MINISTRY OF SCIENCE AND HIGHER EDUCATION OF RUSSIAN FEDERATION
Federal State Autonomous Educational Institution of Higher Education
Far Eastern Federal University
SCHOOL OF BIOMEDICINE

AGREED
Head of OP
_____
(Signed) (Full name)

CLAIM
Director of the Department of Medical Biology and Biotechnology
_____
(Signed) (I. A. Surname)
"28" January 2021

WORK PROGRAM OF THE DISCIPLINE
Pathological histology
Direction of training 06.04.01 Biology
(Molecular and Cell Biology)
Form of training: full-time

Course 1 semester 2
lectures 18 h.
practical exercises - hour.
lab work 6 hours
total hours of classroom load 36 hours.
independent work 36 hours.
including 27 hours to prepare for the exam.
exam 2 semester

The work program is drawn up in accordance with the requirements of the Federal State Educational Standard in the direction of training 06.04.01 Biology, approved by the order of the Ministry ofScienceof the Republic of Russia dated 11.08.2020. № 934.

The work program was discussed at the meeting of the Department of Medical Biology and Biotechnology Protocol dated December 30, 2021 No. 5

Director of the Department of Implementing Structural Unit Ph.D., Associate Professor Kumeiko V.V.

Compiled by: assistant Farniev V.M

Vladivostok
2021

Reverse side of the RPD cover page

1. The work program was revised at the meeting of the Department / department / department (implementing the discipline) and approved at the meeting of the Department / department / department (issuing structural unit), the protocol from "_____ __ № _____

2.The work program was revised at the meeting of the Department / department / department (implementing the discipline) and approved at the meeting of the Department / department / department (issuing structural unit), the protocol from "__ № _____

3.The work program was revised at the meeting of the Department / Department / Department (implementing the discipline) and approved at the meeting of the Department / Department / Department (issuing structural unit), the protocol from "____ № _____

4.The work program was revised at the meeting of the Department / Department / Department (implementing the discipline) and approved at the meeting of the Department / Department / Department (issuing structural unit), the protocol from "_____ __ № _____

5.The work program was revised at the meeting of the Department / Department / Department (implementing the discipline) and approved at the meeting of the Department / Department / Department (issuing structural unit), the protocol from "_____ __ № _____

1. Goals and objectives of mastering the discipline:

Purpose: formation of students' understanding of histological changes that occur in the process of occurrence and development of various pathologies in the human body

Tasks:

1. Formation of students' fundamental knowledge about the changes occurring at the tissue level in the human body during the development of pathologies.
2. Formation of students' skills in working with microscopic equipment to assess the severity of pathological changes on finished drugs.
3. Formation of students' knowledge and skills in the manufacture of histological preparations, including from pathologically altered tissues and organs.
4. Acquaintance of students with modern methods of cytological and histological diagnostics.

Professional competencies of graduates and indicators of their achievement:

Task type	Code and name of professional competence (the result of mastery)	Code and name of the competency achievement indicator
research	PC-6 Is capable of developing experimental models, methods of cytological diagnostics, morphometry, marker histo- and cytochemistry, etc.	PC-6.1Projects and carries out fundamental research in the field of studying the patterns of structure and functioning of cells and tissues in normal, experimental and pathological conditions
		PC-6.2Develops and critically evaluates experimental research model in cytology and histology
		PC-6.3Existents histo- and cytological diagnostics, morphometry, marker histo- and cytochemistry

Code and name of the competency achievement indicator	Name of the assessment indicator (the result of training in the discipline)
PC-6.1Projects and carries out fundamental research in the field of studying the patterns of structure and functioning of cells and tissues in normal, experimental and pathological conditions	Knows the methods and methods of assessing the structure and functioning of cells and tissues in normal, experimental and pathological conditions Able to evaluate the results of fundamental research in the field of studying the patterns of structure and functioning of cells and tissues in normal, experimental and pathological conditions Owns the methods and methods of assessing the structure and functioning of cells and tissues in normal, experimental and pathological conditions
PC-6.2Develops and critically evaluates experimental research model in cytology and histology	Knows how to design and evaluate experimental modeland research in the field of cytology and histology Able to evaluate the results of evaluation of the experimental model of research in the field of cytology and histology

