterns of aging. Structural, functional and biochemical manifestations of aging at the molecular, cellular, tissue, organ levels and at the level of the whole organism. Theories of aging. Progeria. Methods of geroprotection.				3
8.	**LECTURE 2.** CELL PATHOLOGY. TYPES OF CELL DEATH.	2			
9.	**Practical lesson 4.** Pathophysiology of the cell. General mechanisms of cell damage and death. Necrosis, apoptosis and autophagy.		2		
10.	**Individual work 4.** Information mechanisms of cell damage. Alarm pathology, signal reception. The phenomenon of molecular mimicry. Disorders of signal transduction mechanisms, violation of secondary messengers. Defects of cellular programs as a basis for the development of pathological processes. Disruption of cell energy supply. Disorders of nutrient transport across cell membranes, disorders of intracellular catabolic pathways. Disorders of cellular respiration, the effect of separation of oxidation and phosphorylation, its mechanisms.		1		4
11.	**LECTURE 3.** VIOLATION OF IMMUNITY. ALLERGY.	2			
12.	**Practical lesson 5.** Disorders of the immune system. Lack of immunity.		2		
13.	**Individual work 5.** Pathophysiological bases of organ and tissue transplantation. Graft rejection reaction: causes, mechanisms. Graft versus host reaction. Immunological relationships in the "mother-fetus" system.				3

14.	Practical lesson 6. **Allergy.**		2		
15.	**Individual work** 6. Basis of ASIT-Therapy				3
16.	**LECTURE** 4. GENERAL CHARACTERISTICS OF TYPICAL PATHOLOGICAL PROCESSES. INFLAMMATION.	2			
17.	**Practical lesson 7.** Inflammation. Stages of alteration and exudation in		2		
18.	**Individual work 7.** Inflammation. Stages of alteration and exudation in inflammation.				3
19.	**Practical lesson 8.** Inflammation. Stage of proliferation		2		
20.	**Individual work 8.** General changes in the body during inflammation.				3
21.	**Practical lesson 9.** Disorders of peripheral blood circulation and microcirculation. Hypoxia. Fever.		2		
22.	Individual work 9. **The role of HIF in the development of pathological conditions. Fever of unclear origin.**				3
23.	**LECTURE 5.** FEATURES OF TUMOR GROWTH. EFFECT OF XENOBIOTICS ON THE HUMAN BODY.	2			
24.	**Practice session 10.** Features of tumor growth. Etiology, pathogenesis of tumors.		2		
25.	**Individual work 10.** Features of tumor screening. Immunological prevention of tumors				3
26.	**Practice session 11** Molecular mechanisms of tumor progression and metastasis.		2		
27.	**Individual work 11.** Molecular mechanisms of tumor progression and metastasis.				3
28.	**LECTURE** 6. DISORDERS OF CARBOHYDRATE METABOLISM. DISORDERS OF PROTEIN AND FAT METABOLISM.	2			
29.	**Practice session 12.** Disorders of carbohydrate metabolism. Diabetes.		2		
30.	**Individual work 12.** Disorders of carbohydrate absorption, processes of synthesis, deposition and breakdown of glycogen, transport of				3
31.	**Practical lesson 13.** Disorders of amino acid metabolism. Violation of the protein composition of the blood. Disorders of lipid transport in the		2		
32.	**Individual work 13.** Impaired transport function of blood plasma proteins. Conformational changes of proteins molecules, disorders of protein degradation in lysosomes and proteasomes, their role in				3
33.	**LECTURES 7.** DISORDERS OF WATER-ELECTROLYTE EXCHANGE. VIOLATION OF ACID-ALKALINE BALANCE.	2			
34.	**Practical lesson 14.** Violation of water-electrolyte metabolism. Violation of acid-base balance.		2		
35.	**Independent work 14.** Features of disorders of water-electrolyte metabolism in infectious diseases. Correction and maintenance of acid-base imbalances.				4
36.	**Practical lesson 15.** Generalization of material and modular control work "General pathology. Typical pathological processes".		2		
	Total:	**14**	**30**	**0**	**46**

Total number of hours for semester 5 - ***90 hours, consisting of the following:***

