

**Academic programme
component**

**31.05.01 General Medicine
programme**

**Б1.0.28
discipline code**

SYLLABUS

Discipline Б1.0.28 Pathophysiology

Author(s):

Poludnyakova L.V.

Associate Professor

Ph.D. in Biological Sciences

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Clinical Medicine Department

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Head of the department Krivenko O.G.

signature

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Clarification

Discipline volume: 7 credit points

1. Discipline (module) training results correlated with the indicators of competencies achievement determined by the educational programme

Competency	Indicators of competency achievement	Discipline (module) training results
<p>ОПК-5 Can analyze morphofunctional and physiological indicators as well as pathological processes in human body to achieve professional goals</p>	<p>ИД-2 ОПК-5. Defines and analyzes morphological, functional, physiological states and pathological processes of the human body based on knowledge of biomolecules, subcellular cultures, their biochemical characteristics, metabolic pathways and regulatory principles</p> <p>ИД-4 ОПК-5. Determines and analyzes morphological, functional, physiological states and pathological processes of the human body based on knowledge about body systems, their functions, regulation of activity</p>	<p>To know:</p> <ul style="list-style-type: none"> - moral and ethical standards, rules and principles for organizing scientific research on humans and experimental animals; - basic patterns of development and vital activity of the body based on the structural organization of cells, tissues and organs; - anatomical-physiological, age-sex and individual structural features and the development of a healthy and sick organism; - functional systems of the human body, their regulation and self-regulation when interacting with the external environment in normal and pathological conditions; - basic physiological constants of the human body and their changes during pathological processes. <p>To be able to:</p> <ul style="list-style-type: none"> - make calculations based on research results, statistical processing of experimental data; - interpret the results of the most common functional diagnostic methods used to identify pathologies of the blood, heart and blood vessels, lungs, kidneys, liver and other organs, hematological parameters. <p>To have:</p> <ul style="list-style-type: none"> - skills of an integrated approach to assessing the functions of body systems in normal conditions and in pathology; - skills in using medical instruments (phonendoscope, neurological hammer, tonometer, electrocardiograph, etc.).

2. Discipline (module) contents

Unit 1. General pathophysiology

Topic 1. Introduction. Subject and tasks of pathophysiology. General nosology.

Definition of pathophysiology as a science. Methods of pathophysiology. Modeling as the main method of pathophysiology, its types, capabilities and limitations. Basic concepts of general nosology: norm, health, pathological process, pathological reaction, pathological condition, typical pathological process, disease, pre-disease. Disease. General etiology. General pathogenesis. Leading links of pathogenesis, "vicious circles". Sanogenesis, definition. Mechanisms of recovery. Terminal states.

Topic 2. Painful effects of environmental factors.

Effect of elevated temperatures. Overheating, causes, stages of development, compensation mechanisms. The difference between heatstroke and sunstroke. Effect of low temperatures. Hypothermia, causes, stages of development, compensation mechanisms. Application of hibernation in medicine. Damaging effects of ionizing radiation. General pathogenesis and effects on cells, local effects of ionizing radiation. Acute radiation sickness. Chronic radiation sickness. The effect of increased atmospheric pressure. Caisson disease. The effect of low atmospheric pressure, mountain sickness. The effect of acceleration on the body, kinetosis.

Topic 3. Cell damage.

Characteristics of the concept of "cell damage". Reversible and irreversible cell damage. Etiology of cell damage. Mechanisms of cell damage. Violations of the energy supply of the cell. Damage to cell membranes and enzymatic systems. Violation of the water-electrolyte composition of the cell, causes, development mechanisms, consequences. Violations of the genetic apparatus of the cell, causes, development mechanism, consequences. Disorders of regulation of cell activity. Typical forms of cell pathology: dystrophy, dysplasia, necrosis, pathological forms of apoptosis, disturbances in the structure and function of individual subcellular structures and components. Mechanisms that provide protection and adaptation of cells when damaged.