	Has the skills to develop and evaluate an experimental research model in the field of cytology and histology
PC-6.3Existents histo- and cytological diagnostics, morphometry, marker histo- and cytochemistry	He knows the methods and algorithms of histo- and cytological diagnostics, morphometrics, marker histo- and cytochemistry Able to evaluate the results of histo- and cytological diagnostics, morphometry, marker histo- and cytochemistry He has the skills of histo- and cytological diagnostics, morphometrics, marker histo- and cytochemistry

1. Labor intensity of discipline and types of training sessions in the discipline

The total labor intensity of the discipline is 2 credited units (72 academic hoursa), (1 credit unit corresponds to 36 academic hours).

Types of training sessions and work of the student in the discipline are:

Designation	Types of training sessions and work of the student
Lek	Lecture
Lek electr.	
Lab	Labs
Lab Electr.	
WED:	Independent work of the student during the period of theoretical training
including control	Independent work of the student and contact work of the student with the teacher during the period of intermediate certification

Structure of the discipline:

The form of training is full-time.

№	Name of the section Discipline	Se me ster	Number of hours by types of training sessions and work of the student						Intermediate attestation forms
			Lek	Lab	Av e	OK	WE D	Cont rol	
1.	Section No1		6	12			3	9	
2.	Section No2		6	12			6	18	
	Total:	2	18	18	-	-	9	27	Exam

THE STRUCTURE AND CONTENT OF THE THEORETICAL PART OF THE COURSE

Lectures 18 hours.

Section No1. Basics of pathological histology (6 hours).

Lecture class No1. Pathohistophysiology in typical pathological processes (3 hours).

Lecture class No2. Typical pathohistological patterns of diseases (3 hours).

Section No2. Private pathohistology (12 hours).

Lecture class No1. Pathohistophysiology of the digestive system (2 hours).

Lecture class No2. Pathohistophysiology of the respiratory system (2 hours).

Lecture class No3. Pathohistophysiology of the cardiovascular system (2 hours).

Lecture class No4. Pathohistophysiology of blood (2 hours).

Lecture class No5. Pathohistophysiology of tumor growth (2 hours).

Lecture class No6. Pathohistophysiology of infectious diseases (2 hours).

IV. STRUCTURE AND CONTENT OF THE PRACTICAL PART OF THE COURSE AND INDEPENDENT WORK

Laboratory work 18 hours.

Section No1. Basics of pathological histology (6 hours).

Laboratory work No1. Pathohistophysiology in typical pathological processes, study and preparation of micropreparations, formulation of biochemical reactions, immunohistochemical studies of pathologically altered tissues. (3 hours).

Laboratory work No2. Typical pathohistological patterns of diseases study and preparation of micropreparations, staging biochemical reactions, immunohistochemical studies of pathologically altered tissues (3 hours).

Section No2. Private pathohistology (12 hours).

Laboratory work No1. Pathohistophysiology of the digestive system study and preparation of micropreparations, staging biochemical reactions, immunohistochemical studies of pathologically altered tissues (2 hours).

Laboratory work No2. Pathohistophysiology of the respiratory system study and preparation of micropreparations, staging biochemical reactions, immunohistochemical studies of pathologically altered tissues (2 hours).

Laboratory work No3. Pathohistophysiology of the cardiovascular system study and preparation of micropreparations, staging biochemical reactions, immunohistochemical studies of pathologically altered tissues (2 hours).

Laboratory work No4. Pathohistophysiology of blood study and preparation of micropreparations, staging biochemical reactions, immunohistochemical studies of pathologically altered tissues (2 hours).

Laboratory work No. 5. Pathohistophysiology of tumor growth study and preparation of micropreparations, staging biochemical reactions, immunohistochemical studies of pathologically altered tissues (2 hours).

Laboratory work No6. Pathohistophysiology of infectious diseases study and preparation of micropreparations, staging biochemical reactions, immunohistochemical studies of pathologically altered tissues (2 hours).

Independent work 36 hours.

Independent work consists of such types of work as the study of material on textbooks, reference books, video materials and presentations, as well as other reliablesources of information; preparation foreven.

