MINISTRY OF EDUCATION AND SCIENCE OF THE KYRGYZ REPUBLIC

Government-run Educational Institution of Higher Professional Education
Kyrgyz-Russian Slavic University
School of Medicine

ENDORSED BY
Dean of medical faculty
Karaeva R.R.
"02" 09 2024

Pathophysiology, clinical pathophysiology

Course Outline (Module)

Assigned to Department of Pathological physiology

Academic Curriculum 560001 General medicine

Mode of Study **Intramural**
Total Credit Value **9 credit point**

Course Hours
including: 324
in-class learning 198
individual work 108
exams 18

Scope of Testing Semesters:
exams 5
credits 4

Course Hours Scheduling (per semester)						
Semester Academic Year	4 (1.1)		5 (1.2)		Total	
Weeks	18,7		18			
Type of Traning	AC	CO	AC	CO	AC	CO
Lectures	18	18	54	54	72	72
Practical Session	54	54	72	72	126	126
Total In-class Session	108	108	90	90	198	198
Individual Work Assessment	72	72	126	126	198	198
Face-to-face Learning			18	18	18	18
Individual Work	63	63	63	63	126	126
Total	90	90	108	108	324	324

The Course outline developed by:
Abdukarimova E.E., c.m.s., associate Professor; Kakeev B.A., d.m.s., Professor
Reviewers:
Head of the Department of Pathological anatomy of medical faculty of Kyrgyz Russian Slavic University Ahmetova M.I., c.m.s., associate Professor ; associate Professor of the Department of Pathology of International Higher School of Medicine , Pak I.V., c.m.s., associate Professor

The Course Outline
Pathophysiology, clinical pathophysiology

developed in full compliance with GESHPE:

Government Educational Standards of Higher Professional Education for students trained for specialty 560001 (general medicine).

in accordance with Academic Curriculum:
560001 General medicine
confirmed by KRSU Board of Academics in "28"_/06/2024__ record № 11

The Course Outline endorsed by _Pathophysiology_Department Meeting

Record of _28__ ___08____ 2024__ . №_1__
Valid for: 2024-2029 academic year
The Head of Department d.m.s., Professor Kakeev B.A

The course outline endorsed for the following academic year

Chairman of the Educational and Methodological Board
__ _____ 2024

The course outline has been revised, considered and endorsed for implementation
in 2024-2025 Academic Year at the Staff Meeting of Pathophysiology Department

Record of 28 08 2024 y. № 1
The Head of Department d.m.s., Professor Kakeev B. A

The course outline endorsed for the following academic year

Chairman of the Educational and Methodological Board
__ _____ 2025

The course outline has been revised, considered and endorsed for implementation
in 2025-2026 Academic Year at the Staff Meeting of Pathophysiology Department

Record of 3 09 2025 y. № 1
The Head of Department d.m.s., Professor Kakeev B. A

The course outline endorsed for the following academic year

Chairman of the Educational and Methodological Board
__ _____ 2026

The course outline has been revised, considered and endorsed for implementation
in 2026-2027 Academic Year at the Staff Meeting of Pathophysiology Department

Record of __ _____ 2026 y. № __
The Head of Department d.m.s., Professor Kakeev B. A

The course outline endorsed for the following academic year

Chairman of the Educational and Methodological Board
__ _____ 2027

The course outline has been revised, considered and endorsed for implementation
in 2027-2028 Academic Year at the Staff Meeting of Pathophysiology Department

Record of __ _____ 2027 y. № __
The Head of Department d.m.s., Professor Kakeev B. A

1. COURSE OUTLINE OBJECTIVES
The general purpose of teaching pathophysiology, clinical pathophysiology is to form a student's scientific knowledge of the general laws and specific mechanisms of occurrence, development and outcomes of pathological processes, reactions, individual diseases and disease conditions, the principles of their detection, therapy and prevention.
The objectives of this discipline are: teaching students the basic concepts and modern concepts of General nosology; teaching students etiology, pathogenesis, principles of detection, treatment and prevention of the most socially significant diseases and pathological processes, taking into account age characteristics; teaching students the common patterns and mechanisms of emergence, development and outcomes of pathological processes, conditions, reactions, and diseases ;the training of students carrying out pathophysiological analysis of pathological syndrome, pathological processes, forms of individual pathology and disease ;students acquire the knowledge and skills to formulate the principles (algorithms, strategies) and methods of detection, treatment and prevention of pathological processes, conditions, reactions and diseases; acquisition of students 'knowledge and skills to analyze scientific literature and official statistical reviews, prepare reviews of scientific literature or abstracts on modern medical scientific problems; acquisition of students' knowledge and skills to carry out statistical analysis and preparation of reports on the study; training of students to comply with the basic requirements of information security; acquisition of students 'skills of methodological, methodological and practical bases of clinical thinking and effective professional action of the doctor; acquisition of students' knowledge and skills to solve individual research and scientific-applied tasks in the field of health research on etiology and pathogenesis, diagnosis, treatment, rehabilitation and prevention of human diseases.

2. PLACE OF THE COURSE IN THE EDUCATIONAL PROGRAM	
Educational Program Units:	
2.1	**Students' Preliminary Training Requirements:**
2.1.1	"Philosophy" of Knowledge: methods and techniques of philosophical analysis of problems; forms and methods of scientific knowledge, their evolution. Skills: competently and independently analyze and assess the social situation in the Kyrgyz Republic, Russia and abroad and carry out their activities taking into account the results of this analysis. Skills: presenting an independent point of view, analysis and logical thinking, public speaking, ethical reasoning, debate and round tables.
2.1.2	"Physics, mathematics" Knowledge: mathematical methods for solving intellectual problems and their application in medicine; the main physical phenomena and laws underlying the processes occurring in the human body; characteristics of the impact of physical factors on the body; physical foundations of medical equipment. Skills: use of physical equipment. Skills: knowledge of methods of mathematical, statistical analysis of biomedical data of patients.
2.1.3	Biology of Knowledge: the General laws of the origin and development of life; of anthropogenesis and ontogenesis of a person; the laws of genetics, its importance for medicine; the laws of heredity and variation in individual development as the basis for the understanding of the pathogenesis and etiology of hereditary and multifactorial diseases.
2.1.4	Skills: use of biomedical laboratory equipment. Skills: proficiency in methods of studying inheritance in humans (cytogenetic method, genealogical method, twin method).
2.1.5	" Biochemistry " Knowledge: the chemical and biological essence of the processes occurring in the living organism at the molecular and cellular levels; the structure and biochemical properties of the main classes of biologically important compounds, the main metabolic pathways of their transformation; the role of cell membranes and their transport systems in metabolism in the body. Skills: interpret the results of the most common methods of laboratory diagnostics to identify pathological processes in organs. Skills: knowledge of the concept of limitation in the authenticity and specificity of the most common laboratory tests; preliminary diagnosis based on the results of biochemical studies of human biological fluids.
2.1.6	"Human Anatomy" Knowledge: anatomical-physiological, age-sexual and individual characteristics of the structure and development of a healthy and sick organism. Skills: to palpate on the person the main bone landmarks, to outline the topographic contours of the organs and the main vascular and nerve trunks.Skills: proficiency in medical and anatomical conceptual apparatus.
2.1.7	"Histology, embryology, Cytology" Knowledge: basic regularities of development and functioning of the body on the basis of the structural organization of cells, tissues and organs; histogenetically characteristics of fabric elements; methods of research.

2.1.8	Abilities: to work with magnifying equipment (microscopes, optical and simple magnifiers); to analyze histophysiological structure of cells, tissues and organs.Skills: microscopy and analysis of histological preparations and electronic microphotography.
2.1.9	“Pathological anatomy” Knowledge: basic laws of development of diseases on the basis of changes in the structural organization of cells, tissues and organs; histogenetically features of the tissue elements at a pathology ; methods of research. Skills: to work with magnifying equipment (microscopes, optical and simple magnifiers); to analyze histopathological assessment of various cellular, tissue and organ structures in pathology .Skills: microscopy and analysis of histological preparations and electronic microphotography.
2.1.10	"Normal physiology" Knowledge: functional systems , their regulation and self-regulation when exposed to the environment in the normal.Skills: interpret the results of the most common methods of functional diagnostics, thermometry to detect pathological processes in organs and systems.
2.1.11	Skills: ability to plan and conduct a physiological experiment, analyze the results.
2.1.12	"Microbiology, Virology" Knowledge: classification, morphology and physiology of microorganisms and viruses, their impact on health, methods of microbiological diagnostics; safety regulations and work in biological laboratories, reagents, devices, animals. Skills: to carry out statistical processing of experimental data. Skills: use information on the principles of sterilization, disinfection and antiseptic treatment of instruments and equipment to avoid infection of the doctor and the patient.
2.1.13	"Immunology" Knowledge: structures and functions of the immune system , its mechanisms of development and functioning, basic methods of immunodiagnostics, methods for assessing the immune status and indications for immunotropic therapy. Skills: to justify the need for clinical and immunological examination of a sick person. Skills: preliminary diagnosis based on the results of laboratory and instrumental examination.

2.2	**Course Units and Practical Sessions imposing the prior Proficiency**
2.2.1	Therapy, surgery, obstetrics and gynecology, as well as all other specialties related to the diagnosis and treatment of patients.

3. STUDENTS’ COMPETENCIES RESULTING FROM THE COURCE UNIT (MODULE)	
PC-5: Able to define main pathologica1 states in a patient, symptoms and syndromes of diseases, clinical entities in accordaпce with International statistical classification of Diseases and Related Health problems of the X review	
Knowledge:	
Level 1	procedures of identifing main pathological states in a patient, symptoms and syndromes of diseases, clinical entities
Level 2	specific features of identifying various types of pathological states, diseases symptoms and syndromes, clinical entities in accordaпce with ISCD of the X review.
Level 3	basic syndromes of organ and system abnormalities and their features in differential exclusions of various nosological entities in compliance with ISCD of the X review.
Skills:	
Level 1	comprehend the obtained results of investigating the main clinical entitites of diseases;
Level 2	analyze various types of pathological states, diseases symptoms and syndromes, clinical entities in accordaпcewith ISCD of the X review.
Level 3	indicate practical utility when comparing specific abnormal diseases' syndromes and svmotoms
Expertise:	
Level 1	experieпce in identifuing main pathological states in a patient, symptoms and syndromes of diseases;
Level 2	methods of searching, identifying and classifi,ing the main pathological states, diseases' syndromes and symptoms clinical entities in accordance with the IscD of the X review
Level 3	experieпce in independent reasoning of aggregating various symptoms and syndromes into clinical entities in accordaпce with ISCD of the X review

Final Students’ Competences

3.1	**Knowledge:**
3.1.1	basic concepts of general nosology;
3.1.2	the role of causes, conditions, reactivity of the body in the occurrence, development and completion (outcome) of diseases;
3.1.3	causes and mechanisms of typical pathological processes, States and reactions, their manifestations and significance for the body in the development of various diseases;
3.1.4	causes, mechanisms and main manifestations of typical disorders of organs and physiological systems of the body;
3.1.5	etiology, pathogenesis, manifestations and outcomes of the most frequent forms of pathology of organs and physiological systems, principles of etiological and pathogenetic therapy;

3.1.6	the importance of physical and formalized (non-physical) modeling of diseases and disease States, pathological processes, States and reactions for medicine and biology in the study of pathological processes;
3.1.7	the role of various modeling methods: experimental (on animals, isolated organs, tissues and cells; on artificial physical systems), logical (intellectual), computer, mathematical, etc. in the study of pathological processes; their capabilities, limitations and prospects;

3.1.8	the importance of pathophysiology for the development of medicine and health; the relationship of pathophysiology with other biomedical and medical disciplines.