Topic 4. Reactivity and resistance of the body, their role in pathology.

Reactivity of the body, characteristics of the concept, classification. Forms of reactivity: normergy, hyperergy, hypoergy, dysergy, anergy. Resistance of the body, classification, examples, relationship between reactivity and resistance. The influence on the reactivity and resistance of the body of age, gender, type of constitution, metabolic characteristics, the state of the nervous, endocrine, immune and other body systems, as well as environmental factors.

Topic 5. Pathophysiology of peripheral circulation and microcirculation. Violations of the rheological properties of blood.

Arterial hyperemia: definition, types, mechanisms of development, manifestations, meaning. Ischemia. Causes and mechanisms of development. Symptoms and consequences of ischemia. Venous hyperemia, its causes. Symptoms and meaning of venous hyperemia. Stasis. Ischemic, congestive and "true" capillary stasis. Thrombosis, definition, causes and mechanisms of thrombus formation, types of blood clots. The meaning and consequences of thrombosis.

Embolism. Definition, types, development mechanisms, consequences. Typical forms of blood and lymph microcirculation disorders: intravascular, transmural, extravascular.

Topic 6. Colloquium on Topics 1–5

Topic 7. Pathophysiology of inflammation.

Inflammation, definition. Etiology of inflammation. The main components of the pathogenesis of the inflammatory process. Alteration, definition, types, meaning. Structural, metabolic and physicochemical changes in the focus of inflammation. Inflammatory mediators: their types, origin, main effects. Stages and mechanisms of microcirculation disturbance in the focus of inflammation. Exudation. Definition, development mechanisms, meaning. Types of exudates. Inflammatory edema, its pathogenetic links. Emigration of leukocytes, mechanisms. Phagocytosis: its types, stages and mechanisms. Proliferation, definition, mechanisms, stimulators and inhibitors of proliferation, significance. Local and general signs of inflammation. Types and forms of inflammation. Chronic inflammation. General patterns of development. Pathogenetic features of acute and chronic inflammation. Outcomes of inflammation. Biological significance of inflammation. Principles of anti-inflammatory therapy.

Topic 8. Pathophysiology of the acute phase response (APR). Fever. Hyper- and hypothermia.

Characteristics of the concept of “acute phase response”. The main mediators of the acute phase response (APR), their origin and biological effects. Manifestations of OOF, mechanisms of their development. The meaning of OOF. Characteristics of the concept of "fever". Etiology and pathogenesis of fever. Stages of fever. Thermoregulation and changes in body functions at different stages of fever. Types of febrile reactions. Biological significance of fever. Principles of antipyretic therapy. The concept of pyrotherapy. Differences between fever and exogenous overheating and other types of hyperthermia.

Topic 9. Pathophysiology of disorders of immune reactivity.

Typical forms of pathology of the IBN system. Immunodeficiency states (IDS), concept, classification. Primary immunodeficiencies, causes and mechanisms of development, manifestations. Combined immunodeficiencies: causes and mechanisms of development, manifestations. Secondary (acquired) immunodeficiency and immunosuppressive conditions, causes and mechanisms of development. Acquired immunodeficiency syndrome (AIDS): etiology, pathogenesis, clinical forms, principles of prevention and treatment. Allergy, definition. Allergens, classification. Types of allergic reactions. Sensitization. Stages of allergic reactions. Immediate type hypersensitivity reactions (types I, II, III of allergic reactions). Delayed hypersensitivity reactions (type IV allergic reactions). Characteristic. Stages and features of desensitization. Principles of desensitization.

Topic 10. Colloquium on Topics 7–9.

Topic 11. Pathophysiology of water-mineral and acid-base metabolism.