V. EDUCATIONAL AND METHODOLOGICAL SUPPORT OF INDEPENDENT WORK OF STUDENTS

Recommendations for independent work of students

The purpose of the independent work of the student is to work meaningfully and independently first with educational material, then with scientific information, to lay the foundations of self-organization and self-education in order to instill the ability to further continuously improve their professional qualifications.

The process of organizing the independent work of the student includes the following stages:

- preparatory (setting goals, drawing up a program, preparing methodological support, preparing equipment);
- basic (implementation of the program, the use of methods of information retrieval, assimilation, processing, application, transfer of knowledge, fixation of results, self-organization of the work process);
- final (assessment of the significance and analysis of the results, their systematization, assessment of the effectiveness of the program and methods of work, conclusions on the directions of labor optimization).

In the process of independent work, the student acquires the skills of self-organization, self-control, self-government, self-reflection and becomes an active independent subject of educational activity. Independent work of students should have an important impact on the formation of the personality of the future specialist, it is planned by the student independently. Each student independently determines the mode of his work and the measure of work spent on mastering the educational content in each discipline. He performs extracurricular work according to a personal individual plan, depending on his preparation, time and other conditions.

Methodical recommendations for independent work of students

As the material on the subject of the discipline is mastered, it is planned to perform independent work of students on the collection and processing of literary material to expand the field of knowledge in the discipline under study, which allows you to deepen and consolidate specific practical knowledge gained in classroom classes. To study and fully master the program material on the discipline, educational, reference and other literature recommended by this program, as well as specialized periodicals, are used.

When independently preparing for classes, students take notes on the material, independently study the issues on the topics covered, using the educational literature from the proposed list, periodicals, scientific and methodological information, databases of information networks.

Independent work consists of such types of work as the study of material on textbooks, reference books, video materials and presentations, as well as other reliablesources of information; preparation foreven. To consolidate the material, it is enough, flipping through the synopsis or reading it, mentally restore the material. If necessary, refer to the recommended educational and reference literature, write down incomprehensible moments in the questions to understand them in the upcoming lesson.

Preparation for practical exercises. This type of independent work consists of several stages:

1) Repetition of the studied material. For this purpose, lecture notes, recommended basic and additional literature are used;

2) Deepening knowledge on the proposed topics. It is necessary to differentiate the available material in lectures, textbooks in accordance with the points of the plan of the practical lesson. Separately write out unclear questions, terms. It is better to do this in the margins of the lecture notes or textbook. Clarification should be carried out with the help of reference literature (dictionaries, encyclopedic publications, etc.);

3) Drawing up a detailed plan for the speech, or conducting calculations, solving problems, exercises, etc. In preparation for practical exercises, students take notes on the material, prepare answers to the above questions on the topics of practical exercises. In addition to the practical material, students independently study questions on the proposed topics, using educational literature from the proposed list, periodicals, scientific and methodological information, databases of information networks (Internet, etc.).

Requirements for the presentation and design of the results of independent work

There are no special requirements for the provision and design of the results of this independent work.

Control over the implementation of the plan of independent work of students is carried out by the teacher in practical classes by interviewing and by including in the final tasks specified in the lesson from the plan of independent work.

VI. MONITORING THE ACHIEVEMENT OF COURSE OBJECTIVES

No p/n	Supervised sections / topics of the discipline	Achievement indicator code and name	Learning outcomes	Assessment tools	
				current control	Intermediate-accurate certification
1.	Section No1 Basics of pathological histology	PC-6.1; PC-6.2; PC-6.3	Knows the methods and methods of assessing the structure and functioning of cells and tissues in normal, experimental and pathological conditions Able to evaluate the results of fundamental research in the field of studying the patterns of structure and functioning of cells and tissues in normal, experimental and pathological conditions Owns the methods and methods of assessing the structure and functioning of cells and tissues in normal, experimental and pathological conditions	Oral interview, testing	Exam
2.	Section No.2 Private pathohistology	PC-6.1; PC-6.2; PC-6.3	Knows the methods and methods of assessing the structure and functioning of cells and tissues in normal, experimental and pathological conditions Able to evaluate the results of fundamental research in the field of studying the patterns of structure and functioning of cells and tissues in normal, experimental and pathological conditions Owns the methods and methods of assessing the structure and functioning of cells and tissues in normal, experimental and pathological conditions	Oral interview, testing	Exam