Lectures ***-14 hours***

Practical lessons - ***30 hours.***

Individual work - ***46 hours.***

		Number of hours			
№	Name of topics	Lectures	Practical lessons	Consultations	Individual work
	Term 6				
37.	**LECTURE** 8. PATHOLOGY OF ERYTHROCYTES. PATHOLOGY OF LEUKOCYTES. PATHOLOGY OF HEMOSTASIS.	2			
38.	**Practical lesson 16.** Violation of the total blood volume. Posthemorrhagic anemia.		2		
	Practical lesson 17. Hemolytic and dyserythropoietic anemias.		2		
39.	**Practical lesson 18.** Leukocytosis. Leukopenia. Leukemia		2		
40.	**Independent work 15.** Features of blood transfusion. Blood transfusion and post hemotransfusion reactions: mechanisms of development and means of prevention				4
41.	**Practical lesson 19.** Pathology of platelet-vascular and coagulation hemostasis.		2		
42.	**Independent work 16.** Leukemoid reaction, Leukemia myeloid and 'lymphoid. Analysis of blood smears of patients with leukemia. The course of leukemia in children and the elderly.				6
43.	**Independent work 17.** Methods for determining pathological changes in the hemostasis system: Features of coagulogram and thromboelastogram. Pathogenesis of hemorrhagic shock. DIC syndrome.				6
44.	**LECTURE** 9. INSUFFICIENCY OF SYSTEMIC CIRCULATION. HEART FAILURE CORONARY INSUFFICIENCY. ARRHYTHMIA.	2			
45.	**Practical lesson 20.** Pathophysiology of heart failure.		2		
46.	**Independent work 18.** Etiology and pathogenesis of myocarditis, cardiomyopathies and myocardial infarction.				6
47.	**Practical lesson 21.** Pathophysiology of coronary insufficiency.		2		
	Practical lesson 22. Vascular pathology. Atherosclerosis. Hypertension.		2		
48.	**Independent work 19.** ECG analysis of patients with various cardiac arrhythmias. Features of an ECG at a myocardial infarction. Hypotension. Aneurysms				4
49.	**LECTURE 10.** PATHOLOGY OF THE RESPIRATORY SYSTEM.	2			
50.	**Practical lesson 23.** Pathophysiology of respiratory failure.		2		
51.	**Independent work 20.** Spirogram indicators of obstruction and restriction. Features of diffusion and perfusion processes. Pathogenesis of respiratory distress syndrome in newborns and adults. Occupational lung diseases (pneumoconiosis, asbestosis, silicosis) Cystic fibrosis. Ephysema. Sleep apnea syndrome.				6
52.	**LECTURE 11.** PATHOLOGY OF THE DIGESTIVE SYSTEM. PATHOLOGY OF PANCREAS AND LIVER.	2			

53.	**Practical lesson 24.** Pathophysiology of digestion.		2		
	Practical lesson 25. Etiology and pathogenesis of acute and chronic pancreatitis.		2		
	Practical lesson 26. Liver failure.		2		
54.	**Independent work 21.** Esophageal dysfunction. Etiology and pathogenesis of gastritis. Intestinal irritation syndrome, Crohn's disease. Pathogenesis of mechanical and dynamic intestinal obstruction Tumors of the digestive system. Hereditary jaundice (Gilbert's disease, Rotor, Kriegler-Najar, Dubin-Johnson). Portal hypertension. Cirrhosis. Alcoholic liver cirrhosis.				6
55.	**LECTURE 12.** PATHOLOGY OF THE URINARY SYSTEM AND GENITAL SYSTEM	2			
56.	**Practical lesson 27.** Renal pathology. Renal failure. Urolithiasis.		2		
	Practical lesson 28. Polycystic kidney disease. Kidney tumors, features of pathogenesis.		2		
57.	**Independent work 22.** Mechanisms of kidney stone formation. The concept of extracorporeal and peritoneal hemodialysis, lymphodialysis and hemosorption.				6
58.	**Practical lesson 29.** Generalization of material and module control work **1** "Disorders of blood, cardiovascular, respiratory, urinary and digestive systems".		2		
59.	**LECTURE 13.** PATHOPHYSIOLOGY OF ENDOCRINE ORGANS	2			
60.	**Practical lesson 30.** Pathology of the hypothalamus, pituitary gland.		2		
	Practical lesson 31. Pathology of the thyroid and thyroid glands.		2		
	Practical lesson 32. Pathology of the adrenal and gonads.		2		
61.	**Independent work 23.** General adaptation syndrome. Pathogenesis. Stages. Insufficiency of adrenal cortex hormones (Addison's disease).				6
62.”	**Practical lesson 33.** Etiology and pathogenesis of diseases of the female reproductive systems		2		
63.	**Practical lesson 34.** Etiology and pathogenesis of diseases of the male reproductive systems		2		
	Independent work 24. Endometriosis, fibromyoma, endometritis, adnexitis. Prostatitis, prostate cancer.				6
64.	**LECTURE 14.** PATHOPHYSIOLOGY OF THE NERVOUS SYSTEM AND EXTREME CONDITIONS.	2			
65.	**Practical lesson 35.** Dysfunction of the nervous system.		2		
66.	**Independent work 25.** Parkinsonism. Dementia. Neurogenic dystrophy. Multiple sclerosis.				4
67. ~	**Practical lesson 36.** Pathophysiology of extreme conditions.		2		
68.	**Practical lesson 37.** Generalization of material and final control work 2 "Disorders of endocrine, nervous systems and extreme conditions".		2		
69.	**Practical lesson 38**. Final modular control work 2. "Pathology of organs and systems".		2		
	Total:	**14**	**46**	0	**60**

Total number of hours for semester 6 **- *120 hours,*** *consisting of the following*;
Lectures **- *14 hours***
Practical lessons ***46 hours.***
Individual work- ***60 hours.***

The total amount of ***210 hours*****,** including:
Lectures **-** ***28 hours.***
Practical classes **- *76 hours.***
Individual work **- *106 hours.***

9. References

Main:

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