Dyhydria; classification principles and main types. Hyper-, iso- and hypo-osmolar hypo- and hyperhydration. Causes, pathogenetic features, symptoms and consequences. Edema, classification, characteristics of the main pathogenetic factors in the development of edema. Pathogenesis of cardiac, renal, inflammatory, toxic, allergic, hungry edema. Local and general

disorders with edema. Acid-base disorders: main types, causes, mechanisms of development and compensation.

Topic 12. Pathophysiology of metabolism.

Causes and consequences of impaired intake, digestion and absorption of carbohydrates. Causes and pathogenesis of hypo- and hyperglycemia. Etiology and pathogenesis of diabetes mellitus, its forms, clinical manifestations. Diabetic comas, their types and manifestations. Metabolic syndrome. Definition. Etiology. Mechanisms of development. Diagnostic criteria. Disturbances in the intake, digestion and absorption of fats. Disorders of fat transport. Hyperlipidemia. Their types and meaning. Obesity, causes, development mechanisms. Atherosclerosis. Causes, development mechanisms, role of endothelial dysfunction. Stages of atherogenesis. Consequences. Violation of protein intake from food, digestion and absorption disorders. Positive and negative nitrogen balance. Violation of protein synthesis and breakdown, development mechanisms, manifestations. Importance for the body.

Topic 13. Pathophysiology of tissue growth. Biological features of malignant cells. Etiology and pathogenesis of malignant growth. Antitumor resistance of the body.

Characteristics of the concepts “tumor growth”, “tumor”, tumor progression. Tumor-left atypia, its types. Etiology of tumors. Chemical carcinogens, their classification; precarcinogens and final carcinogens. Cocarcinogens and syncarcinogens. Pathogenesis of tumors. The importance of oncogenes, the role of oncoproteins in carcinogenesis. Precancerous conditions. Malignant and benign tumors, their differences. Characteristics of the mechanisms of antitumor resistance of the body. Interaction between tumor and organism. Tumor cachexia, paraneoplastic syndromes. Pathophysiological basis of prevention and therapy of tumor growth.

Topic 14. Colloquium on Topics 11–13.

Unit 2. Special pathophysiology

Topic 15. Pathophysiology of the red blood system. Anemia and erythrocytosis.

Typical forms of pathology and reactive changes in total blood volume. Blood loss: etiology, pathogenesis, clinical manifestations, consequences, mechanisms of compensatory reactions during blood loss. Normo-, hypo- and hypervolemia and their types depending on the ratio of formed elements and blood plasma. The reasons for their occurrence, clinical manifestations. Erythrocytosis (absolute and relative), etiology, pathogenesis, clinical manifestations, consequences. Anemia, characteristics of the concept, classification. Types of anemia, pathogenesis, clinical and hematological manifestations.

Topic 16. Pathophysiology of the white blood system. Leukocytosis and leukopenia. Leukemia.

Leukopoiesis and its disorders. Leukopenia, definition of the concept, causes and mechanisms of development, its types. Agranulocytosis, definition of the concept. Types of agranulocytosis, causes and mechanisms of their development. Picture of peripheral blood in various types of agranulocytosis. Panmyelophthisis. Leukocytosis, definition of the concept, types, causes and mechanisms of development. Changes in the leukocyte formula. Hemoblastoses: characteristics of the concept. Classification of hemoblastoses. Etiology of hemoblastoses. General pathogenesis of hemoblastoses. Leukemia, definition of the concept. Etiology and pathogenesis

of leukemia. Hematosarcomas. Leukemoid reactions. Main types, causes, blood picture, differences from leukemia.

Topic 17. Violations of the physico-chemical properties of blood. Pathology of the hemostatic system.