VII. LIST OF REFERENCES AND INFORMATION AND METHODOLOGICAL SUPPORT OF THE DISCIPLINE

Main literature

1. Paukov, V. S. Pathological anatomy and pathological physiology : ucheb. in the discipline "Pathological Anatomy and Pathological Physiology" for students of medium institutions. prof. obrazovanie / Paukov V. S., Litvitsky P. F. - Moscow : GEOTAR-Media, 2014. - 256 p. - ISBN 978-5-9704-2813-9. - Text : electronic // EBS "Student Consultant" : [site]. - URL : https://www.studentlibrary.ru/book/ISBN9785970428139.html (date of access: 2023.02.17). - Access mode: by subscription.

2. Kogan, E. A. Pathological anatomy : a guide to practical classes (general pathology) : interactive electronic educational publication / Kogan E. A. , Bekhtereva I. A. , Ponomarev A. B. - Moscow : GEOTAR-Media. - Text : electronic // EBS "Student Consultant" : [site]. - URL : https://www.studentlibrary.ru/book/06-COS-2404.html (date of access: 2023.02.17). - Access mode: by subscription.

3. Pathological anatomy : in 2 vols. T. 1. Obshchaya pathologiya : uchebnik / pod red. V. S. Paukova. - 3rd ed. , rev. - Moscow : GEOTAR-Media, 2022. - 752 p. - ISBN 978-5-9704-7095-4. - Text : electronic // EBS "Student Consultant" : [site]. - URL : https://www.studentlibrary.ru/book/ISBN9785970470954.html (date of access: 2023-02-17). - Access mode: by subscription.

4. Pathological anatomy : in 2 vol. T. 2. Chastnaya pathologiya : uchebnik / pod red. V. S. Paukova. - 3rd ed. , rev. - Moscow : GEOTAR-Media, 2022. - 544 p. - ISBN 978-5-9704-7096-1. - Text : electronic // EBS "Student Consultant" : [site]. - URL : https://www.studentlibrary.ru/book/ISBN9785970470961.html (date of access: 17.02.2023). - Access mode: by subscription.

5. Bykov, V. L. Histology, cytology and embryology. Atlas : uchebnoe posobie / Bykov V. L., Yushkantseva S. I. - Moscow : GEOTAR-Media, 2013. - 296 p. - ISBN 978-5-9704-2437-7. - Text : electronic // EBS "Student Consultant" : [site]. - URL : https://www.studentlibrary.ru/book/ISBN9785970424377.html (date of access: 2023-02-17). - Access mode: by subscription.

Further reading

1. Strukov, A. I. Pathological anatomy : textbook : textbook / A. I. Strukov, V. V. Serov; ed. by V. S. Paukov. - 6th ed. , pererab. i dop. - Moscow : GEOTAR-Media, 2015. - 880 p. - ISBN 978-5-9704-3260-0. - Text : electronic // EBS "Student Consultant" : [site]. - URL :

https://www.studentlibrary.ru/book/ISBN9785970432600.html (date of access: 2023.02.17). - Access mode: by subscription.

2. Paukov, V. S. Pathological anatomy. In 2 vols. T. 1. Obshchaya pathologiya : uchebnik / Pod red. V. S. Paukova - Moscow : GEOTAR-Media, 2015. - 720 p. - ISBN 978-5-9704-3252-5. - Text : electronic // EBS "Student Consultant" : [site]. - URL : https://www.studentlibrary.ru/book/ISBN9785970432525.html (date of access: 2023.02.17). - Access mode: by subscription.

3. Anisimova, S. A. Pathological anatomy of inflammation : a textbook for students of the 3rd year in the specialty "General Medicine" / S. A. Anisimova. - Ryazan : OOP UITTiOP, 2019. - 42 p. - Text : electronic // EBS "Student Consultant" : [site]. - URL : https://www.studentlibrary.ru/book/RZNGMU_029.html (date of access: 2023.02.17). - Access mode: by subscription.

List of resources of the information and telecommunication network "Internet"

1. https://nsau.edu.ru/
2. http://www.histology-world.com/

IX. MATERIAL AND TECHNICAL SUPPORT OF DISCIPLINE

Training sessions on the discipline are held in rooms equipped with appropriate equipment and software.

