


APPROVED
Rector of the Federal State Budgetary
Educational Institution of Higher
Education "North-Ossetian State Medical
Academy" the Ministry of Health of the
Russian Federation (in abbreviated form-
NOSMA MOH Russia)



O.Remizov
«24» May, 2023

**EDUCATIONAL TRAINING PROGRAM OF DISCIPLINE
“PATHOPHYSIOLOGY, CLINICAL PATHOPHYSIOLOGY”**

the main professional educational program of higher education - specialty program in the
specialty 31.05.01 General Medicine, approved, May , 24, 2023

Form of education	Full-time
The period of development	6
Department of	pathological physiology

When developing an educational training program, the discipline is based on:

1. Federal State Educational Standard of Higher Education on specialty 31.05.01 General Medicine, approved by the Ministry of Education and Science of the Russian Federation on February, 09, 2016 №95
2. Academic plan on specialty 31.05.01 General Medicine,
ЛД-16-04-18 ИИ
ЛД-16-05-19 ИИ
ЛД-16-06-20 ИИ,
approved by the Scientific Council of the Federal State Budgetary Educational Institution of Higher Education «North-Ossetia State Medical Academy» of the Ministry of Healthcare of the Russian Federation “24” May 2023, Protocol № 8.

The educational training program of the discipline was approved at a meeting of the central coordinating training and methodological council from “23” May 2023, Protocol №. 5

The educational training program of the discipline was approved by the Scientific Council of the State Medical University of the Federal State Budgetary Educational Institution of Higher Education «North-Ossetia State Medical Academy» of the Ministry of Healthcare of the Russian Federation from “24” May 2023, Protocol № 8.

Head of the department of pathological physiology
Professor

I.G. Dzhioev

Creator:

Head of the department of pathological physiology
Professor



I.G. Dzhioev

Assistant professor

V.A. Gadieva

Reviewers:

Associate Professor, Department of Normal Physiology of
North Ossetian State Medical Academy V.O. Akhpolova

Head of Department of physiology and pathology visceral systems of
Institute of Bio-Medical Research, Russian Academy of Medical Sciences
Professor V.B. Brin

CONTENT OF THE WORK PROGRAM

1. Name of discipline.
2. The list of planned learning outcomes in the discipline, correlated with the planned results of the development of the educational program.
3. Indication of the place of discipline in the structure of the educational program.
4. The volume of discipline in credit units with an indication of the number of academic or astronomical hours allocated to the contact work of students with the teacher (by type of training) and for independent work of students.
5. The content of the discipline, structured by topics (sections) with an indication of the number of academic or astronomical hours and types of training sessions.
6. The list of educational and methodological support for independent work of students in the discipline.
7. Fund evaluation tools for the interim certification of students in the discipline.
8. The list of basic and additional educational literature necessary for the development of the discipline.
9. The list of resources of information and telecommunication network "Internet" (hereinafter - the "Internet"), necessary for the development of the discipline.
10. Methodical instructions for students on the development of the discipline.
11. The list of information technologies used in the implementation of the educational process in the discipline, including a list of software and information reference systems (if necessary).
12. Description of the material and technical base necessary for the implementation of the educational process in the discipline.
13. Introduction of educational activities using e-learning and remote educational technologies.

1. **Name of discipline.** “Pathophysiology, clinical pathophysiology”.