4. COURSE (MODULE) STRUCTURE AND CONTENT							
Class Code	**Subject Name /Type of Class/**	**Semester / Academic Year**	**Hours**	**Competencies**	**Literature**	**Interactive Sessions**	**Notes**
	Section 1. "General nosology, pathogenic influence of environmental factors on the health. Cell injury disorders. The role of reactivity, resistance and inheritance in the development of pathology. The pathophysiology of allergic reaction".						
1.1	The subject and tasks of pathophysiology. Basic concepts of nosology. General etiology and pathogenesis, their relationship History of domestic and world pathophysiology. / Lec /	4	2	PC-5	L1.1 L1.2 L1.3 L2.1 L2.2	0	
1.2	Pathophysiology of allergy. Classification of allergic reactions. Stages of allergic reactions, their pathophysiological characteristics. Etiopathogenesis and clinical manifestations of allergic reactions. / Lec /	4	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
1.3	Introduction to the subject. Subject, tasks, methods and sections of pathological physiology. Basic concepts of nosology. General etiology and pathogenesis, their interrelation. Modeling of diseases. /Prac/	4	4	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
1.4	Etiology and pathogenesis of the damaging effect of environmental factors on the body and their consequences: overheating, hypothermia, burns, burn disease, kinetosis, the effect of electric current on the body. /Prac/	4	4	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	2	
1.5	Pathophysiology of typical cell lesions. Adaptation of the cell to damage. Mechanisms of apoptosis and necrosis. /Prac/	4	4	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
1.6	Violation of specific and nonspecific reactivity and resistance of the body. Pathology of phagocytosis: causes and consequences. Role of reactivity and resistance of the organism in the development of pathology./Prac/	4	4	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
1.7	Pathophysiology of allergy. Classification of allergic reactions. Stages of allergic reactions, their pathophysiological characteristics. Etiopathogenesis and clinical manifestations of allergic reactions./Prac/	4	4	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	2	
1.8	Etiology and pathogenesis of hereditary and congenital diseases./Prac/	4	4	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2		

1.9	Introduction to the subject. Subject, tasks, methods and sections of pathological physiology. Basic concepts of nosology. General etiology and pathogenesis, their interrelation. Modeling of diseases. /Sw/	4	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2		
1.10	Etiology and pathogenesis of the damaging effect of environmental factors on the body and their consequences: overheating, hypothermia, burns, burn disease, kinetosis, the effect of electric current on the body./Sw/	4	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2		
1.11	Pathophysiology of typical cell injury. Adaptation of the cell to damage. Mechanisms of apoptosis and necrosis./Ssw/	4	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2		
1.12	Violation of specific and nonspecific reactivity and resistance of the body. Pathology of phagocytosis: causes and consequences. Role of reactivity and resistance of the organism in the development of pathology./Ssw/	4	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2		
1.13	Pathophysiology of allergy. Classification of allergic reactions. Stages of allergic reactions, their pathophysiological characteristics. Etiopathogenesis and clinical manifestations of allergic reactions./Ssw/	4	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2		
1.14	Etiology and pathogenesis of hereditary and congenital diseases./Ssw/	4	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
1.15	General etiology and pathogenesis of typical forms of cell damage./Lec/	4	2	PC-5	L1.1 L1.2 L 1.3L2.1 L2.2	0	

	Section 2. "Typical pathological processes- local blood circulation disorders, inflammation, fever and infection process						
2.1	Inflammation. The difference between acute and chronic inflammation. Exudate and transudate./Lec/	4	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
2.2	Violations of the local circulation: - arterial and venous hyperemia, ischemia, stasis.	4	4	PC-5	L1.1 L1.2 l 1.3 L2.1 L2.2	0	
	Etiology, mechanisms of development and outcomes of thrombosis and embolism./Prac/						
2.3	Etiology and pathogenesis of inflammation. Vascular reactions in the focus of inflammation. Local and common signs of inflammation. Inflammation, mechanisms of exudation. Types of exudate. Pathogenetic features of acute and chronic inflammation./Prac/	4	4	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	

2.4	Violations of the local circulation: - arterial and venous hyperemia, ischemia, stasis. Causes, mechanisms of development and outcomes of thrombosis and embolism. /Sw/	4	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
2.5	Etiology and pathogenesis of inflammation. Vascular reactions in the focus of inflammation. Local and common signs of inflammation./Ssw/	4	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
2.6	Inflammation, mechanisms of exudation. Types of exudate. Pathogenetic features of acute and chronic inflammation./Ssw/	4	2	PC-5	L1.1 L1.2 l 1.3 L2.1 L2.2	0	
2.7	Etiology and pathogenesis of fever./Ssw/	4	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
2.8	Pathophysiology of the infectious process. Pathophysiology of sepsis./Ssw/	4	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
2.9	Etiology and pathogenesis of fever./Lec/	4	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
2.10	Etiology and pathogenesis of fever./Prac/	4	4	PC-5	L1.1 L1.2 l 1.3 L2.1 L2.2	0	
2.11	Pathophysiology of the infectious process. Pathophysiology of sepsis./Prac/	4	4	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	3	
	Section 3. "Typical forms of the pathology of the external respiration and cardiovascular system"						
3.1	Pathophysiology of insufficiency of the external respiration system . Obstructive and restrictive forms of insufficiency of external respiration and mechanisms of their development./Lec/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
3.2	Pathophysiology of coronary insufficiency. Types, causes and mechanisms of development of coronary insufficiency. Pathogenesis and the main clinical manifestations of myocardial infarction and cardiogenic shock./Lec/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
3.3	Pathophysiology of arterial hypo - and hypertension. Etiology and pathogenesis of symptomatic arterial hypertension and hypertension diseases (HD). /Lec/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
3.4	Etiology and pathogenesis of cardiac arrhythmias./Lec/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
3.5	Pathophysiology of chronic heart failure. Pathogenesis of the main clinical manifestations of chronic heart failure (CHF)./Lec/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
3.6	Pathophysiology of cardiac arrhythmias and conduction./Ssw/	5	2	PC-5	L1.1 L1.2 L2.1 L2.2	0	
3.7	Pathophysiology of coronary insufficiency. Pathogenesis of cardiogenic shock. /Ssw/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
3.8	Pathophysiology of insufficiency of the external respiration system./Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	

3.9	Pathophysiology of cardiac arrhythmias and conduction./Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
3.10	Pathophysiology of coronary insufficiency. Pathogenesis of cardiogenic shock. /Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
3.11	Pathophysiology of insufficiency of the external respiration system./Ssw/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
3.12	Pathophysiology of arterial hypo - and hypertension. Etiology and pathogenesis of symptomatic arterial hypertension and hypertension diseases /Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
3.13	Pathophysiology of chronic heart failure. Pathogenesis of the main clinical manifestations of chronic heart failure (CHF)./Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
3.14	Pathophysiology of arterial hypo - and hypertension. Etiology and pathogenesis of symptomatic arterial hypertension and hypertension diseases /Ssw/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
3.15	Pathophysiology of chronic heart failure. Pathogenesis of the main clinical manifestations of chronic heart failure (CHF)./Ssw/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	

	Section 4. "Typical metabolic disorders - of protein, carbohydrate, fatty, acid-base and water-salt metabolism. Pathophysiology of tumor growth and hypoxic conditions".						
4.1	Typical disorders of protein metabolism. Starvation. /Lec/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
4.2	Typical disorders of carbohydrate metabolism. Etiology and pathogenesis of type I and type II diabetes mellitus./Lec/	5	2	PC-5	L1.1 L1.2 L.1.3 L2.1 L2.2	0	
4.3	Typical forms of basic metabolism rate and protein metabolism. Starvation. /Prac/	5	3	PC-5	L1.1 L1.2 L.1.3 L2.1 L2.2	0	
4.4	Typical forms of carbohydrate metabolism. Etiopathogenesis of diabetes mellitus../Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
4.5	Typical violations of lipid metabolism. Etiology and pathogenesis of alimentary obesity and atherosclerosis./Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
4.6	Typical forms of disturbance of the acid-base state and water-salt metabolism./Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
4.7	Pathophysiology of tumor growth./Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
4.8	Pathophysiology of hypoxic conditions. High altitude and mountain sickness./Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
4.9	Typical forms of basic and protein metabolism. Starvation. /Ssw/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
4.10	Typical forms of violation of carbohydrate metabolism. Etiopathogenesis of diabetes mellitus./Ssw/	5	2	PC-5	L1.1 L1.2 L1.3 L2.1 L2.2	0	
4.11	Typical violations of lipid metabolism. Etiology and pathogenesis of alimentary obesity and atherosclerosis./Ssw/	5	2	PC-5	L1.1 L1.2 L1.3 L2.1 L2.2	0	
4.12	Typical forms of disturbance of the acid-base state and water-salt metabolism./Sw/	5	2	PC-5	L1.1 L1.2 L2.1 L2.2	0	
4.13	Pathophysiology of tumor growth./Sw/	5	2	PC-5	L1.1 L1.2 L2.1 L2.2	0	
4.14	Pathophysiology of hypoxic conditions. Altitude and mountain sickness./Sw/	5	2	PC-5	L1.1 L1.2 L2.1 L2.2	0	
4.15	Pathophysiology of the tumor process./Lec/	5	2	PC-5	L1.1 L1.2 L2.1 L2.2	0	
4.16	Pathophysiology of hypoxia./Lec/	5	2	PC-5	L1.1 L1.2 L2.1 L2.2	0	
	Section 5. "Typical forms of pathology of the blood system"						