The list of material and technical and software of the discipline is given in the table.

Logistics and Software Discipline

Name of special premises and premises for independent work	Equipment special premises and rooms for independent work	List of licensed software. Details of the supporting document
690922, Primorsky Krai, Vladivostok, Russky Island, Saperny Peninsula, Ajax village, 10, aud. L307	Multimedia audience: Screen with electric drive 236 * 147 cm Trim Screen Line; Projector DLP, 3000 ANSI Lm, WXGA 1280x800, 2000:1 EW330U Mitsubishi; Subsystem of specialized fasteners of equipment CORSA-2007 Tuarex; Video switching	-

	subsystem: DVI DXP 44 DVI Pro Extron matrix switch; DVI twisted pair extender DVI 201 Tx/Rx Extron; Subsystem of audio switching and sound amplification; acoustic system for ceiling mounting SI 3CT LP Extron; digital audio processor DMP 44 LC Extron; extension for IPL T CR48 management controller; Wireless LANs for trainees are provided with a system based on 802.11a/b/g/n 2x2 MIMO(2SS) access points. HP All-in-One 400 All-in-One 19.5 (1600x900), Core i3-4150T, 4GB DDR3-1600 (1x4GB), 1TB HDD 7200 SATA, DVD+/-RW, GigEth, Wi-Fi, WT, usb kbd/mse, Win7Pro (64-bit)+Win8.1Pro(64-bit), 1-1-1 Wty	
690922, Primorsky Krai, Vladivostok, Russky Island, Saperny Peninsula, Ajax village, 10, aud. L433	Multimedia audience: Monoblock HP ProOne 400 G1 AiO 19.5" Intel Core i3-4130T 4GB DDR3-1600 SODIMM (1x4GB)500GB; Projection screen Projecta Elpro Electrol, 300x173 cm; Multimedia projector, Mitsubishi FD630U, 4000 ANSI Lumen, 1920x1080; Mortise interface with TLS TAM 201 Stan automatic cable retraction system; Avervision CP355AF Visualizer; Microphone cordless radio system UHF band Sennheiser EW 122 G3 consisting of a wireless microphone and receiver; LifeSizeExpress 220- Codeconly- Non-AES video conferencing codec; Network video camera Multipix MP-HD718; Two 47" LCD panels, Full HD, LG M4716CCBA; Subsystem of audio switching and sound	-

	amplification; centralized uninterrupted power supply Light microscope Carl Zeiss GmbH Primo Star 3144014501 (13 pcs.); Light microscope with digital camera Altami BIO8 (2 pcs).	
690922, Primorsky Krai, Vladivostok, Russky Island, Saperny Peninsula, Ajax village, 10, aud. M 627	Light microscope Carl Zeiss GmbH Primo Star 3144014501 (13 pcs.); Light microscope with digital camera Altami BIO8 (2 pcs).	-
Computer Class of the School of Biomedicine Aud. L310, 15 workplaces	Screen with electric drive 236 * 147 cm Trim Screen Line; Projector DLP, 3000 ANSI Lm, WXGA 1280x800, 2000:1 EW330U Mitsubishi; Subsystem of specialized fasteners of equipment CORSA-2007 Tuarex; Video switching subsystem: DVI DXP 44 DVI Pro Extron matrix switch; DVI twisted pair extender DVI 201 Tx/Rx Extron; Subsystem of audio switching and sound amplification; acoustic system for ceiling mounting SI 3CT LP Extron; digital audio processor DMP 44 LC Extron; extension for IPL T CR48 management controller; Wireless LANs for trainees are provided with a system based on 802.11a/b/g/n 2x2 MIMO(2SS) access points. HP All-in-One 400 All-in-One 19.5 (1600x900), Core i3-4150T, 4GB DDR3-1600 (1x4GB), 1TB HDD 7200 SATA, DVD+/-RW, GigEth, Wi- Fi, WT, usb kbd/mse, Win7Pro (64-bit)+Win8.1Pro(64-bit), 1-1-1 Wty Light microscope Carl Zeiss GmbH Primo Star 3144014501 (13 pcs.); Light microscope with digital camera Altami BIO8 (2 pcs.).	-

X. VALUATION FUNDS

The following assessment tools are used for discipline:

1. Oral aboutpros
2. Testing

Oral questioning.