2. **The list of planned results of training in the discipline and the results of the development of the educational program**

№	Number/ index of competence	Content of the discipline (or part thereof)	The learning outcomes of the		
			know	know	own
1	OPIK-1	<p>Introduction. Subject, sections and methods of pathophysiology. Basic concepts of General nosology.</p> <p>Pathogenic effect of external and internal environmental factors.</p> <p>Heredity, variability and pathology.</p> <p>General adaptation syndrome. Stress.</p> <p>The pathophysiology of the inflammation.</p> <p>Acute-phase proteins. Systemic inflammation.</p> <p>Hyper-and hypothermia. Fever.</p> <p>Pathophysiology of hypoxia and hyperoxia.</p> <p>Typical forms of pathology of the blood system. Pathology of hemostasis. Typical forms of pathology of the blood system. Pathology of hemostasis.</p> <p>Typical forms of pathology of the circulatory system.</p> <p>Typical forms of pathology of lung gas exchange function.</p> <p>Typical forms of digestive disorders in the stomach and intestines. Ulcer.</p> <p>Liver failure. Jaundices</p> <p>Typical forms of kidney disease.</p> <p>Typical forms of pathology of the endocrine system.</p> <p>Typical forms of pathology of the nervous system and higher nervous activity.</p> <p>Pathophysiology of pain.</p> <p>Pathophysiology of the cardiovascular system</p> <p>Pathophysiology of extreme conditions . Immunopathophysiology.</p> <p>The pathophysiology of the infectious process. Inflammation.</p> <p>Pathophysiology of hypoxia. Chronic obstructive pulmonary disease.</p>	<p>Principles of medical and technical equipment, computer equipment, computer networks for the purpose of working with information on the main sections of General and private pathophysiology.</p> <p>The most common methods of functional diagnosis used to detect pathology of blood, heart and blood vessels, lungs, kidneys, liver and other organs and systems.</p>	<p>To interpret the results of the most common methods of functional diagnostics used to detect blood, heart and blood vessels, lungs, kidneys, liver and other organs and systems;</p> <p>- to determine and evaluate the results of electrocardiography; spirometry; thermometry; hematological parameters, etc.</p>	<p>Skills to work with computers of different generations, to be guided in the Internet, to possess skills of work with the medical and technical equipment which is used at modeling of pathological processes and diseases.</p>
2	OPIK-7	<p>Introduction. Subject, sections and methods of pathophysiology. Basic concepts of General nosology</p> <p>Pathogenic effect of external and internal environmental factors.</p> <p>Heredity, variability and pathology</p> <p>General adaptation syndrome. Stress.</p> <p>The pathophysiology of the inflamma-</p>	<p>Know the standards of biochemical parameters in the normal and in the main pathological</p>	<p>Use the results of spectrophotometric studies and enzyme immunoassays of biochemical parameters</p>	<p>To master the technology of basic biochemical methods using sets of standard reagents and</p>

		<p>tion. Acute-phase proteins. Systemic inflammation. Hyper-and hypothermia. Fever. Pathophysiology of hypoxia and hyperoxia. Typical forms of pathology of the blood system. Pathology of hemostasis Typical forms of pathology of the blood system. Pathology of hemostasis. Typical forms of pathology of the circulatory system. Typical forms of pathology of lung gas exchange function. Typical forms of digestive disorders in the stomach and intestines. Ulcer. Liver failure. Jaundices Typical forms of kidney disease. Typical forms of pathology of the endocrine system. Typical forms of pathology of the nervous system and higher nervous activity. Pathophysiology of pain. Pathophysiology of the cardiovascular system Pathophysiology of extreme conditions Immunopathophysiology. The pathophysiology of the infectious process. Inflammation. Pathophysiology of hypoxia. Chronic obstructive pulmonary disease.</p>	<p>processes and diseases of organs and organ systems</p>		<p>computer equipment</p>
3	ОПК-9	<p>Introduction. Subject, sections and methods of pathophysiology. Basic concepts of General nosology Pathogenic effect of external and internal environmental factors. Heredity, variability and pathology General adaptation syndrome. Stress. The pathophysiology of the inflammation. Acute-phase proteins. Systemic inflammation. Hyper-and hypothermia. Fever. Pathophysiology of hypoxia and hyperoxia. Typical forms of pathology of the blood system. Pathology of hemostasis. Typical forms of pathology of the blood system. Pathology of hemostasis. Typical forms of pathology of the circulatory system. Typical forms of pathology of lung gas exchange function. Typical forms of digestive disorders in the stomach and intestines. Ulcer. Liver failure. Jaundices</p>	<p>Basic concepts of General nosology; the role of causes, conditions, reactivity of the body in the emergence of innovation, development and completion (outcome) of diseases; causes and mechanisms of typical pathological processes, conditions and reactions, their manifestations and significance for the body in the development</p>	<p>To interpret the results of the most common methods of functional diagnostics used to detect blood, heart and blood vessels, lungs, kidneys, liver and other organs and systems;</p>	<p>Methods of evaluation of the functional state of the human body, skills of analysis and interpretation of the results of modern diagnostic techniques skills pathophysiological analysis of clinical syndromes, to justify pathogenetic methods (principles) of diagnosis, treatment, rehabilitation and prevention of dis-</p>