5.1	Pathophysiology of anemic syndrome. Etiology and pathogenesis of iron deficiency, B12 - and folic-deficiency anemia. The main clinical manifestations and mechanisms of their development. /Lec/	5	2	PC-5	L1.1 L1.2 L2.1 L2.2	0	
5.2	Changes in the total amount of blood: normal; Hypo and hypervolemia, their types, causes and mechanisms of development. The pathogenesis of post-hemorrhagic anemia. /Sw/	5	2	PC-5	L1.1 L1.2 L2.1 L2.2	0	
5.3	Pathophysiology of the system of white blood cells. Etiopathogenesis of leukocytosis, leukopenia and leukemoid reaction. Agranulocytosis. /Sw/	5	2	PC-5	L1.1 L1.2 L2.1 L2.2	0	
5.4	Etiology and pathogenesis of the leukemias. /Sw/	5	2	PC-5	L1.1 L1.2 L2.1 L2.2	0	
5.5	Pathophysiology of hemostasis.DIC syndrome /Sw/	5	2	PC-5	L1.1 L1.2 L2.1 L2.2	0	
5.6	Typical forms of pathology and reactive changes in the total volume, the ratio of plasma and shaped blood elements. Etiology and pathogenesis of posthemorrhagic and hemolytic anemia's. Mechanisms of compensation for acute blood loss. /Lec/	5	2	PC-5	L1.1 L1.2 L2.1 L2.2	0	
5.7	Pathophysiology of the white blood system. Leukocytosis and leukopenia. Agranulocytosis. /Lec/	5	2	PC-5	L1.1 L1.2 L2.1 L2.2	0	
5.8	Etiology and pathogenesis of leukemia and leukemic reactions. /Lec/	5	2	PC-5	L1.1 L1.2 L2.1 L2.2	0	
5.9	Typical forms of disorders in the hemostasis system. The pathophysiology of DIC. /Lec/	5	2	PC-5	L1.1 L1.2 L2.1 L2.2	0	
5.10	The pathophysiology of hemostasis.DIC syndrome. /Prac/	5	3	PC-5	L1.1 L1.2 L2.1 L2.2	0	
5.11	Changes in the total amount of blood: normal; Hypo and hypervolemia, their types, causes and mechanisms of development. The pathogenesis of post-hemorrhagic anemia. /Prac/	5	3	PC-5	L1.1 L1.2 L2.1 L2.2	2	Role-play situation game
5.12	Etiology and pathogenesis of iron deficiency, Vit B12 - folic and hemolytic anemia.. /Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
5.13	Pathophysiology of the leukocyte system. Etiopathogenesis of leukocytosis, leukopenia and leukemoid reaction.Agranulocytosis. /Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
5.14	The Etiology and pathogenesis of the leukemia. /Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
	Section 6. "Typical forms of pathology the liver and gastrointestinal tract"						
6.1	Pathophysiology of the liver. Jaundices. Causes and signs of liver failure. The pathogenesis of hepatic coma /Lec/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	

6.2	Pathophysiology of the liver. Jaundice, species. The etiology and pathogenesis. Liver failure. Signs of the effects. Development mechanisms of portal hypertension and hepatic coma and its main manifestations. /Sw/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
6.3	Typical forms of pathology of the gastrointestinal tract. The etiology and pathogenesis of gastric ulcer of the duodenum. /Sw/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
6.4	Pathophysiology of the digestive system. Etiology and pathogenesis of gastric ulcer and duodenal ulcer. /Lec/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
6.5	Pathophysiology of the liver. Jaundice, species. The etiology and pathogenesis. Liver failure. Signs of the effects. Development mechanisms of portal hypertension and hepatic coma and its main manifestations. /Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
6.6	Typical forms of pathology of the gastrointestinal tract. The etiology and pathogenesis of gastric ulcer of the duodenum./Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
	Section 7. "Typical forms of pathology of the kidney"						
7.1	Pathophysiology of the kidneys. Pathophysiological characteristics of chronic diffuse glomerulonephritis (CDG) and pyelonephritis. Features of kidney disease in children. /Lec/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
7.2	Pathophysiology of renal failure ARF and chronic renal failure. Etiology and pathogenesis of uremia and uremic coma. /Lec/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
7.3	Pathophysiology of the kidneys. Mechanisms of violation of the basic processes of formation and excretion of urine. The change in the number and composition of urine. Nephrotic and nephritic syndrome. Etiology and pathogenesis of acute and chronic diffuse glomerulonephritis. Pyelonephritis. /Sw/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
7.4	Pathophysiology of renal failure. Etiology and pathogen of acute renal failure (ARF) and chronic renal failure (CRF).The pathogenesis of uremia and uremic coma. /Sw/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
7.5	Pathophysiology of the kidneys. Mechanisms of violation of the basic processes of formation and excretion of urine. The change in the number and composition of urine. Nephrotic and nephritic syndrome. Etiology and pathogenesis of acute and chronic diffuse glomerulonephritis. Pyelonephritis. /Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
7.6	Pathophysiology of renal failure. Etiology and pathogen of acute renal failure (ARF) and chronic renal failure (CRF).The pathogenesis of uremia and uremic coma. /Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
	Section 8. "Typical forms of pathology of endocrine and nervous						

8.1	Etiology and pathogenesis of iron deficiency, Vit B12 - folio-deficiency and hemolytic anemia. /Sw/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
8.2	General etiology and pathogenesis of endocrinopathy. Pathophysiological characteristics of hypo-and hyperfunction of hypothalamic-pituitary system. /Lec/	5	2	PC-5	L1.1 L1.2 L.1.3 L2.1 L2.2	0	
8.3	Pathophysiological characteristics of the Hypo-and hyperfunction of the thyroid gland, adrenal glands and sex glands. Endemic goiter, etiology and pathogenesis. /Lec/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
8.4	Pathophysiology of the nervous system: General etiology and pathogenesis of disorders of the nervous system. Disorders of locomotor, sensory and trophic functions of the nervous system. The pathophysiology of pain. /Lec/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
8.5	Pathophysiology of higher nervous activity. Neuroses, their types and characteristics /Lec/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
8.6	General etiology and pathogenesis of endocrinopathy. Pathophysiological characteristics of Hypo-and hyperfunction of hypothalamic-pituitary system /Prac/	5	3	PC-5	L1.1 L1.2 L2.1 L2.2	2	Role-play situation game.
8.7	Pathophysiological characteristics of thyroid Hypo-and hyperfunction. Pathophysiological characteristics of Hypo - and hyperfunction of adrenal and sex glands. /Sw/	5	2	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
8.8	Pathophysiology of the nervous system. General etiology and pathogenesis of structural functional disorders of the nervous system. A typical violation of sensory, locomotor and trophic function of the nervous system. The pathophysiology of pain. /Sw/	5	2	PC-5	L1.1 L1.2 L1.3 L2.1 L2.2	0	
8.9	/Exam/	5	18	PC-5		0	
8.10	Pathophysiological characteristics of the Hypo-and hyperfunction of the thyroid gland.Pathophysiological characteristics of Hypo - and hyperfunction of adrenal and sex glands. /Prac/	5	3	PC-5	L1.1 L1.2 L1.3 L2.1 L2.2	0	
8.11	Pathophysiology of the nervous system. General etiology and pathogenesis of structural functional disorders of the nervous system. A typical violation of sensory, locomotor and trophic function of the nervous system. The pathophysiology of pain. /Prac/	5	3	PC-5	L1.1 L1.2 L 1.3 L2.1 L2.2	0	
8.12	Pathophysiology of CNS. Neuroses. The types and their characteristics. The etiology and pathogenesis. /Prac/	5	3	PC-5	L1.1 L1.2 L1.3 L2.1 L2.2	0	
8.13	General etiology and pathogenesis of endocrinopathy. Pathophysiological characteristics of Hypo-and hyperfunction of hypothalamic-pituitary system. /Sw/	5	2	PC-5	L1.1 L1.2 L1.3 L2.1 L2.2	0	
8.14	Pathophysiology of CNS. Neuroses. The types and their characteristics. The etiology and pathogenesis. /Sw/	5	2	PC-5	L1.1 L1.2 L1.3 L2.1 L2.2	0	

5. ASSESSMENT FUND
5.1. Advancement Questions and Assignments
Questions to test the level of learning to KNOW: 11. The main historical stages of pathophysiology worldwide. Scientists who contributed to the development of pathophysiological as science. 2. The main sections of pathological physiology: General nosology, typical pathological processes, pathological physiology of body systems. Their characteristic. 3. Basic concepts and categories of General nosology: health, disease, disease periods. 4. Etiological factors of the disease: definition. Classification, their role at different stages of the disease. Conditions of occurrence of the disease: definition, types, meaning 5. Pathophysiological characteristics of the periods of overheating. The main changes in the function of organs and systems and metabolism during overheating. 6. The factors on which the damaging effect of the electric current depends. 7. Definitions of "cell damage". The main types of cell damage. Exogenous and endogenous factors (causes and conditions of damage) cells. 8. The outcomes of cell damage. Dystrophy, dysplasia, necrosis, apoptosis. 9. Definition of the concepts of reactivity and resistance of the organism. Types and forms of reactivity, their characteristics. Pathological reactivity. 10. Directed change of individual and group reactivity as the most important means of prevention and therapy of diseases. 11. The resistance of the organism, types and their characteristics. Cellular and humoral factors that provide resistance of the body. 12. Definition and General characteristics of allergies. Classification of allergic conditions. 13. Anaphylaxis, stages, characteristics. Sensitization: active and passive. 14. Definition and classification of hereditary forms of pathology. 15. Typical forms of peripheral circulatory disorders. Stasis, types, main causes and mechanisms of development and consequences. 16. Heart attack, species, outcomes. Collateral circulation, types of collaterals, mechanism of development. The value in pathology. 17. Embolism, types of embolism and their characteristics embolism. 18. Definition and General characteristics of inflammation. The etiology of the inflammation. Inflammatory mediators (cellular and humoral) and their role in the development of the inflammatory process. 19. The reasons for the transition of arterial hyperemia in the venous inflammation. Local and common signs of inflammation and mechanisms of their development. 20. Types of exudates and their characteristics. The difference of exudate from transudate (Rivolt test). 21. Definition of the concept and general characteristics of fever as TPP. Etiology of fever. Characteristics of exo- and endogenous pyrogenic substances. Leukocytic (true) pyrogens. 22. Types of fever, depending on the cause, the degree of rise in body temperature and the type of temperature curves. 23. Infectious process, definition, types of infectious process. Forms of relationships between macro- and microorganisms. 24. Kinds of infectious agents and their properties. Conditions for the emergence of the infectious process: the entrance gate, the pathways of the spread of infectious agents, the mechanisms of anti-infectious protection. 25. Stages of infectious diseases, characteristic. Mechanisms of protection of the organism from pathogens of infections: nonspecific (bactericidal and bacteriostatic, cellular and humoral, reflex) and specific. 26. Indicators characterizing the violation of protein metabolism. Nitrogen balance and its disturbances in pathology. 27. Types of starvation and their characteristics. 28. Hyperglycemia - types, causes, mechanisms of development and basic clinical manifestations. 29. The reasons for the violation of digestion and absorption of fats in the gastrointestinal tract. Steatorrhea. Hyperlipidemia, types and mechanisms of development (biochemical indicators).