Mechanisms of hemostasis. Classification of hemostasis disorders. The concept of hypo- and hypercoagulation, hemorrhagic and thrombophilic syndromes. Causes and mechanisms of development of hypocoagulable states. Hemorrhagic conditions and syndromes: types, causes, general mechanisms of development, manifestations, consequences for the body. Causes and mechanisms of development of hypercoagulable states. Thrombotic syndrome: main causes, development mechanisms, manifestations, consequences for the body. Disorders of vascular-platelet hemostasis: characteristics of concepts, causes, types, mechanisms of development, manifestations. Disorders of coagulation hemostasis: characteristics of concepts, causes, types, mechanisms of development, manifestations. Thrombo-hemorrhagic conditions. DIC syndrome (disseminated intravascular coagulation).

Topic 18. Typical forms of circulatory disorders in cardiac dysfunction.

The concept of "heart failure". Kinds. Principles of classification. Myocardial and overload forms of heart failure, etiology and features of pathogenesis. Etiology and pathogenesis of coronary heart disease. Myocardial infarction. Mechanisms of myocardial hypertrophy. Features of a hypertrophied heart, mechanisms of its decompensation. Cardiac arrhythmias: characteristics of concepts, main types, causes and mechanisms of their development, changes on the ECG. Arterial hypertension. Types. Etiology and pathogenesis of hypertension. Clinical manifestations. Complications, consequences. Symptomatic hypertension: renal, vascular, endocrine. Adrenal hypertension. Types and mechanisms of increased blood pressure. Renal hypertension. Types and mechanisms of increased blood pressure.

Topic 19. Pathophysiology of external respiration.

Ventilation forms RF. Etiology and pathogenesis of pulmonary ventilation disorders of the obstructive and restrictive type. Examples of diseases. Impaired pulmonary perfusion - causes, manifestations, examples of diseases. Impaired diffusion of gases through the alveolar-capillary membrane (ACM). Violation of ventilation-perfusion ratios. Breathing regulation disorders. Pathological forms of breathing. Etiology and pathogenesis of pathological forms of breathing. Characteristics of the concept of "respiratory failure" (RF). Types of RF by etiology, course, degree of compensation, pathogenesis. Manifestations of RF.

Topic 20. Pathophysiology of internal respiration. Hypoxia.

Characteristics of the concept of hypoxia. Principles of classification of hypoxia. Etiology and pathogenesis of the main types of hypoxia: exogenous (hypoxic), respiratory, circulatory, hemic, tissue, overload, substrate. Emergency and long-term adaptive reactions during hypoxia, their mechanisms. Metabolism, structure, and cell function disorders in acute and chronic hypoxia. Principles of prevention and therapy of hypoxic conditions.

Topic 21. Colloquium on Topics 15–20

Topic 22. Pathophysiology of the digestive system.

Digestive disorders in the oral cavity. Main causes of dysphagia. Types of pathological secretion of gastric juice, etiology, characteristics, consequences. Disturbances of motor function of the stomach, types, causes, consequences. The relationship between disorders of the secretory and motor functions of the stomach. Manifestations of hyper- and hypochlorhydria. Pathology of the pyloric reflex. Acute and chronic gastritis, types, etiology, mechanism of development, digestive disorders. Ulcer of the stomach and duodenum. Etiology, pathogenesis and clinical manifestations of maldigestion and malabsorption syndromes. Disorders of the secretory function of the pancreas. Acute and chronic pancreatitis. Mechanisms of intestinal motor dysfunction (diarrhea, constipation). Etiology, pathogenesis. The role of intestinal microflora in digestion.

Topic 23. Pathophysiology of the liver.

Experimental methods for studying liver functions (N.V. Eck, E.S. London, I.P. Pavlov). Changes in the body during these interventions. Definition of the concept, etiology and pathogenesis of jaundice. Exchange of bilirubin in various types of jaundice. Definition of the concept and main manifestations of the syndromes of cholemia, acholia and hypercholia in various types of jaundice. Cholelithiasis. Portal hypertension syndrome. Definition, forms, clinical symptoms. Pathogenesis of ascites in portal hypertension. Etiology and pathogenesis of hepatitis. Etiology and pathogenesis of liver cirrhosis. Liver failure: types, causes, mechanisms of development, metabolic disorders and body functions. Liver coma. Definition, types (shunt, liver cell). Pathogenesis.