		<p>Typical forms of kidney disease.</p> <p>Typical forms of pathology of the endocrine system.</p> <p>Typical forms of pathology of the nervous system and higher nervous activity.</p> <p>Pathophysiology of pain.</p> <p>Pathophysiology of the cardiovascular system</p> <p>Pathophysiology of extreme conditions.</p> <p>Immunopathophysiology</p> <p>The pathophysiology of the infectious process. Inflammation.</p> <p>Pathophysiology of hypoxia. Chronic obstructive pulmonary disease.</p>	<p>of various diseases;</p> <p>causes, mechanisms and main manifestations of typical disorders of organs and physiological systems of the body;</p> <p>etiology, pathogenesis, manifestations and outcomes of the most frequent forms of pathology of organs and physiological systems, principles of their etiological and pathogenetic therapy.</p>		<p>eases.</p>
4	ПК-6	<p>Introduction. Subject, sections and methods of pathophysiology. Basic concepts of General nosology</p> <p>Pathogenic effect of external and internal environmental factors.</p> <p>Heredity, variability and pathology</p> <p>General adaptation syndrome. Stress.</p> <p>The pathophysiology of the inflammation.</p> <p>Acute-phase proteins. Systemic inflammation.</p> <p>Hyper- and hypothermia. Fever.</p> <p>Pathophysiology of hypoxia and hyperoxia.</p> <p>Typical forms of pathology of the blood system. Pathology of hemostasis</p> <p>Typical forms of pathology of the blood system. Pathology of hemostasis</p> <p>Typical forms of pathology of the circulatory system.</p> <p>Typical forms of pathology of lung gas exchange function.</p> <p>Typical forms of digestive disorders in the stomach and intestines. Ulcer.</p> <p>Liver failure. Jaundices</p> <p>Typical forms of kidney disease.</p> <p>Typical forms of pathology of the endocrine system.</p> <p>Typical forms of pathology of the nervous system and higher nervous activity.</p>	<p>To know the principles of modern technologies and methods of molecular genetic and immunological studies, taking into account age-sexual and physiological characteristics of the body.</p> <p>Know the principles of forensic examination and the possibility of applying the results of the above-mentioned research methods</p>	<p>Interpret the results of molecular genetic and immunological studies, taking into account age-sexual and physiological characteristics of the body. To be able to apply the acquired knowledge in practical work and in scientific research</p>	<p>The technique of setting the main molecular genetic and immunological methods of research, using ready-made, commercial reagent kits and recording equipment.</p>