30. Obesity, species and their characteristics. Factors contributing to the development of alimentary obesity.
31. The main forms of disorder ABB and their characteristics.
32. Types of edema. Etiology and pathogenesis.
33. Definitions of the concept of "tumor growth" and general characteristics of tumors. Etiology of tumors - types of carcinogens and their characteristics.
34. The concept of metastasis. Stages and ways of metastasizing in the body.
35. Definition of the concept and general characteristics of hypoxia and hypoxemia. Etiology and pathogenesis of the main types of endogenous hypoxia: respiratory, circulatory, hemic, tissue, overload, mixed.
36. General etiology and pathogenesis of insufficiency of external respiration.
37. The main causes and mechanisms of impaired diffusion and perfusion ability of the lungs. The main indicators of insufficiency of external respiration and their characteristics.
38. Sinus tachycardia, sinus bradycardia, sinus arrhythmia, types and causes of their occurrence.
39. Extrasystolia (sinus, atrial, atrioventricular, ventricular). Its causes and features of ECG changes depending on the place of origin.
40. The main causes and types of coronary insufficiency (relative and absolute). Stages of coronary insufficiency and their characteristics.
41. Classification and general characteristics of hypertensive states.
42. Fainting, collapse, shock. Types and mechanisms of development, manifestations and consequences.
43. Definition of the concept and classification of forms of circulatory insufficiency.
44. Heart defects, their types and characteristics.
45. Hypertrophy of the myocardium, stages and species: eccentric, concentric. Mechanisms of their development.
46. The main indicators of hemodynamics and their changes in CHF.
47. Changes in total blood: normo-; hypo- and hypervolemia, their types, causes and mechanisms of development.
48. Erythrocytosis: absolute and relative, the causes of the specificity of the etiology and pathogenesis of the true (absolute) polycythemic hypervolemia, a violation of hemodynamics.
49. Definitions of the concept and principles for the classification of anemic states.
50. General characteristics of iron deficiency anemia: chlorosis (early and late), alimentary iron deficiency anemia.
51. The concept of the external and internal factor of Castle (gastromukoprotein) and its role in the pathogenesis of Vit. In 12 and folic deficiency anemia.
52. Etiology and pathogenesis of acquired hemolytic anemia (HA).
53. The main causes of liver failure and signs of its manifestation.
54. Hepatitis, species. Etiology and basic manifestations and consequences.
55. Cholemia. Change in the system of blood, nervous system and cardiovascular system with cholemia.
56. General etiology and pathogenesis of typical forms of pathology of the digestive system. Typical disorders of taste, impaired appetite, salivation and swallowing.
57. Proteinuria, hematuria, types and mechanisms of development.
58. The mechanism of development of renal edema (nephrotic and nephritic) and their difference from cardiac.
59. General etiology and pathogenesis of endocrinopathies.
60. Hypopituitarism, hyperpituitarism, species, pathogenesis and manifestations:
Questions for testing the level of training TO LEARN:
61. The subject, the tasks of pathophysiology. Clinical pathophysiology, its goals and objectives. Its place among other medical sciences, the importance for the clinic.
62. Pathological process, typical pathological process, pathological condition, pathological reaction.
63. Etiology, definition. Preceding theories and modern general theses of etiology.
64. The concept of pathogenesis. The main link and the "vicious circle" in the pathogenesis of disease.
65. Adaptive (protective-adaptive, compensatory) mechanisms are an integral part of pathogenesis. Mechanisms of recovery.
66. External and internal causal factors of disease occurrence, their characteristics, general properties and features.

67. Overheating (hyperthermia) - factors that cause overheating of the body (causes and conditions), mechanisms for the development of hyperthermia.
68. Kinetosis: causes and clinical manifestations. Types of acceleration, the mechanism of action of accelerations on the body. Overloading views.
69. The mechanism of the action of electric current on the body.
70. Typical mechanisms of cell damage.
71. The role of free radicals in cell damage. Peroxide oxidation of lipids.
72. Adaptive and pathogenic value of cell death in normal and pathological conditions.
73. Factors determining reactivity: the role of the genotype, age, sex, constitution. The influence of the external environment, social and environmental factors on the reactivity of the organism.
74. Allergens. Types of allergens and their characteristics.
75. General pathogenesis and stages of allergic reactions.
76. Etiology of hereditary and congenital diseases. Mutagens and their types: exogenous (physical, chemical, biological), endogenous.
77. Mutations and their types. Characteristics of teratogenes.
78. Arterial hyperemia, types, causes, mechanisms of development.
79. Venous hyperemia, the main causes and mechanism of development.
80. Ischemia, types, causes, mechanisms of development.
81. Thrombosis. The main causes and conditions of blood clot formation in blood vessels.
82. Pathogenetic features of air and gas embolism.
83. Sludge. Causes, mechanism of development and consequences.
84. Stages of the inflammatory process (pathogenesis of inflammation). Alteration, species and their characteristics. The significance of primary and secondary alteration in inflammation.
85. Features of metabolic disorders and physico-chemical changes in the focus of inflammation.
86. Phases of vascular reaction in inflammation and mechanisms of their development.
87. Exudation. The importance of vascular and tissue factors in the mechanism of development of exudation. Adaptive and pathogenic importance of exudation in the development of inflammation.
88. Factors on which the type, composition and properties of the exudate depends.
89. Pathogenetic features of acute and chronic inflammation.
90. Pathogenesis of fever (change of set point).
91. Stages of fever. The relationship between heat production and heat transfer in various stages of fever. Critical and lytic temperature decrease.
92. Difference of fever from overheating.
93. Violation of basal metabolism in diseases of the thyroid gland, anemia and chronic heart failure.
94. Hyperproteinemia, hypoproteinemia - causes and consequences.
95. Factors affecting the duration of fasting. Fasting, as a method of treatment. Dietotherapy.
96. Hypoglycemia and hypoglycemic syndrome - types, causes, mechanisms of development and basic clinical manifestations.
97. Glucosuria - species, causes and mechanisms of development. Renal diabetes.
98. Etiology, pathogenesis and the main manifestations of diabetes insipidus.
99. Experimental forms of diabetes mellitus (pancreatic, alloxan, and floridazine).
100. Disturbance of interstitial metabolism of fat in diabetes mellitus. Hyperketonemia (ketosis), causes and mechanisms. Ketonuria.
101. The main causes and characteristics of endocrine obesity.
102. Etiology and pathogenesis of alimentary obesity.
103. Consequences of obesity. Violations of the functions of organs and systems for obesity.
104. Atherosclerosis, the definition of a concept, a general characteristic. General etiology and pathogenesis of atherosclerosis.
105. Gas acidosis and gas alkalosis. Causes and mechanisms of development.
106. Negative alkalosis and a negative acidosis. Causes and mechanisms of development.
107. Typical forms of water balance disturbance: hypo- and hyperhydration, species, etiology and pathogenesis.
108. Hypo-and hypernarthriemia. Causes and consequences.
109. Hypo-and hyperkalemia. Causes and consequences.
110. Hypo-and hypercalcemia. Causes and consequences.
111. Classification of tumors. The difference between benign tumors and malignant tumors.

112. Stages of tumor development (carcinogenesis) and their characteristics. The concept of proto-oncogenes, oncogenes, oncoproteins and their role in the cellular and molecular mechanisms of carcinogenesis.
113. Disturbance of metabolism and physiological functions in acute and chronic hypoxia.
114. Hypoxia - as a universal mechanism of damage and cell death.
115. Urgent and long-term adaptation mechanisms for hypoxia.
116. Hypoxic hypoxia: hypobaric and normobaric, hyperbaric - causes and mechanisms of development.
117. The main causes and mechanisms of violation of alveolar ventilation of the lungs (alveolar hypoventilation, alveolar hyperventilation).
118. Etiology and pathogenesis of pulmonary hypertension (precapillary, postcapillary, mixed).
119. Shortness of breath and its kinds. Causes and mechanisms of their development (Goring-Breyer reflex).
120. Periodic and terminal types of respiration (Biots, Chain-Stokes, Kussmaul, etc.). Causes and mechanism of their development.
121. Pathogenesis and consequences of paroxysmal tachycardia.
122. Pathogenesis of the main clinical manifestations of myocardial infarction: pain and resorptive-necrotic syndrome.
123. The significance of atherosclerosis and other risk factors in the mechanism of development of coronary insufficiency (atherogenic and lipotropic factors).
124. Hypertensive disease. Etiology and pathogenesis, risk factors of hypertensive disease.
125. Stages and main clinical manifestations of hypertension, and mechanisms for their development. Complications and consequences of hypertension.
126. Secondary (symptomatic) arterial hypertension, their types, causes and mechanisms of development.
127. Pathophysiological characteristics of chronic arterial hypotension: primary, secondary (symptomatic). Etiology and pathogenesis.
128. Pathogenetic classification of CHF (overload of blood volume, resistance overloading).
129. Compensation mechanisms for heart defects (urgent and non-urgent): isotonic and isometric hyperfunction of the heart, tonogenic and myogenic dilatation and their characteristics.
130. The mechanism of the transition of compensated defects to decompensated ones.
131. Metabolic disorders in CHF.
132. Causes of death and factors that determine the consequences of acute blood loss.
133. Compensation mechanisms for acute blood loss (blood loss phase). Mechanism of bone marrow phase of compensation in acute blood loss. Features of blood regeneration in case of blood loss in high altitude conditions.
134. Hypercoagulation. Thrombotic syndrome. The main causes and mechanisms of development, manifestations and consequences.
135. Hypocoagulation. Hemorrhagic syndrome. The main types, causes, mechanisms of development, manifestations and consequences.
136. Etiology and pathogenesis of iron deficiency anemia.
137. Etiology and pathogenesis vit.B12 and folic deficiency anemia.
138. The pathogenesis of the triad of symptoms in Vit.B12 and folic deficiency anemia.
139. Thalassemia. Etiology and pathogenesis. The picture of blood and the main clinical manifestations.
140. Sickle-cell anemia. Etiology and pathogenesis and basic clinical manifestations.
141. Etiology and pathogenesis, types of pathological leukocytosis: the mechanism of development, the change in the leukocyte formula.
142. Neutrophilous leukocytosis. Causes and mechanisms of development.
143. Eosinophilic and basophilic leukocytosis. Causes and mechanisms of development.
144. Leukopenia, types, causes and mechanisms of development. Agranulocytosis, species. Etiology and pathogenesis. The picture of blood and the consequences.
145. Definition of concept and common characteristic and principles of leukemia classification. The concept of monoclonal and polyclonal leukemia.
146. Signs of tumor progression in leukemia. The concept of "leukemia gaping", "blast crisis", aleukemic and leukemia leukemia phases.