Topic 24. Pathophysiology of the kidneys.

Disruption of basic processes in the kidneys. Kidney function tests. Their significance for the functional diagnosis of kidney pathology. Pathological components of urine, changes in the quantity and specific density of urine. Proteinuria, hematuria, leukocyturia. Causes, types, diagnostic value. Nephrotic syndrome. Causes, development mechanisms, consequences, prevention. Acute renal failure. Forms, etiology, development mechanisms, consequences. Chronic renal failure. Causes, stages, mechanisms of development. Uremia. Glomerulonephritis. Pathogenetic classification. Clinical manifestations, principles of treatment.

Topic 25. Colloquium on Topics 22-24.

Topic 26. Endocrinopathies.

Characteristics of the main causes and mechanisms of endocrine disorders. Pathophysiology of the pituitary gland. Acromegaly, gigantism, dwarfism. Itsenko-Cushing's disease. Diabetes insipidus. Mechanisms of their development. Pathophysiology of the adrenal glands. Addison's disease, pheochromocytoma, Itsenko-Cushing syndrome. Mechanisms of their development. Primary and secondary aldosteronism. Conn's disease. Mechanisms of development. Pathophysiology of the thyroid gland.

Topic 27. Pathophysiology of the nervous system and higher nervous activity.

General causes and mechanisms of disorders of the nervous system. Typical pathological processes in the nervous system. Braking deficiency. Denervation syndrome. Spinal shock. Deafferentation. Trophic disturbances. Pain. Pain receptors. Pain mediators. Mechanism of pain. Types of pain (somatic, neuropathic). Phantom pain. Causalgia. The meaning of pain for the body.

Topic 28. Colloquium on Topics 26, 27.

3. Training support materials

- multimedia presentations on the discipline are available on MAU LMS Moodle;
- practical training manuals are available on MAU LMS Moodle;
- learning materials are available on MAU official website at [«Информация по образовательным программам, в том числе адаптированным»](#).

4. Discipline assessment materials

Discipline assessment materials is a separate document within the educational programme, it includes:

- a list of competencies indicating the stages of their achievement within the discipline;
- formative assessment tasks;
- interim assessment tasks;
- tasks for internal assessment of education quality.

5. The list of main and supplementary literature (printed sources, electronic textbooks and (or) resources of Digital Library Systems)

Main literature:

1. Litvitskii P. F. Patofiziologiya : uchebnik dlya ispol'zovaniya v obrazovatel'nykh uchrezhdeniyakh, realizuyushchikh osnovnye professional'nye obrazovatel'nye programmy vysshego obrazovaniya urovnya spetsialiteta po napravleniyam podgotovki 31.05.01 "Lechebnoe delo", 31.05.02 "Pediatriya", 32.05.01 "Mediko-profilakticheskoe delo" / FGAOU VO "Pervyi Moskovskii gosudarstvennyi meditsinskii universitet im. I. M. Sechenova" Ministerstva zdravookhraneniya Rossiiskoi Federatsii (Sechenovskii Universitet). – 7-e izd., pererab. i dop. – Moskva : GEOTAR-Media, 2021. – 859 s. : il. – Bibliogr.: s. 850. - Predm. ukaz.: s. 851-859. – ISBN 978-5-9704-6671-9 [Grif]. – Tekst (vizual'nyi) : neposredstvennyi. Litvitskii, P. F. Patofiziologiya : uchebnik / P. F. Litvitskii. - 7-e izd. , pererab. i dop. - Moskva : GEOTAR-Media, 2023. - 864 s. - ISBN 978-5-9704-7932-2. - Tekst : elektronnyi // EBS "Konsul'tant studenta" : [sait]. - URL : <https://www.studentlibrary.ru/book/ISBN9785970479322.html>
2. Novitskii, V. V. Patofiziologiya : uchebnik : v 2 t. / pod red. V. V. Novitskogo, O. I. Urazovoi. - 5-e izd. , pererab. i dop. - Moskva : GEOTAR-Media, 2020. - T. 1. - 896 s. : il. DOP. obshchii. - 896 s. - ISBN 978-5-9704-5721-4. - Tekst : elektronnyi // EBS "Konsul'tant studenta" : [sait]. - URL : <https://www.studentlibrary.ru/book/ISBN9785970457214.html>
3. Novitskii, V. V. Patofiziologiya : uchebnik : v 2 t. / pod red. V. V. Novitskogo, O. I. Urazovoi. - 5-e izd. , pererab. i dop. - Moskva : GEOTAR-Media, 2020. - T. 2. - 592 s. : il. - 592 s. - ISBN 978-5-9704-5722-1. - Tekst : elektronnyi // EBS "Konsul'tant studenta" : [sait]. - URL : <https://www.studentlibrary.ru/book/ISBN9785970457221.html>