		<p>Pathophysiology of pain. Pathophysiology of the cardiovascular system. Pathophysiology of extreme conditions Immunopathophysiology The pathophysiology of the infectious process. Inflammation. Pathophysiology of hypoxia. Chronic obstructive pulmonary disease.</p>			
5	ПК-21	<p>Introduction. Subject, sections and methods of pathophysiology. Basic concepts of General nosology Pathogenic effect of external and internal environmental factors. Heredity, variability and pathology General adaptation syndrome. Stress. The pathophysiology of the inflammation. Acute-phase proteins. Systemic inflammation. Hyper- and hypothermia. Fever. Pathophysiology of hypoxia and hyperoxia. Typical forms of pathology of the blood system. Pathology of hemostasis Typical forms of pathology of the blood system. Pathology of hemostasis. Typical forms of pathology of the circulatory system. Typical forms of pathology of lung gas exchange function. Typical forms of digestive disorders in the stomach and intestines. Ulcer. Liver failure. Jaundices Typical forms of kidney disease. Typical forms of pathology of the endocrine system. Typical forms of pathology of the nervous system and higher nervous activity. Pathophysiology of pain. Pathophysiology of the cardiovascular system. Pathophysiology of extreme conditions Immunopathophysiology The pathophysiology of the infectious process. Inflammation. Pathophysiology of hypoxia. Chronic obstructive pulmonary disease.</p>	<p>Scientific and medical information about the basic concepts of General nosology; the role of causes, conditions, reactivity of the body in the occurrence, development and completion (outcome) of diseases; causes and mechanisms of typical pathological processes, conditions and reactions, their manifestations and significance for the body in the development of various diseases.</p>	<p>To evaluate the parameters of the body systems, to analyze the results of modern methods of laboratory diagnostics, to interpret the results of modern methods of functional diagnostics.</p>	<p>Skills of system approach to the analysis of medical information; principles of evidence-based medicine based on the search for solutions using theoretical knowledge and practical skills;</p>

3. Place of discipline in the structure of the educational program

The discipline "Pathophysiology, clinical pathophysiology" refers to the basic part of the unit 1 of the GEF IN the specialty "Medicine". Studied in the fifth, sixth and ninth semesters.

4. The amount of discipline

Type of educational work	Total hours/credits	Semesters			
		№ 5	№ 6	№ 9	
		hours'	hours'	hours'	
Classroom activities (total), including:	194				
Lectures (L)	58	28	16	14	
Practical classes (PC),	136	72	30	34	
Independent work of the student (IWS), including:	94	44	26	24	
<i>Summary</i>	23	11	6	6	
<i>Preparation for classes (PC)</i>	23	11	6	6	
<i>Preparation for ongoing monitoring</i>	24	11	7	6	
<i>The preparation of interim control</i>	24	11	7	6	
Type of intermediate certification	Credit (C)				
	Exam (Y)		36		
TOTAL: Total labor intensity	hours'	324	144	108	72
	credit unit	9,0	4,0	3,0	2,0

5. Sections of the discipline (module), types of educational activities and forms of control

№	Semester	Name of the subject (section) of the discipline	Types of training activities (in hours)					Forms of ongoing monitoring of progress
			L	LW	PC	IWS	just	
1	V	Introduction. Subject, sections and methods of pathophysiology. Basic concepts of General nosology.	2		3	2	7	JIT, C, T, K3
2,3		Pathogenic effect of external and internal environmental factors.	2		6	4	12	JIT, C, T, K3
4		Heredity, variability and pathology	2		3	2	7	JIT, C, T, K3
5,6		The pathophysiology of the inflammation.	4		9	2	15	JIT, C, T, K3
7		Allergy.	2		6	2	10	JIT, C, T, K3
8		Border control.	-		3	4	7	C, 3C, K3
9		Hyper-and hypothermia. Fever.	2		6	2	10	JIT, C, T, K3
10		Pathophysiology of hypoxia and hyperoxia.	2		6	2	10	JIT, C, T, K3
11		Biorhythms.	2		3	2	7	JIT, C, T, K3
12		General adaptation syndrome. Stress.	2		3	4	9	JIT, C, T, K3
13		Border control	-		3	4	7	C, 3C, K3
14-17		Typical forms of pathology of the blood system.	6		12	6	24	JIT, C, T, K3
18, 19		Pathology of hemostasis.	2		6	4	12	JIT, C, T, K3
20		Border control	-		3	4	7	C, 3C, K3