147. General characteristics and pattern of blood in acute myeloid (AML) and lymphoblastic leukemia (ALL).
148. General characteristics and pattern of blood in chronic myelocytic leukemia (CML).
149. General characteristics and pattern of blood in chronic lymphocytic leukemia (CLL).
150. Etiology and pathogenesis, general characteristic and picture of blood in Vaquez disease.
151. Violation of the barrier and detoxification of the liver.
152. Cirrhosis of the liver, species. Etiology and pathogenesis. The consequences of the development of liver cirrhosis.
153. Disturbance of metabolism in liver failure.
154. Jaundice. Types and their characteristics:
155. Portal hypertension. Types, causes, the main manifestations of its consequences.
156. Types of disorders of gastric secretion: hypersecretion, hyposelection and achilles. The main causes and consequences.
157. Typical forms of impaired motor function of the stomach. The main causes and consequences.
158. Typical forms of impaired motor function of the intestine: diarrhea and constipation. The main types and mechanisms of occurrence and consequences.
159. General etiology and pathogenesis of intestinal diseases: malabsorption syndrome, chronic enteritis, chronic colitis and irritable bowel syndrome. Its main clinical manifestations.
160. Etiology and pathogenesis of peptic ulcer of the stomach and duodenum. Its main manifestations and complications.
161. Nephrosis and nephrotic syndrome (primary and secondary). The main causes and manifestations.
162. Pathophysiological characteristics of chronic diffuse glomerulonephritis (CDH), and pyelonephritis.
163. Definition of the concept and basic indicators of renal failure.
164. Etiology and pathogenesis of acute renal failure (ARF).
165. Etiology and pathogenesis of chronic renal failure (CRF).
166. Stages of chronic renal failure and their pathophysiological characteristics.
167. The main causes of violations of the central mechanisms of regulation of peripheral endocrine glands (violation of transhypophysial regulation, violation of parahypophyseal regulation, the role of disturbances in the feedback mechanism.
168. Etiology of primary disorders of peripheral endocrine gland function (disruption of biosynthesis and hormone secretion).
169. Etiology and pathogenesis of peripheral (extragranular) forms of endocrine disorders.
170. Pathological characteristics of the hypo- and hyperfunction of the anterior lobe of the pituitary gland. The mechanism of the violation of protein, carbohydrate and fat metabolism in the case of hypersecretion of growth hormone (STH).
171. General etiology, pathogenesis and the main manifestations of hypothyroidism: myxedema, cretinism.
172. Endemic goiter. Etiology and pathogenesis, pathophysiological characteristics of the main manifestations. The role of autoimmune and environmental factors in the development of endemic goiter.
173. General etiology and manifestations of hyperthyroidism. Pathogenesis of metabolic disorders and changes in the functions of organisms and systems in diffuse toxic goiter (Basedova disease).
174. Etiology pathogenesis of adrenogenital (corticogenital) syndrome , and its main types and manifestations (virilism-masculinization and feminization).
175. The general etiology and pathogenesis of violations of the endocrine function of sexual glands and their main manifestations: hypogonadism, eunuchoidism, hypergonadism.
176. General etiology, pathogenesis of disorders of the nervous system (damage to neurons, violation of inter-neuronal interactions, disorder of integrative activity).
177. Etiopathogenesis of disorders of the locomotor function of the nervous system: hypo- and hyperkinesia, hypodynamia, ataxia - disorders of coordination of movements.
178. Etiopathogenesis of neurogenic sensitivity disorders: anesthesia and hypesthesia, hyperesthesia and dysesthesia.
179. Pathological pain of peripheral and central origin: thalamic, phantom and causal.
180. Disturbance of the autonomic nervous system, damage to the hypothalamus, sympathetic and parasympathetic innervation. Vegetative neuroses and their characteristics.
Questions (tasks) for testing the level of training SKILLS:

181. Methods of pathological physiology. Experiment as the main method of pathophysiology. Importance of the experiment. Types and stages of the experiment.
182. Signs of the disease. Nature of the course of the disease. Relapses, remissions. Outcomes and complications of the disease.
183. Pathogenic effect of the thermal factor. Burns, types and degrees of burns and their characteristics.
184. Burn disease, clinical stages and their pathophysiological characteristics. The pathogenesis of burn shock.
185. Pathogenesis of heat and sun stroke, pathogenetic principles of first aid.
186. Etiology and pathogenesis of the development of type I allergic reactions by Gell and Coombs. Clinical forms.
187. Characteristics of allergens, mediators and mechanisms of development of cytotoxic and cytolytic allergic reactions of type II according to Gell and Coombs, their role in pathology. Clinical forms.
188. Characteristics of allergens, mediators and mechanisms of development of immunocomplex allergic reactions of type III according to Gell and Coombs, their role in pathology. Clinical forms.
189. Characteristics of allergens, mediators and mechanisms for the development of type IV allergic reactions according to Gell and Coombs, their role in pathology. Clinical forms.
190. Pathogenesis of anaphylactic shock in humans. Features of the course of experimental anaphylactic shock in guinea pigs, dogs and rabbits.
191. Desensitization, hyposensitization. General principles of diagnosis, prevention and treatment of allergic diseases.
192. Methods of diagnosis of hereditary diseases (demographic, genealogical, twin method, cytogenetic, biochemical, immunological method, dermatoglyphic, experimental).
193. Signs and consequences of arterial and venous hyperemia.
194. Signs and consequences of ischemia
195. Stages and mechanisms of thrombus formation in blood vessels. The fate of the thrombus and the consequences of thrombosis.
196. Features of the etiology, pathogenesis and course of embolism of the pulmonary artery and portal vein. Thromboembolic disease, etiology and pathogenesis.
197. Stages and mechanisms of emigration of leukocytes to the focus of inflammation. The role of leukocyte emigration in the development of the inflammatory process.
198. Features of metabolism, changes in the function of organs and systems in various stages of fever.
199. Meaning of a febrile reaction for the body. Pathogenetic principles of antipyretic therapy. Pyrotherapy.
200. Mechanism of development of protein-free edema (Crogh-Starling scheme).
201. Hypazotemia - types and mechanisms of development.
202. Disturbance of metabolism and changes in the functions of organs and systems during fasting, depending on the stage and periods of fasting.
203. Clinical forms of protein-energy deficiency - alimentary dystrophy (alimentary marasmus) and kwashiorkor.
204. Etiology and pathogenesis of diabetes mellitus (type 1 diabetes and diabetes mellitus type 2).
205. Disturbance of metabolism in diabetes mellitus. Main clinical and biochemical manifestations of diabetes mellitus and their mechanism of development.
206. Pathogenesis of acute (early) and chronic (late) complications of diabetes mellitus. Differentiation of com with diabetes mellitus.
207. The role of violations of fat metabolism in the development of atherosclerosis. Modern ideas about the pathogenesis of atherosclerosis.
208. Modern theories of carcinogenesis.
209. Features of growth and metabolism of tumor tissue. Effect of tumor on the body. The concept of paraneoplastic syndrome. Pathogenesis of cancer cachexia.
210. Etiology and pathogenesis of mountain sickness. The difference between mountain sickness and altitude.
211. Primary pulmonary and primary-extrapulmonary forms of external respiratory failure. Etiology and pathogenesis of obstructive and restrictive types of disturbance.
212. Etiology and pathogenesis of respiratory and circulatory disorders in bronchial asthma and pulmonary emphysema.
213. Etiology and pathogenesis of respiratory and circulatory disorders in pneumonia and pulmonary edema, including alpine ones.

214. Etiology and pathogenesis of respiratory and circulatory disorders in various types of pneumothorax.
215. Blockade of the heart, types and mechanisms of development. The period of Venkenbach-Samoilov and the peculiarities of the IV degree of atrioventricular blockade.
216. Pathogenesis of atrial fibrillation (ventricular fibrillation).
217. Complications and outcomes of angina pectoris and myocardial infarction. Pathogenesis of cardiogenic shock, clinical manifestations.
218. Pathogenesis of renal arterial hypertension (the theory of Goldblatt and Grollman).
219. Clinical (subjective and objective) manifestations of Chronic renal failure and mechanisms of their development.
220. Mechanisms of cardiac edema development and their difference from renal.
221. Pathological forms (regenerative and degenerative) of red blood. Reticulocytes and their importance for understanding the pathogenesis of various forms of anemia.
222. Picture of blood in acute posthemorrhagic anemia, depending on the period of blood loss.
223. DIC is a syndrome. Etiology and pathogenesis, stages, manifestations and consequences. Pathogenetic principles of therapy and prevention of DIC syndrome.
224. The picture of blood in iron deficiency anemia.
225. The picture of blood and features of hematopoies in Vit.B12 and folic deficiency anemia.
226. Shifts of the leukocyte formula to the left and to the right with neutrophilic leukocytosis, pathophysiological characteristics and significance for understanding the reactivity of the organism in pathology.
227. Leukemoid reactions, types, causes and mechanisms of development and their difference from leukemia.
228. The pathogenesis of leukemia (clone theory) in the light of modern concepts. Features of metastasis of tumor cells in leukemia.
229. The mechanism of development of secondary clinical manifestations in leukemia: anemic, hemorrhagic, intoxication, infectious, metastatic syndromes.
230. Pathogenesis of the hepatic coma and its main manifestations.
231. Experimental reproduction and study of liver function insufficiency (complete and partial removal of the liver, angiostomy by London, fistula Ekka -Pavlova (direct and indirect)).
232. Methods of differentiation of jaundice (direct and indirect bilirubin, stercobilin and urobilin).
233. Change in daily diuresis and relative density of urine: polyuria, oliguria and anuria, hypo- and isostenuria of their cause and diagnostic significance.
234. Pathogenesis of uremia and uremic (kidney) coma and its main manifestations.
235. Etiology and pathogenesis of hypercortisolism. The main manifestations of the syndrome and Diseases of Itsenko-Cushing and the mechanisms of their development.
236. Etiology and pathogenesis of chronic insufficiency of the adrenal cortex (Addison's disease), its main manifestations and mechanisms of development.
237. Pathophysiology of pain. The concept, a general characteristic of pain: physiological and pathological. Biological and pathogenic significance of pain.
238. Violation of the trophic function of the nervous system. Neurodystrophy and denervation syndrome. Main manifestations and mechanism of development.
239. Consequences of complete and partial removal of the cerebral cortex. The value of protective braking and its application in the clinic.
240. Mechanisms of the occurrence of the functions of CNS. Neuroses, concept, types, characteristics. Etiology of neuroses, manifestations in humans. The role of features of CNS in the emergence and development of neuroses.

5.2. Course Papers Themes

5.3. Assessment Fund

1. Test: Appendix 1
2. Situational tasks: Appendix 2
3. The report

1. Examples of Tests:

1. For the hypobaric form of exogenous hypoxia, the characteristic is:

1. hyperoxia;

2. hypocapnia;

3. high arterio-venous difference in oxygen;
4. reduction of blood oxygen capacity.
2. The size of the blood oxygen capacity depends on:
1. the quantity and quality of hemoglobin
2. partial pressure of oxygen in arterial blood
3. oxygen partial pressure in venous blood
4. CO2 partial pressure in arterial blood
3. Hypocapnia is:
1) an increase in paCO2 more than 40 mm Hg;
2) a decrease in PAC0 less than 36 mm. Hg;
3) an increase in CO2 of more than 44 mm Hg;
4) reduction of CO2 less than 30 mm Hg.
4. Pathogenetic factor of exogenous hypoxia?
1) lowering the partial pressure of O2 in the air we breathe
2) pulmonary insufficiency
3) carbon monoxide poisoning
4) cyanide poisoning
5. Causes of hemic hypoxia:
1) carbon monoxide poisoning;
2) cyanide poisoning;
3) with heart failure;
4) with stagnation of blood in the lungs.
6. The urgent compensation mechanisms for hypoxia include:
1) hyperventilation
2) myocardial hypertrophy
3) exit of blood from the depot
4) increased hemopoiesis

2. Situational Task № 1

Patient A. was admitted to the hospital with severe cyanide poisoning.