Oral questioning allows you to assess the knowledge and logic of the student, the ability to use terminology, speech skills and other communication skills.

The training function is to identify details that for some reason were not sufficiently understood during the training sessions and in preparation for the test.

A survey is a means of control, organized as a special conversation of the teacher with the student on topics related to the discipline being studied, and designed to clarify the amount of knowledge of the student on a certain section, topic, problem, etc.

Examples of topics for oral inquiry

1. Purulent inflammation: causes, types, morphological characteristics, outcome.
2. Putrefactive inflammation: causes, morphological characteristics, outcome.
3. Hemorrhagic inflammation: causes, morphological characteristics, outcome
4. Causes and mechanisms of cell damage. Types of damage.
5. Adaptation: definition, types of adaptive changes.
6. Hypertrophy: causes, types, morphological characteristics. Morphofunctional features of myocardial hypertrophy.

Testing.

Testing is the most effective and objective form of assessing knowledge, skills and abilities, which allows to identify not only the level of educational achievements, but also the structure of knowledge, the degree of its deviation from the norm. Testing involves a standardized, verified procedure for collecting and processing data, as well as their interpretation, allows you to check the knowledge of students on a wide range of issues. Testing excludes the subjectivity of the teacher, both in the process of control and in the process of assessment.

Examples of test tasks

1. Indicate the favorable outcome of "granular" dystrophy:

(a) Transformation into mucoid swelling;

b) reverse development;

c) transformation into hyaline-droplet dystrophy;

d) transformation into hydropic dystrophy;

e) development of necrosis

2. Indicate the main pathogenetic mechanism of development of parenchymal

Dystrophy:

(a) Reducing the supply of oxygen to the cell;

b) enhancement of the functional activity of the cell;

c) reduction of the level of synthetic processes in the cell;

d) enhancement of glycolytic processes in the cell;

e) energy deficit in the cell

3. Define the term "dystrophy":

(a) Metabolic disorder resulting in damage to cellular structures;

b) disruption of the supply of cells and tissues with oxygen;

c) local necrosis of cells and tissues;

d) restoration of lost structures;

e) increased flow of arterial blood to the organ

4. Indicate one of the manifestations of dystrophy:

(a) Mucoid swelling;

b) leukoplakia;

c) glycogenosis;

d) lipoidosis;

e) hyalinosis

6. With the development of parenchymal fatty degeneration in the heart, the following is observed:

a) increased myocardial contractility;

b) cardiac activity does not change;

c) the occurrence of cardiac insufficiency;

d) improvement of heart rhythm regulation;

e) improvement of blood supply to the myocardium

5. With hyaline-droplet dystrophy of the epithelium of the tubules of the kidneys, the following develops:

(a) Proteinuria;

b) oxalaturia;

c) uraturia;

d) lipiduria;

e) phenylketonuria

Test Evaluation Criteria

evaluation	50-60 points (unsatisfactory)	61-75 points (satisfactory)	76-85 points (good)	86-100 points (excellent)

Methodological recommendations that determine the procedures for assessing the results of mastering the discipline

Assessment tools for intermediate attestation

Intermediate certification of students in the discipline is carried out in accordance with local fefu regulations and is mandatory. The form of reporting on the discipline is an exam.

Methodical instructions for passing the exam

The exam is taken by the leading teacher (associate professor, professor), for whom this type of educational load is assigned in an individual plan. The form of the exam is oral.

The time allowed to the student to prepare for the answer to the exam should be no more than 40 minutes. After this time, the student should be ready to respond.

The presence at the examination of unauthorized persons (except for persons carrying out the inspection) without the permission of the relevant persons (rector or vice-rector for academic affairs, director of the School, head of the OBOR or director of the department) is not allowed. Disabled persons and persons with disabilities who do not have the opportunity to move independently are allowed to take the exam with accompanying persons.

With an intermediate assessment, students are given a grade of "excellent", "good", "satisfactory" or "unsatisfactory". If the student does not appear for the exam, an entry "did not appear" is made in the statement.