Supplementary literature:

1. Patologiya. Tom 1 : uchebnik : v 2 t. / pod red. V. V. Davydova, V. A. Cheresheva. - 2-e izd., pererab. i dop. - Moskva : GEOTAR-Media, 2023. - 608 s. - ISBN 978-5-9704-6458-8, DOI: 10.33029/9704-6458-8-PDC1-2023-1-608. - Elektronnaya versiya dostupna na saite EBS "Konsul'tant studenta" : [sait]. URL: <https://www.studentlibrary.ru/book/ISBN9785970464588.html>
2. Patologiya. Tom 2 : uchebnik: v 2 t. / pod red. V. V. Davydova, V. A. Cheresheva. - 2-e izd., pererab. i dop. - Moskva : GEOTAR-Media, 2023. - 664 s. - ISBN 978-5-9704-6459-5, DOI: 10.33029/9704-6459-5-PDC2-2023-1-664. - Elektronnaya versiya dostupna na saite EBS

- "Konsul'tant studenta" : [sait]. URL:
<https://www.studentlibrary.ru/book/ISBN9785970464595.html>
3. Davydov, V. V. Patologiya. Testy i situatsionnye zadachi : uchebnoe posobie / pod red. V. V. Davydova, V. A. Chereshneva. - Moskva : GEOTAR-Media, 2022. - 320 s. - ISBN 978-5-9704-6437-3. - Tekst : elektronnyi // EBS "Konsul'tant studenta" : [sait]. - URL : <https://www.studentlibrary.ru/book/ISBN9785970464373.html>
4. Samusev, R. P. Patofiziologiya. Klinicheskaya patofiziologiya. Rukovodstvo k prakticheskim zanyatiyam / pod red. Urazovoi O. I. , Novitskogo V. V. - Moskva : GEOTAR-Media, 2020. - 368 s. - ISBN 978-5-9704-5079-6. - Tekst : elektronnyi // EBS "Konsul'tant studenta" : [sait]. - URL : <https://www.studentlibrary.ru/book/ISBN9785970450796.html>
5. Antonov, V. G. Vodno-elektrolitnyi obmen i ego narusheniya : rukovodstvo dlya vrachei / V. G. Antonov i dr. ; pod red. A. I. Karpishchenko. - Moskva : GEOTAR-Media, 2018. - 208 s. - ISBN 978-5-9704-4619-5. - Tekst : elektronnyi // EBS "Konsul'tant studenta" : [sait]. - URL : <https://www.studentlibrary.ru/book/ISBN9785970446195.html>
6. Poryadina, G. V. Patofiziologiya : kurs lektsii : uchebnoe posobie / pod red. G. V. Poryadina - Moskva : GEOTAR-Media, 2018. - 688 s. - ISBN 978-5-9704-4765-9. - Tekst : elektronnyi // EBS "Konsul'tant studenta" : [sait]. - URL : <https://www.studentlibrary.ru/book/ISBN9785970447659.html>