Tasks and questions:

1. Explain the pathogenesis of this type of hypoxia referred to in patient A.? What are the typical changes in the gas composition and blood pH during hypoxia of this type?

Standard of answer:

Patient A. has tissue hypoxia. The pathogenesis of this type of hypoxia lies in the specific inhibition of the activity of enzymes of biological oxidation. In case of cyanide poisoning, cyanide ions (CN–) prevent the oxidation of cytochrome. As a result, the restoration of iron in the respiratory enzyme and the transport of oxygen to cytochrome is blocked. In this case, tissue respiration reactions activated by other agents (not containing iron) are not inhibited. However, the effectiveness of these reactions is very small and does not prevent the development of hypoxia and impairment of vital activity. Typical changes in the gas composition and blood pH during tissue hypoxia:

• Increased oxygen partial tension in venous blood.
• Increased Hb saturation with oxygen in venous blood.
• Increase the volume of oxygen in venous blood.
• Normal pO2, SO2 and VO2 range in arterial blood.
• Decreased arteriovenous oxygen difference.
• Non-gas acidosis.

3. Themes of the reports:

1. The main historical stages of development of pathophysiology in worldwide.

2. Bases of etiotropic, pathogenetic, preventive and symptomatic therapy.
3. The role of the constitution in the development of human pathology.
4. The role of social factors in the development of pathology.
5. Radiation damage - types, causes, pathogenesis and consequences for the body.
6. Features of biological barriers, immune, nervous and endocrine systems in the formation of the body's response to damage.
7. Peroxide oxidation of lipids (LPO). The importance of LPO in the development of individual human diseases (atherosclerosis, ischemic heart disease, impaired immunity, tumors, etc. at the discretion of the student).
8. Pro- and antioxidant systems of the cell. Value in norm and pathology.
9. The role of free radical and peroxide reactions in the pathogenesis of cell damage and human diseases.
10. The main causes, mechanisms of development and consequences of damage to cellular receptors.
11. Hereditary diseases. Causes, mechanisms of development, principles of prevention.
12. Chromosomal diseases. Causes, mechanisms of development, principles of prevention.
13. Congenital diseases. Causes, mechanisms of development, principles of prevention.
14. Mutations and their role in the development of human pathology.
15. Etiology, pathogenesis, principles of prevention and treatment of decompression pathology.
16. The main causes, mechanisms and consequences of violations of the permeability of the vascular wall.
17. Biological essence of inflammation.
18. Inflammation. Formation in evolution, acute inflammatory reaction and immunity.
19. Influence of the neuro-endocrine system on the course of the inflammatory process in the body.
20. Analysis of factors determining the features of the course and outcome of the inflammatory process.
21. Pathophysiological aspects of development of infectious-toxic shock, sepsis.
22. Characteristics of factors contributing to the chronic infection of acute infectious diseases.
23. The role of the immune and nervous systems in the development of fever.
24. Complications caused by fever (types, causes, mechanisms, manifestations, ways of warning).
25. Pyrotherapy: pathophysiological justification and application in modern medicine.
26. Etiology, general links of pathogenesis and clinical significance of immunopathological conditions.
27. Importance of immune auto-aggressive mechanisms in the chronicization of acute pathological processes.
28. Characteristics of factors that cause allergic reactions and conditions that predispose to their occurrence.
29. Sources of allergization in the modern world.
30. Pseudoallergies. Clinical manifestations, pathogenetic differences from true allergies.
31. Immunodeficiencies of cellular immunity.
32. Immunodeficiencies of the humoral immunity .
33. Immunological aspects of transplantation.
34. Importance of immunopathological mechanisms in the development of somatic diseases.
35. Features of the course of diseases in low, medium and high mountains.
36. Pathogenesis of hypoxia in hypo- and avitaminosis.
37. Features of etiopathogenesis of alpine cerebral edema.
38. Causes, mechanisms of development, basic manifestations and principles of the prevention of altitude sickness.
39. Causes, mechanisms of development, main manifestations and principles of prevention of mountain sickness.
40. Pathophysiological analysis of complications of hyperbaric oxygenation.
41. Hyperoxia: causes; mechanisms of its adaptive and pathogenic consequences.
42. Pathophysiological aspects of hereditary disorders of amino acid metabolism.
43. Gout. The role of exo- and endogenous factors in its occurrence. Mechanisms of development. Pathogenetic treatment.
44. Mechanisms of positive effects and possible complications of curative fasting.
45. Mechanisms of infringements of anti-infective resistance of an organism at a diabetes.
46. Disorders of carbohydrate metabolism in hereditary enzyme deficiency.
47. Causes, mechanisms of development and consequences of hypercholesterolemia.

48. Atherosclerosis. Modern view on the causes and mechanisms of development.
49. The significance of the hereditary factor in the pathogenesis of atherosclerosis.
50. Obesity, causes, mechanisms of development, consequences.
51. Metabolic syndrome - causes, pathogenesis and consequences. Insulin resistance as a trigger factor in the development of metabolic syndrome.
52. The value of ions K +, Na +, Mg2 +, Ca2 + and trace elements in the body. Causes and mechanisms of ion homeostasis disturbance.
53. Etiology, pathogenesis and consequences of metabolic disorders of microelements in the body.
54. Features of the disturbance of water metabolism in diseases of the cardiovascular system, kidneys.
55. Pathogenesis of certain types of edema (cardiac, renal, toxic, inflammatory, allergic, endocrine, etc.).
56. Etiology, pathogenesis, manifestations and consequences of hypervitaminosis.
57. Pathogenesis of coma and convulsive syndromes in severe forms of alkalosis.
58. Pathogenesis of coma and convulsive syndromes in severe forms of acidosis.
59. Mixed diversified and unidirectional changes in CBS.
60. Synthesis of oncoproteins as a mechanism for the formation of tumor atypism.
61. Modern concepts of carcinogenesis.
62. Natural anti-malignant mechanisms of the body and prospects for their activation for the prevention and treatment of malignant tumors.
63. Immune reactions of antiblastic resistance of the organism, causes and mechanisms of suppression of their activity in the development of malignant tumors.
64. Possible mechanisms of spontaneous regression ("self-healing") of malignant tumors.
65. Paraneoplastic syndromes.
66. Causes and pathogenesis of certain types of shock (pain, hemorrhagic, cardiogenic, traumatic, etc.).
67. Features of the pathogenesis of toxic, septic, hypovolemic shock.
68. The concept of the syndrome of prolonged compression. Its causes and the main pathogenetic mechanisms.
69. Spinal shock - causes and mechanisms of development.
70. Heart failure: etiology, pathogenesis, manifestations, diagnostic methods, principles of prevention and treatment.
71. Congenital heart diseases - features of intracardiac hemodynamics and the pathogenesis of clinical manifestations.
72. Acquired heart diseases - features of intracardiac hemodynamics and the pathogenesis of clinical manifestations.
73. Myocardial remodeling in heart failure: a characteristic of the process, its main causes, mechanisms of formation, consequences, methods of drug correction.
74. Hypertrophy of the myocardium as a mechanism of compensation, the prerequisites of failure.
75. Features of etiopathogenesis of myocardial infarction.
76. Non-coronary heart necrosis.
77. Ischemic heart disease: the main causes, pathogenesis, manifestations, principles and methods of diagnosis, treatment and prevention.
78. The importance of the phenomenon of reperfusion in acute coronary insufficiency.
79. Adapting the heart to hypoxia in acute coronary insufficiency.
80. Heart damage in endocrine disorders.
81. Cardiac arrhythmias: types, etiology, pathogenesis, consequences, principles and methods of treatment and prevention.
82. Pressor and depressor factors of the body. Value for the pathogenesis of arterial hypertension.
83. Renin-angiotensin-aldosterone system (RAAS) - functioning in the norm, with adaptive reactions of the body and in the process of development of renal arterial hypertension
84. The role of calcium ions in the pathogenesis of arterial hypertension.
85. Causes, mechanisms and role of remodeling of the heart and vessel walls in the development of arterial hypertension.
86. Bronchobstructive syndrome, causes and pathogenesis of respiratory failure.
87. Causes and pathogenesis of respiratory failure with restrictive disorders.
88. Bronchial asthma - causes and pathogenesis of respiratory failure.
89. Emphysema of the lungs - causes and pathogenesis of respiratory failure.
90. Thromboembolism of the pulmonary artery (PE) - causes and pathogenesis of respiratory failure.

91. The role of the surfactant system in lung pathology.
92. The importance of hypo- and hypercapnia in pathology.
93. Etiology, pathogenesis and principles of pulmonary edema therapy.
94. The role of Fe2 + in the body. Iron deficiency states.
95. Internal and external factors of the Castle, their role in the development of anemic conditions.
96. Aplastic anemia. Syndrome of bone marrow failure.
97. Hemolysis of erythrocytes: types, causes and mechanisms of development, main manifestations and consequences.
98. Artificial oxygen carriers: principles of development, application prospects, negative side effects.
99. Violation of the mechanisms regulating the blood coagulation system. The role of the coagulation and anticoagulation system.
100. Etiology, pathogenesis and features of manifestations of various types of thrombocytopathy.
101. Main causes, mechanisms of development and consequences of hemostasis disorders.
102. The significance of platelets, violation of vascular-platelet hemostasis, causes, pathogenesis of hemorrhagic syndrome.
103. Violation of coagulation hemostasis, causes, pathogenesis of hemorrhagic syndrome.
104. Pathogenesis of hereditary forms of hemorrhagic syndrome.
105. The role of the endothelium, causes, pathogenesis of bleeding during hemorrhagic vasculitis.
106. Etiology, pathogenesis, main manifestations and consequences of disseminated intravascular coagulation.
107. "Coagulopathy of consumption" - conditions of occurrence, mechanisms of development, consequences.
108. The role of the genetic factor in the etiology and pathogenesis of hemoblastoses.
109. Pathogenesis of reducing the anti-infective resistance of the organism in leukemia.
110. Importance of the infectious factor in the development of the pathology of the digestive system.
111. Violation of the membrane digestion. Hereditary enzymopathy.
112.Evenous disease. Modern view on the causes and mechanisms of development.
113. Malbosorption syndrome is a pathophysiological basis for clinical manifestations.
114. Hepatotropic poisons: species, chemical characteristics, mechanisms of action on hepatocytes.
115. Pathogenesis of hemostasis disorders in liver pathology.
116. The role of immunoallergic mechanisms in the development and development of renal pathology.
117. Compensatory processes in the kidneys with chronic diffuse glomerulonephritis.
118. Kidney stone disease. Modern aspects of etiopathogenesis.
119. The importance of hemodialysis in the treatment of arthritis, its principles.
120. Uremia. Pathogenesis. Principles of therapy.
121. Importance of violations of transport mechanisms, excretion and peripheral metabolism of hormones in the origin of endocrinopathies.
122. Etiology and pathogenesis of "peripheral" (extragranular) forms of endocrine disorders.
123. Importance of immune auto-aggressive mechanisms in the onset of hypo- and hyperthyroidism.
124. Causes and mechanisms of development of sexual glands disorders: violation of sexual differentiation (Kleinfelter syndrome, Shereshevsky-Turner syndrome).
125. Disorders of sexual development in girls and sexual function in women (premature puberty, delayed puberty, hypo- and hyperfunction of the ovaries). Pathogenesis, the main clinical manifestations.
126. Violations of sexual development in boys and sexual function in men (premature sexual development, delayed sexual development). Pathogenesis, the main clinical manifestations.
127. Neuroses as a condition of a pre-illness.
128. The role of neuroses in the development of psychosomatic diseases.
129. Violation of the trophic function of the nervous system.
130. Modern ideas about nervous trophy and neurodystrophies.
131. Pathological reflexes: origin, species, significance in the development of pathology.
132. Consequences of complete and partial removal of the cerebral cortex.
133. Hypoxic and ischemic brain damage.
134. Alteration of the brain in hypoglycemia. Violations of the acid-base state and function of the brain.
135. Disorders of CNS functions with changes in electrolyte blood composition, insufficiency of other organs (kidneys, liver)