		Total:	28		72	44	144	
21, 22	VI	Typical forms of pathology of the circulatory system.	4		3	3	10	ЛТ, С, Т, К3
23		Typical forms of pathology of lung gas exchange function.	2		3	2	7	ЛТ, С, Т, К3
24		Border control.	-		3	3	6	С, 3С, К3
25		Typical forms of digestive disorders in the stomach and intestines. Ulcer.	2		3	2	7	ЛТ, С, Т, К3
26, 27		Liver failure. Jaundices.	2		3	3	8	ЛТ, С, Т, К3
28, 29		Typical forms of kidney disease.	2		3	2	7	ЛТ, С, Т, К3
30		Border control	-		3	2	5	С, 3С, К3
		Typical forms of pathology of the endocrine system.	4		3	3	10	ЛТ, С, Т, К3
		Typical forms of pathology of the nervous system and higher nervous activity. Pathophysiology of pain.	-		3	3	6	ЛТ, С, Т, К3
		Border control	-		3	3	6	С, 3С, К3
		Exam					36	С, 3С, К3
		Subtotal	16		30	26	108	
		Total for 5 and 6 semesters:	44		102	70	252	
1		IX	Pathophysiology of the infectious process. Inflammation.	2		4	4	10
2	Immunopathophysiology.		2		4	2	8	ЛТ, С, Т, К3
3	Pathophysiology of hemostasis.		2		4	2	8	ЛТ, С, Т, К3
4	Pathophysiology of the cardiovascular system.		2		6	4	12	ЛТ, С, Т, К3
5	Pathophysiology of hypoxia. Chronic obstructive pulmonary disease.		2		4	2	8	ЛТ, С, Т, К3
6	Pathophysiology of extreme conditions.		2		4	4	10	ЛТ, С, Т, К3
7	Chronobiology, chronomedicine, biorhythms.		2		4	2	8	ЛТ, С, Т, К3
8	Boundary control. Offset.		-		4	4	8	С, 3С, К3
Total for 9 semester:			14		34	24	72	
TOTAL for 5, 6 and 9 semesters:			58		136	94	324	

Reduction of used educational technologies, methods and methods of teaching

JT	traditional lecture	C	based on the results of the interview (oral questioning)
ZS**	solving	T	testing
PS**	practice short	K3	a comprehensive assessment of knowledge
** Activity-oriented educational technologies are identified (in the process of which the methods and algorithms of professional tasks are implemented and worked out)			

6. The list of educational and methodological support for independent work of students in the discipline

№	Semester	The name of the educational-methodical development
1	5, 6, 9	Khetagurova, L. G. Pathophysiology. Textbook diagrams and drawings to your favorites lectures. Vladikavkaz: publishing house. Project-Press, 2007. 222 p.
2	5, 6, 9	Khetagurova L.G., Pashayan S.G., Urumova L.T., Tagaeva I.R. General nosology. Typical pathological processes. Private pathophysiology. Guide to practical classes in pathophysiology. Vladikavkaz. 2007. 223 p.
3	5, 6, 9	Khetagurova L.G., Pashayan S.G., Tagaeva I.R. General nosology. Typical pathological processes and private pathophysiology. Guide to practical classes in pathophysiology for the faculty of dentistry. Vladikavkaz. 2007. 100 p.
4	5, 6, 9	Khetagurova L.G., Pashayan S.G., Urumova L.T., Tagaeva I.R., Datieva F.S., Gadieva V.A., Berezov D.T. Guidelines for independent extracurricular work of students to practical classes in pathophysiology for medical, pediatric and medical-preventive faculties "General nosology. Typical pathological processes. Private pathophysiology (part 1 and 2)". Vladikavkaz. 2009. 92 p and 62 p.
5	5, 6, 9	Khetagurova L.G., Pashayan S.G., Urumova L.T., Tagaeva I.R., Datieva F.S., Gadieva V.A. Methodical recommendations of competence implementation for students of medical, pediatric, medical-preventive, dental and pharmaceutical faculties on pathophysiology. Vladikavkaz. 2012. 26 p.