6. Professional databases and information reference systems

- 1) The state legal information system - the official website of legal information - URL: <http://pravo.gov.ru>
- 2) Information system "Single window of access to educational resources" - URL: <http://window.edu.ru>
- 3) Jaypeedigital (<https://www.jaypeedigital.com/home>) – online-platform of medical resources from Jaypee Brothers Medical Publishers
Introduction to the platform (in English): https://disk.yandex.ru/i/K3Q61Zerp_x5Kw
- 4) S Ebooks (Medical & Science) (<https://eduport-global.com/>) - electronic library of medical literature from CBS Publishers & Distributors Pvt. Ltd.
- 5) Legal reference system. Consultant Plus - URL: <http://www.consultant.ru/>
- 6) University Library Online <https://biblioclub.ru> (Access until May 29, 2025)
- 7) Electronic library system “Lan” <https://e.lanbook.com/> (Access from October 1, 2025)
- 8) Electronic library system “Yurait”, access until December 30, 2024.
- 9) Electronic library system “Student Consultant” <http://www.studentlibrary.ru/> (access until May 24, 2025. Access to [Медицина. Здравоохранение \(BO\)](#) and [Медицина \(BO\) ГЭОТАР-Медиа. Books in English](#))

7. The list of licensed and openly distributed software, including domestic software

1. Microsoft Office Service Pack
2. ABBYY FineReader Optical text recognition system

8. Ensuring mastering the discipline for people with special needs

Students with special needs are provided with printed and (or) electronic educational resources adapted to their needs.

9. The material and technical support of the discipline (module) is presented in the appendix to the academic programme "Material and technical conditions for the implementation of the educational programme" and includes:

- classrooms for conducting training sessions provided for by the specialty programme, fitted with technical equipment;

- spaces for self-study work fitted with computer equipment with the Internet connection and access to MAU LMS Moodle.

It is allowed to replace the equipment with its virtual counterparts.

10. Study load distribution by type of educational activity

Table 1 - Study load distribution

Type of educational activity	The discipline (module) study load distribution by the forms of training		
	Full-time		
	Semester		Total hours
5	6		
Lectures	28	26	54
Seminars	56	56	112
Self-study work	24	26	50
Preparation for interim assessment		36	
Total hours on the discipline / in the form of seminars	108/56	144/56	252
Interim and formative assessment			
Examination		+	

The list of seminar topics by forms of training

№	Seminar topics
1	2
	Full-time
1	Introduction. Subject and tasks of pathophysiology. General nosology
2	The pathogenic effect of environmental factors
3	Cell damage
4	Reactivity and resistance of the body, their role in pathology
5	Pathophysiology of peripheral circulation and microcirculation. Violations of the rheological properties of blood
6	Pathophysiology of inflammation
7	Pathophysiology of the acute phase response (APR). Fever. Hyper- and hypothermia
8	Pathophysiology of disorders of immune reactivity
9	Pathophysiology of water-mineral and acid-base metabolism
10	Pathophysiology of metabolism
11	Pathophysiology of tissue growth. Biological features of malignant cells. Etiology and pathogenesis of malignant growth. Antitumor resistance of the body
12	Pathophysiology of the red blood system. Anemia and erythrocytosis
13	Pathophysiology of the white blood system. Leukocytosis and leukopenia. Leukemia
14	Violations of the physical and chemical properties of blood. Pathology of the hemostasis system
15	Typical forms of circulatory disorders in cardiac dysfunction

16	Pathophysiology of external respiration
17	Pathophysiology of internal respiration
18	Pathophysiology of the digestive system
19	Pathophysiology of the liver
20	Pathophysiology of the kidneys
21	Endocrinopathies
22	Pathophysiology of the nervous system and higher nervous activity