136. Modern theories of pain (neurochemical mechanisms, the theory of gate control, the theory of generator and systemic mechanisms of pathological pain).
137. Etiology and pathogenesis of pathological forms of pain.
138. Pain. Causes, mechanisms of perception of pain, significance in pathology.
139. Endogenous mechanisms of pain suppression. Pathophysiological basis of anesthesia.
140. The general biological significance of the general adaptation syndrome.
141. Stress. Adaptive and pathogenic importance of stress. The concept of "adaptation diseases".
142. Stress: characteristics, stages, general mechanisms of development, role in the development of pathological processes.
143. Stress as a cause of pathology.
144. Alcohol dependence, tolerance and abstinence. Mental and somatic disorders in alcoholism.
145. Analysis of biological and social factors that contribute to the development of substance abuse, drug addiction, alcoholism.
146. Pathophysiology of the formation of states of predilection, mental and physical dependence in substance abuse, drug addiction, alcoholism.
147. Mechanisms of the onset of disorders in conditions of abstinence.
148. Pathogenesis of somatic pathology in chronic alcoholism.
149. Biological rhythms and pathology of man.
150. Weather, health and diseases (meteopathology and ways to prevent it).
151. Analysis of common links in the pathogenesis of various comatose conditions.
152. Stages and mechanisms of the process of organism dying.
153. Analysis of the causes and consequences of post-resuscitative pathology, the ways of its prevention and treatment.

5.4. List of Assessment Tools

1. Test
2. Situational tasks
3. The report
4. Summary
5. Presentation.

Scale of assessment:
1. Tests. Criteria for evaluating tests.
In each version of 10 tests, one question is one answer.
Scale of assessment in points:
1 or no errors 100-86 points
2-3 errors of 85-71 points
4-5 errors 70-60 points
6 or more errors 59-45 points - did not master the material
2. Criteria for assessing the solution of a situational problem.
Criteria of evaluation Scale of evaluation
• demonstrated the ability to analyze information (completely, partially, fragmentarily);
• demonstrated the ability to synthesize
• new information (completely, partially, fragmentarily);
• explanations and reasoned conclusions are made on the basis of interpretation of information (complete, incomplete, fragmented); causal relationships have been established, regularities have been revealed (completely, partially, fragmentarily, etc.)
"100-86" if the task is completed with the error;
"85-71" if the assignment is filled with a full of insignificant errors;
"70-60", if most of the task is completed, but with gross errors (fragmentary, incomplete);
"59-45" points - did not master.
3. Abstract. Report. Criteria for the evaluation of the abstract and the report.
The limit of the duration of control: Protection: 10 minutes speech and answers to questions.
Evaluation criteria (actual abstract and defense text):
• information sufficiency;

• compliance of the material with the topic and the plan;
• the presence of a logical structure for constructing the text (introduction with the formulation of the problem, the main part divided by the basic ideas, the conclusion with the conclusions obtained as a result of reasoning);
• Style and language of presentation (expedient use of terminology, explanation of new concepts, brevity, logic, correctness of application and citation design, use of professional terms, quotations, stylistic construction of phrases, etc.);
• the adequacy and number of sources used;
• the presence of a strong own position;
• adequacy of arguments in the substantiation of a personal position;
• aesthetic design of the work (accuracy, text formatting, highlighting, etc.)
Scale of assessment in points:
"100-86" in full;
"85-71" with minor flaws;
"70-60" partially, but not with actual errors
"59-45" points - did not fulfill
4. Criteria for evaluating the presentation.
Limit of duration of control. Protection: 7-10 minutes speech and answers to questions.
Evaluation criteria (actual presentation and protection):
• information sufficiency;
• compliance of the material with the topic and the plan;
• the presence of a logical structure for constructing the text (introduction with the formulation of the problem, the main part divided by the basic ideas, the conclusion with the conclusions obtained as a result of reasoning);
• The style and language of the presentation (the expedient use of terminology, clarification of new concepts, conciseness, logic, correctness of the use and design of the text in slides, use of professional terms, citations, stylistic construction of phrases, etc.);
• the adequacy and number of sources used;
• the presence of a strong own position;
• adequacy of arguments in the substantiation of a personal position;
• aesthetic design of the work (accuracy, text formatting, selection, use of charts, graphs, photos and drawings, tables, etc.). Scale of assessment in points:
"100-85" in full;
"84-76" with minor deficiencies;
"75-60" partially, but not with actual errors;
"59-45" points - did not master.

6. COURSE (MODULE) METHODOLOGICAL AND INFORMATIONAL SUPPORT			
6.1 Recommended Reading			
6.1.1 Required Reading List			
	Authors, Compliers	Title	Book publisher, Year
L1.1	Abdukarimova E.E., Kakeev B.A.	General pathophysiology	KRSU, 2024
L1.2	Harsh Mohan	«Textbook of pathology»	2019
L1.3	Kaplan	USMLE Lecture notes «Pathology»	2018
L1.4	Robbins and Cotran.	«Basic pathology» 11th edition	2023
6.1.2 Advanced Reading			
	Authors, Compliers	Title	Book publisher, Year
L2.1	Hussain A. Sattar	«Fundamentals of pathology medical course and step one review»	Chicago - 2018
L2.2	Ramadas Nayak	«Exam Preparatory manual for undergraduates»	2017
6.1.3 Guidance Papers			
	Authors, Compliers	Title	Book publisher, Year
L3.1	Ilyina L.L., Jylkichieva Ch.S.,	General Nosology. Typical pathological processes.(Part I,II)	Bishkek: Published by IMS 2016

6.2 Online Resources
Электронная библиотека КРСУ - https://lib.krsu.kg/index.php?name=search
1 С - https://krsuniversity.sharepoint.com/SitePages/ITHelpdeskHome.aspx?ga=1
MicroSoft Teams - https://teams.live.com
ИАИС - https://iais.krsu.kg/auth
https://lib.krsu.kg/uploads/files/public/12933.pdf
https://drive.google.com/file/d/1xWPVej3J7QDg2ICVL6FayqsAj1Aiezna/view
https://www.academia.edu/68598323/Robbins_Basic_Pathology_10th_Edition
https://medstudentscorner.com/download-harsh-mohan-pathology-pdf-latest-edition-review/
https://drive.google.com/file/d/1gYeQXjcFNKx4Ijo59OWidFFCgvHAZHNb/view
https://drive.google.com/file/d/1di5wVkkcrH_XTEo7ucWMyvz-s_cLT1w6/view
https://www.elsevier.com/books/robbins-and-cotran-pathologic-basis-of-disease/kumar/978-0-323-53113-9
6.3. List of Information and Education Technologies
6.3.1 Competence-based Educational Technologies
6.3.1.1 Traditional educational technologies - lecturing on streams, practical classes in groups. 6.3.1.2 Innovative educational technologies - lectures with multimedia presentation of information. In practical exercises: interpretation of clinical and laboratory data on the basis of etiopathogenesis in role-playing situational games and trainings, and solution of situational problems in the form of a discussion. 6.3.1.3 Information educational technologies - independent use by the student of computer equipment and Internet resources for performance of practical tasks and independent work - preparation of abstracts, reports, presentations.
6.3.2 List of Information Reference Systems and Software
6.3.2.1 https://lib.krsu.kg/index.php?name=search 6.3.2.2 Information retrieval systems: Medline, PubMed, Web of Science. 6.3.2.3 Information system "Single window of access to educational resources" (http:/windou,edu. ru). 6.3.2.4 Methodical materials on the site of the department (http://physiolog.krsu.edu.kg) on the university server. 6.3.2.5 https://krsuniversity.sharepoint.com/SitePages/ITHelpdeskHome.aspx?ga=1 6.3.2.6 https://iais.krsu.kg/auth 6.3.2.7 https://teams.live.com

7. COURSE (MODULE) LOGISTICS
7.1 Educational audiences. 7.2 Lecture room for lectures for 50 seats, in it: multimedia complex (laptop, projector, screen), interactive whiteboard. 7.3 Audience for experimental work "Laboratory of Experimental Modeling of Pathological Processes". In it: a refrigerator, a thermostat, a distiller, laboratory scales, a microscope, an electrocardiograph, a drying cabinet, a set of instruments (surgical scissors, different tweezers, clamps, etc.), a set of chemical vessels (test tubes, flasks, pipettes, etc.) for fixing animals, pulse oximeter, pressure chamber, glucometer, flame photometer, coagulograph, thermostat, coagulometer. 7.4 Vivarium. 7.5 Video films.

8. COURSE (MODULE) PROFICIENCY METHODICAL GLUIDELINES (FOR STUDENT)
1. Technological map. Annex 3 In preparing for practical classes, performing laboratory work and for independent work (CDS) on various topics, the following textbooks and teaching aids should be used. Main literature. 1. Abdukarimova E.E., Kakeev B.A. “General pathophysiology” KRSU, 2024 2. Harsh Mohan «Textbook of pathology» 2019

3. Kaplan USMLE Lecture notes «Pathology» 2018
2. Robbins « Basic pathology 11th edition » 2023
3. Ramadas Nayak « Exam Preparatory manual for undergraduates » 2017
4. Hussain A. Sattar « Fundamentals of pathology medical course and step one review » 2018 Chicago

Additional literature.