7. Fund evaluation tools for the interim certification of students in the discipline

№	The list of competencies	Semester	Indicator (s) assessment	Criterion (s) of evaluation	Grading scale	Name of FOS
1	ОПК-1 ОПК-7 ОПК-9 ПК-6 ПК-21	5, 6	see the standard for assessing the quality of education, approved. By order of GBOU VPO SOGDIAN Ministry of health of Russia from 10.07.2018, N 264/o	see the standard for assessing the quality of education, approved. By order of GBOU VPO SOGDIAN Ministry of health of Russia from 10.07.2018, N 264/o	see the standard for assessing the quality of education, approved. By order of GBOU VPO SOGDIAN Ministry of health of Russia from 10.07.2018, N 264/o	Examination tickets. Test task. Typical task.
2	ОПК-1 ОПК-7 ОПК-9 ПК-6 ПК-21	9	see the standard for assessing the quality of education, approved. By order of GBOU VPO SOGDIAN Ministry of health of Russia from 10.07.2018, N 264/o	see the standard for assessing the quality of education, approved. By order of GBOU VPO SOGDIAN Ministry of health of Russia from 10.07.2018, N 264/o	see the standard for assessing the quality of education, approved. By order of GBOU VPO SOGDIAN Ministry of health of Russia from 10.07.2018, N 264/o	Examination tickets. Test task. Typical task.

8. The list of basic and additional educational literature necessary for the development of the discipline

№	Name	Author (s)	Year, place of publication	Number copies		Name EBS
				in library	at the department	link
1	2	3	4	5	6	7
Basic literature						
1	Патофизиология: учебник для мед. вузов: В 2т.	Литвицкий П.Ф.	М.: ГЭОТАР-МЕД, 2006.	по 50 экз.	2	
2	Патофизиология. Руководство к занятиям: учебное пособие	Под ред. П.Ф. Литвицкого	М.: ГЭОТАР-Медиа, 2010	1	1	«Консультант ст-та» http://www.studmedlib.ru/ru/book/ISBN9785970416341.html
3	Патофизиология + CD: учебник.	Литвицкий П.Ф.	М.; ГЭОТАР-Медиа, 2010	42	1	«Консультант ст-та» http://www.studmedlib.ru/ru/book/ISBN9785970414798.html
4	Патофизиология. Задачи и тестовые задания: учебное пособие	Под ред. П.Ф. Литвицкого	М.; ГЭОТАР-Медиа, 2011	2	1	«Консультант ст-та» http://www.studmedlib.ru/ru/book/ISBN9785970424834.html
5	Патофизиология = Pathophysiology: лекции, тесты, задачи	Литвицкий П.Ф., Пирожков С.В., Тезиков Е.Б.	М.: ГЭОТАР-Медиа, 2014.			«Консультант ст-та» http://www.studmedlib.ru/ru/book/ISBN9785970429501.html
6	Патофизиология: учебник в 2-х томах	Литвицкий П.Ф.	М.: ГЭОТАР-Медиа, 2015. Т. 2.		1	«Консультант ст-та» http://www.studmedlib.ru/ru/book/ISBN9785970431771.html
7	Патофизиология: учебник в 2-х томах	Литвицкий П.Ф.	М.: ГЭОТАР-Медиа, 2015. Т. 1.		1	«Консультант ст-та» http://www.studmedlib.ru/ru/book/ISBN9785970431788.html
8	Общая патологическая физиология: учебник	Под ред. В.А. Фролова	М.: Высшее образ. и наука, 2009	100	2	
9	Патологическая физиология	Под ред. Н.Н. Зайко, Ю.В. Быце.	М.: МЕДпресс инфор, 2004, 2007, 2008.	4- 8, 7- 191 8- 93	2	
10	Патофизиология в таблицах и схемах. Лекций	Хетагурова Л.Г.	Владикавказ, 2006.	105	10	
11	Руководство к практическим занятиям по патофизиологии. Общая нозология. Типовые патологические процессы. Частная	Хетагурова Л.Г., Пашаян С.Г., Урумова Л.Т., Такоева З.А., Тагаева И.Р.	Владикавказ: Издательско-полиграфическое предприятие им. В.Гассиева, 2007.	231	5	