Exam Questions

1. Hypertrophy: causes, types, morphological characteristics. Morphofunctional features of myocardial hypertrophy.
2. Hyperplasia: causes, types, morphological characteristics, role in carcinogenesis.
3. Atrophy: causes, types, morphological characteristics.
4. Metaplasia: species, morphological characteristics, role in carcinogenesis.

5. Lipidosis (steatosis): causes, morphological characteristics, diagnostic methods, outcomes. Fatty changes in internal organs.

6. Hyalinosis: types, causes, pathogenesis, morphogenesis, morphological characteristics.

7. Melanosis: causes, types, morphological characteristics.

8. Hemosiderosis: types, causes, pathogenesis, morphogenesis, morphological characteristics, diagnostic methods.

9. Jaundice: causes, pathogenesis, classification, morphological characteristics.

10. Calcinosis: types, causes, pathogenesis, morphogenesis, morphological manifestations.

11. Necrosis: causes, mechanism of development, morphological signs. Clinical morfological forms of necrosis.

12. Gangrene: etiology, types, morphological characteristics, outcomes.

13. Heart attack: etiology, types, morphological characteristics, outcomes.

14. Apoptosis: mechanisms of development, morphological characteristics. The importance of apoptosis in physiological and pathological processes.

15. Tumors: etiology, pathogenesis, histogenesis, classification principles.

16. The structure of the tumor and the properties of the tumor cell. The effect of the tumor on the body. Paraneoplastic syndromes.

17. Stages of tumor morphogenesis. Types of tumor growth.

18. Tumor metastasis: types, patterns. Recurrence of the tumor.

19. Benign epithelial tumors. Classification, histogenesis, morphological characteristics, prognosis.

20. Malignant epithelial tumors. Classification, histogenesis, morphological characteristics, prognosis.

21. Benign mesenchymal tumors. Classification, histogenesis, morphological characteristics, prognosis.

22. Malignant mesenchymal tumors. Classification, histogenesis, morphological characteristics, prognosis.

23. Tumors from melanin-forming tissue. Classification, histogenesis, morphological characteristics, prognosis.

24. Lung cancer: etiology, classification, morphological characteristics, complications. Precancerous changes in the bronchi and lung.

25. Esophagitis: etiology, classification, morphological characteristics, outcomes, complications.

26. Esophageal cancer: etiology, classification, morphological characteristics, complications.

27. Acute gastritis: etiology, pathogenesis, morphological characteristics, outcomes, complications.

28. Chronic gastritis: etiology, pathogenesis, classification, morphological characteristics, complications.

29. Peptic ulcer disease: etiology, pathogenesis, morphogenesis, morphological characteristics of chronic ulcers during exacerbation and remission, complications, outcomes.

30. Steatosis of the liver: etiology, pathogenesis, clinical and morphological characteristics, outcomes, complications.

31. Acute viral hepatitis: types, epidemiology, etiology, pathogenesis, clinical morfological forms, complications, outcomes.

32. Chronic viral hepatitis: etiology, classification, clinical morfological characteristics, signs of activity, outcomes, prognosis.

Criteria for grading a student on the exam

Evaluation of the test	Requirements for the formed competencies
"Excellent"	The "excellent" grade is given to the student if he has deeply and firmly mastered the program material, exhaustively, consistently, clearly and logically coherently presents it, is able to closely link the theory with practice, freely copes with tasks, questions and other types of application of knowledge, and does not find it difficult to answer when modifying tasks, uses the material of monographic literature in the answer, correctly justifies the decision made, has versatile skills and techniques implementation of practical tasks on the methodology of scientific research.
"Good"	The "good" grade is given to the student if he firmly knows the material, correctly and substantively presents it, avoiding significant inaccuracies in the answer to the question, correctly applies theoretical provisions when solving practical questions and problems, possesses the necessary skills and techniques for their implementation.
"satisfactory"	The grade "satisfactory" is given to the student if he has knowledge only of the basic material, but has not mastered its details, admits inaccuracies, insufficiently correct wording, violations of the logical sequence in the presentation of the program material, has difficulties in performing practical work.
"unsatisfactory"	The grade "unsatisfactory" is given to a student who does not know a significant part of the program material, makes significant mistakes, uncertainly, with great difficulties performs practical work. As a rule, the grade "unsatisfactory" is given to students who cannot continue their studies without additional classes in the relevant discipline.