1. Harsh Mohan «Pathology: Quick review and MCQs» 2019
2. Robbins and Cotran «Pathologic basis of disease» 2015
3. Harsh Mohan «Textbook of pathology» 2015
4. Harsh Mohan «Pathology: Quick review and MCQs» 2015
5. Robbins «Pathologic basis of disease» 2014
6. Kumar V., Abbas A., Aster J. Robbins «Basic pathology» 2013

Independent work of students.
Independent work of students with literature, writing essays, public speaking form the ability of students to system analysis of medical information, to the ability to apply the data of natural sciences, biomedical and clinical sciences in various types of professional activity, to the perception of innovation, the ability and readiness for self-improvement, self-realization.
The main principle of independent work of students should be on the one hand - the fulfillment of tasks proposed by the department, on the other - the manifestation of initiative of the students themselves (drawing up presentations, situational tasks, schemes, drawings, etc.)
We select auditor and extracurricular independent work.
Independent independent work.
1. Training methods and methods of experimental research in animals.
2. Solution of test and situational tasks.
3. Training in independent compilation of situational tasks, tests.
Extra-independent work.
1. Performing the homework assignments proposed for each lesson:
a) work with a summary, work with a summary of lectures, solve situational problems;
b) work with literature on the topic for each lesson.

2. Work with additional literature (monographs, manuals on pathophysiology) when preparing abstract reports in class and reports for the annual student conference of the medical faculty.
3. Writing and publishing abstracts submitted to the student conference.
4. Participation in the implementation of research work (SRWS) and educational and research work (UIRS) under the guidance of instructors-mentors.
5. Preparation for participation in the Olympiad in pathological physiology and clinical pathophysiology.

Instructions to the abstract.
Title page of the abstract

KYRGYZ-RUSSIAN SLAVIC UNIVERSITY
Faculty of Medicine
Department of Pathological Physiology

_____
(the subject in the spelling without quotes is indicated)

SWS on the subject "Pathological physiology, clinical pathophysiology"

SWS prepared
(Full name of author, group, speciality)

Guide writing SWS carried out

_____
(Full name of scientific supervisor or teacher of pathophysiology, indicating the degree and title)

Bishkek
201__
(indicates the year of the SWS submission)

Instructions for the preparation of the SWS
The limit of the duration of control: protection: 10 minutes speech and answers to questions.
Contents of the actual text of the abstract and the defense:
• information sufficiency;
• compliance of the material with the topic and the plan;
• the presence of a logical structure for constructing the text (introduction with the formulation of the problem, the main part divided by the basic ideas, the conclusion with the conclusions obtained as a result of reasoning);
• Style and language of presentation (expedient use of terminology, explanation of new concepts, brevity, logic, correctness of application and citation design, use of professional terms, quotations, stylistic construction of phrases, etc.);
• the adequacy and number of sources used;
• the presence of a strong own position;
• adequacy of arguments in the substantiation of a personal position;
• aesthetic design of the work (accuracy, text formatting, highlighting, etc.)

Guidelines for preparing a presentation.

Recommendations on the content of presentations and poster presentations.

Presentation.
1. Introduction to the problem.
2. Relevance.
3. Tasks.
4. Materials.
5. Methods.
6. Description of the progress of the study.
7. Results and conclusions.
8. Practical significance.
9. Recommendations.
If you do not consider it necessary to reflect all of the above, we recommend preparing a description of each of them. This will help in answering questions.

Requirements for presentation design.
The purpose of the presentation is to increase the visibility and availability of the report.
1. It is allowed to prepare a presentation in the MPP program in the format p.p.t.

2. Videos must be saved in AVI format.
3. The following information should be present on the first slide:
• University, faculty;
• Department;
• job title;
• speakers;
• scientific director;
• a country;
• city;
• year.
Use background and text colors very different in contrast (white background-black text, blue background-yellow text). Try to use a font not less than 30 pt. Do not load with animation. Use it to

highlight the most important points. For 1 element of the slides, no more than one animation effect. Use diagrams, graphics, photos and drawings, tables, etc.

Poster report.
Dimensions 125x80 mm (but maybe on smaller sheets).
The structure should reflect: the purpose and objectives, materials and methods, results and conclusions.
The title is as follows:

First line in CAPITAL LETTERS
Second line author
Third line Faculty
Fourth line
Fifth line Supervisor

All abbreviations (excluding units of measure) can be used only after mentioning the full terms.
The poster report should contain illustrative material. The font size is not less than 20 pt.
An example of solving a situational problem:
Subject: "Inflammation, mechanisms of exudation. Types of exudate. Pathogenetic features of acute and chronic inflammation »
Task number 1.
Patient N., 25 years old, entered the clinic with a bout of abdominal pain, which arose suddenly and was accompanied by a single vomiting. At inspection: the pain is localized in the right ileal region, has a permanent character. When palpation in the right iliac region, local tension of the muscles of the abdominal wall, with pressure on the abdominal wall and separation of the hand from it, there is a sharp soreness (a positive symptom of Shchetkin-Blumberg). Body temperature is 37.5 ° C. The patient is diagnosed with acute appendicitis.
Questions:
1. To which type of pathological process does this disease belong?
2. Name the types of exudates and characterize them.
3. Outline the principles of therapy for this typical pathological process.
Answers:
1. Inflammation.
2. There are the following types of exudates: serous - protein is small (3-5%), a small number of white blood cells. It is characteristic for inflammation of serous membranes (serous peritonitis, pleurisy). With an admixture of mucus, serous exudate is called catarrhal (catarrhal rhinitis, gastritis) fibrinous with a high content of fibrinogen (with high permeability of blood vessels). If the film of fibrin on mucous membranes is loose, easily separated, the inflammation is called croupous. If tightly soldered, it does not separate - this is a diphtheritic inflammation; Purulent - contains many leukocytes, usually killed and destroyed, enzymes, autolysis products of tissues (greenish muddy); putrefactive - the presence of products of putrefactive decomposition of tissues (bad odor); hemorrhagic - a large content of red blood cells (pink). Hemorrhagic character can take any kind of inflammation (serous, fibrinous, purulent), mixed.
3. Principles of therapy of inflammation are based on etiotropic, pathogenetic and symptomatic principles. Etiotropic therapy: cessation, reduction of strength and / or duration of action on tissues and organs of phlogogenic factors. Destruction of infectious agents that cause inflammation: antibiotics, sulfonamides. Pathogenetic therapy: disruption of the pathogenesis of inflammation, underlying mainly the processes of alteration and exudation: antihistamines, immune provokers, physiotherapeutic procedures. Symptomatic therapy: painkillers.
Example of the student's experimental independent work:
Study task number 1. To study the effect of high temperature on the living organism of the animal.
Content and sequence of the CDS implementation.
1. Mark the behavior of a healthy mouse, skin color (paws and nose area), the number of breaths.
2. The mouse is placed in a jar, which is lowered into a chamber with a high temperature (thermostat).
3. Observe the dynamics of changes in behavior, breathing, etc. experimental animal.
An indication for the implementation of the SSW.

1. Determine the time during which the mouse does not have a visible reaction to high temperature - the period of "indifference".
2. Determine the time during which there is and is growing anxiety, changes in breathing, skin color and mucous membranes - the period of "excitement".
3. Determine the time during which the comatose state continues - the period of "oppression".
Complete the results for the completed task for the SWS:
Make an experiment record, noting the observed changes for the periods, indicating the time of each period.
Make a conclusion about the mechanisms of the observed changes in different periods of overheating.

Attachement 1.

TECHNOLOGICAL MAP OF DISCIPLINE «PATHOPHYSIOLOGY, CLINICAL PATHOPHYSIOLOGY»

IV SEMESTER

Name of moduls of discipline according to course outline	Control	Forms of control	Credit minimum	Credit maximum	Graphic of control (weeks of semester)
Modul 1					
«General pathophysiology. General etiology, pathogenesis, damaging effects of external factors, cell injury»	Formative assessment	Attendance,activity, conspect (lectures and practical class), IWS report situational case, test	**3**	**6**	**3**
	Midterm examination	Written control work, oral interview, tests.	**3**	**6**	
Modul 2					
«Pathophysiology of reactivity and hypersensitivity. Allergy».	Formative assessment	Attendance,activity, conspect (lectures and practical class), IWS report situational case, test	**3**	**6**	**6**
	Midterm examination	Written control work, oral interview, tests.	**4**	**6**	
Modul 3					
« Pathophysiology of local circulation, thrombosis, embolism, inflammation, fever, infection process».	Formative assessment	Attendance,activity, conspect (lectures and practical class), IWS report situational case, test	**6**	**12**	**10**
	Midterm examination	Written control work, oral interview, tests.	**7**	**12**	
Modul 4					
«Pathophysiology of Carbohydrate, Protein, Lipid metabolism».	Formative assessment	Attendance,activity, conspect (lectures and practical class), IWS report situational case, test	**4**	**6**	**13**
	Midterm examination	Written control work, oral interview, tests.	**4**	**6**	
Modul 5					
«Pathophysiology of Acid-base imbalance Tumor, Hypoxia»	Formative assessment	Attendance,activity, conspect (lectures and practical class), IWS report situational case, test	**3**	**5**	**16**
	Midterm examination	Written control work, oral interview, tests.	**3**	**5**	
Total			**40**	**70**	
Midterm examination (credit without mark) (report/presentation)			**20**	**30**	
Semester rating			**60**	**100**	

V SEMESTER

Name of moduls of discipline according to course outline	Control	Forms of control	Credit minimum	Credit maximum	Graphic of control (weeks of semester)
Modul 1					
«Modul 1 "Typical forms of pathology of system of external respiration and cardio-vascular system»	Formative assessment	Attendance,activity, conspect (lectures and practical class), IWS situational case, test, report	**5**	**7**	**5**
	Midterm examination	Written control work, oral interview, tests.	**5**	**9**	
Modul 2					
Modul 2 «Typical forms of blood pathology»	Formative assessment	Attendance,activity, conspect (lectures and practical class), IWS situational case, test, report	**5**	**7**	**10**
	Midterm examination	Written control work, oral interview, tests.	**5**	**9**	
Modul 3					
Modul 3 «Typical forms of liver pathology and gastro-intestinal tract pathology. Typical forms of kidneys pathology»	Formative assessment	Attendance,activity, conspect (lectures and practical class), IWS situational case, test, report	**6**	**10**	**13**
	Midterm examination	Written control work, oral interview, tests.	**6**	**14**	
Modul 4					
Modul 4 «Typical forms of endocrine and nervous system pathology»	Formative assessment	Attendance,activity, conspect (lectures and practical class), IWS situational case, test, report	**4**	**7**	**16**
	Midterm examination	Written control work, oral interview, tests.	**4**	**7**	
		Total	**40**	**70**	
		Midterm examination (exam) written answering by tickets.	**20**	**30**	
		Semester rating	**60**	**100**	

Note:

1. 0.5 points will be decreased for every missed and not reworked practical class or lecture