1	2	3	4	5	6	7
12	Патофизиология. Основные понятия: учебное пособие	Под ред. А.В. Ефремова	М.: ГЭОТАР- Медиа, 2010			«Консультант ст-та» http://www.studmedlib.ru/ru/book/ISBN9785970416365.html
13	Патофизиология: учебник: в 2-х томах. Том 1	Под ред. В.В. Новицкого, Е.Д. Гольдберга, О.И. Уразовой	М.: ГЭОТАР- Медиа, 2013			«Консультант ст-та» http://www.studmedlib.ru/ru/book/ISBN9785970426579.html
Additional literature						
1	Ситуационные задачи для самоподготовки студентов по патофизиологии	Под ред. Г.В. Порядина	М.: ГОУ ВУНМЦ МЗ РФ, 2001	68		
2	Задачи и тестовые задания по патофизиологии: учеб. пособие	Под ред. П.Ф. Литвицкого.	М.: ГЭОТАР- МЕД, 2002.	18	2	

9. The list of resources of information and telecommunication network "Internet", necessary for the development of the discipline

- ✓ Clinical anatomy and pathophysiology of the cardiovascular system http://issuu.com/sergeimarchenkospb/docs/anatomy_pathophysiology/1
- ✓ National Internet Society of internal medicine specialists <http://www.internist.ru>
- ✓ Russian education Federal portal <http://www.edu.ru>

Domestic and foreign magazines

- ✓ Bulletin of experimental biology and medicine http://www.iramn.ru/journal/bbm_cont.htm
- ✓ Pathological physiology and experimental therapy <http://www.choicejournal.ru/show.php?id=1257>
- ✓ Pathogenesis <http://niiopp.ru/jpatogenes>
- ✓ American journal of clinical pathology. <http://ajcp.ascpjournals.org/>
- ✓ American journal of pathology. <http://www.journals.elsevierhealth.com/periodicals/ajpa>
- ✓ The New England Journal of Medicine. <http://www.nejm.org/>
- ✓ Annual Review of Pathology: Mechanisms of Disease. <http://www.annualreviews.org/journal/pathmechdis>
- ✓ European Journal of Cell Biology. http://www.elsevier.com/wps/find/journaldescription.cws_home/701760/description#descriptio

Useful links

- ✓ Books on pathophysiology download <http://medic-books.net/patofiziologoy/>
- ✓ Online library. Pathology <http://www.vetlib.ru/pathologie/>

10. Methodical instructions for students on the development of the discipline

Training consists of classroom classes (194 hours), including a lecture course and practical training, and independent work (94 hours). The main training time is divided into practical work on the assimilation of theoretical knowledge, the acquisition of practical skills and abilities.

When studying the discipline, it is necessary to use the entire resource of the basic and supplementary educational literature, lecture material, visual AIDS and demonstration materials, laboratory equipment and to master the practical skills and abilities acquired during the work with demonstration

visual AIDS and solving situational problems.

Practical classes are held in the form of seminars, classroom work with microscopic equipment, study of micro-and macro - preparations, use of visual AIDS, solving of situational problems, answers to test tasks according to the algorithm of methodical development of the Department staff.

In accordance with the requirements of the GEF IN the educational process are widely used active and interactive forms of training (developing and problem training in the form of modular training, information training, multimedia training). The share of classes conducted in interactive forms is not less than 5.0 % of the auditor's classes.

Independent work of students implies preparation for practical classes, for entrance, current, intermediate and final controls and includes individual classroom and homework with visual materials, educational basic and supplementary literature, Internet resources, solution of situational problems, writing essays, etc.

Work with educational literature is considered as a kind of educational work on the subject of pathological physiology and is performed within hours allocated for its study (in the section of the SRS).

Each student is provided with access to the library collections of the Academy and the departments. For each section of the discipline developed guidelines for students in all sections of the discipline in the electronic database of the Department.

During the study of the discipline, students under the guidance of a teacher conduct a microscopic study of permanent micropreparations of fixed, painted objects, solve situational problems, draw up a workbook and present the results of the work performed for the signature of the teacher.

Writing an essay contribute to the formation of skills with educational literature, systematization of knowledge and contribute to the formation of General cultural and professional skills.

The student's work in the group creates a sense of collectivism and sociability.

Initial level of knowledge of students is determined by testing, the current control of mastering of the subject is determined by an oral examination in the classroom, in solving typical situational tasks and the answers to the test tasks.

At the end of the study of the discipline is carried out an intermediate control of knowledge using an oral survey, test control, testing of practical skills and solving situational problems.

11. The list of information technologies used in the implementation of the educational process in the discipline

12. Description of the material and technical base necessary for the implementation of the educational process in the discipline

№	Name equipments	Number	Technical condition
Special equipment			
1	Microscope, PCs.	student-10; MB S-15 monocular Micromed-3; biological-2	In the working condition
2	Other equipment	hemocoagulase, hemocytometer, calorimeter, magnetic-laser apparatus RIKTA, the device magnetoelectronic tours, devices Myocard-Holter, aggregometer, hemocoagulometer, encephalo-count, pharmacy scales, torsion, analytical, blood pressure monitors, thermometers, tripods, test tubes, prepare-shaft plates, scissors, needle holders, surgical needles, forceps, flasks, cylinders, small surgical table	In the working condition
3	Tables, PCs.	480	50% needs to be replaced
technical means of training, computer equipment			
1	Computer	4	in working order
2	Laptop	1	in working order
3	Multimedia projector	2	in working order
4	Scanner, printer	printer - 4 Scanner-printer -1	in working order
5	Parabolic screen	1	in working order

13. Introduction of educational activities using e-learning and remote educational technologies.

Semester	Occupation L, TP, S,	Educational technologies used (active, interactive)	Number of hours	% in an interactive	List of software
5, 6, 9	Л	Questions and tasks (sets of tasks) for interactive lectures	58	5	Microsoft Office, PowerPoint; Acrobat Reader; Internet Explorer http://medinfo.ru
5, 6, 9	П	Questions and tasks (sets of tasks) for practical training	136	40	Microsoft Office, PowerPoint; Acrobat Reader; Internet Explorer www.studmedlib.ru - "Student Consultant» http://medinfo.ru
5, 6, 9	С	Questions and tasks (sets of tasks) for the round table, role-playing games, brainstorming, etc.	94	30	Microsoft Office, PowerPoint; Acrobat Reader; Internet Explorer www.studmedlib.ru "Student Consultant» http://medinfo.ru

In the context of the introduction of restrictive measures (quarantine) associated with an unfavorable epidemiological situation, the threat of the spread of a new coronavirus infection and other force majeure events that do not allow full-time training, it is possible to study this discipline or part of it using e-learning and distance learning technologies.

The teaching of the discipline in the above situations will be carried out through the development of an electronic course with access to video lectures and interactive course materials: presentations, articles, additional materials, tests and various tasks. When conducting training sessions, monitoring progress, as well as intermediate certification of students, platforms of the electronic information and educational environment of the academy and/or other e-learning systems recommended for use in the academy, such as Moodle, Zoom, Webinar, etc.

Lectures can be presented in the form of audio, video, "live lectures", etc.

Conducting seminars and practical classes is possible on-line in both synchronous and asynchronous modes. Seminars can be held in the form of web conferences.