Federal State Budgetary Educational Institution of Higher Education
"Privolzhsky Research Medical University"
Ministry of Health of the Russian Federation

APPROVED
Vice-Rector for Academic Affairs
E.S. Bogomolova
31 August 2021

WORKING PROGRAM

Name of the academic discipline: **HISTOLOGY, EMBRYOLOGY, CYTOLOGY**

Specialty: **31.05.01 GENERAL MEDICINE**

Qualification: **GENERAL PRACTITIONER**

Department: **HISTOLOGY WITH CYTOLOGY AND EMBRYOLOGY**

Mode of study: **FULL-TIME**

Labor intensity of the academic discipline: **216 academic hours**

Nizhny Novgorod
2021

The working program has been developed in accordance with the Federal State Educational Standard for specialty 31.05.01 GENERAL MEDICINE approved by Order of the Ministry of Science and Higher Education of the Russian Federation No. 988 of August 12, 2020.

Developers of the working program:
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The program was reviewed and approved at the department meeting (protocol No 7, 04/15/2021)
Head of the Department of Histology with Cytology and Embryology of FGBU VPO PIMU Ministry of Health of Russian Federation,
Doctor of Biology, Associate Professor, _____ /M.L. Bugrova/
(signature)

04/15/2021

AGREED
Deputy Head of EMA ph.d. of biology _____ Lovtsova L.V.
(signature)

04/15/2021

1. The purpose and objectives of mastering the academic discipline "Histology, embryology, cytology" (hereinafter – the discipline):

1.1. The purpose of mastering the discipline: (*participation in forming the relevant competencies).*

- Able to carry out a critical analysis of problem situations based on a systematic approach, develop an action strategy (UC-1)
- Able to assess morphofunctional, physiological conditions and pathological processes in the human body to solve professional problems (GPC-5);
- Able to understand the principles of modern information technologies and use them to solve the tasks of professional activity (GPC-10).

1.2. Requirements to the deliverables of mastering the discipline

As a result of completing the discipline, the student should

Know:

- general and specific structural and functional properties of cells of all body tissues and patterns of their embryonic and postembryonic development;
- functional, age-related and protective-adaptive changes in histological elements;
- basic histological international terminology;

Be able to:

- investigate histological preparations using a computer and a light microscope;
- identify organs, tissues, cells and non-cellular structures at the microscopic level$
- evaluate the hemogram and percent of leukocytes;

Possess:

- skills of working with educational and scientific literature;
- skills of independent analytical, research work.

2. Position of the academic discipline in the structure of the General Educational Program of Higher Education (GEP HE) of the organization.

2.1. The discipline **"Histology, embryology, cytology"** refers to the core part of Block 1 of GEP HE (B1.C.16).

The discipline is taught in 2-3 semester/1-2 year of study.

2.2. The following knowledge, skills and abilities formed by previous academic disciplines are required for mastering the discipline:

- ***biology***
- ***physics***
- ***chemistry***

Parallel study of anatomy, physiology with histology, embryology, cytology creates a view of the human body as a whole for the further study of medical and sanitary disciplines.

2.3. Mastering the discipline is required for forming the following knowledge, skills and abilities for subsequent academic disciplines:

- ***pathological anatomy***
- ***pathological physiology***

3. Deliverables of mastering the academic discipline and metrics of competence acquisition

Mastering the discipline aims at acquiring the following universal (UC) or/and general professional (GPC) or/and professional (PC) competencies

№	Competence	The content of the	Code and name of the competence acquisition	As a result of mastering the discipline, the students should:

	code	competence (or its part)	metric	know	be able to	possess
1.	UC-1	Able to carry out a critical analysis of problem situations based on a systematic approach, develop an action strategy	IC $_{UC-1.1}$ Knows: methods of critical analysis and evaluation of modern scientific achievements; basic principles of critical analysis IC $_{UC-1.2}$ Able to: gain new knowledge based on analysis, synthesis, etc.; collect data on complex scientific problems related to the professional field; search for information and solutions based on action, experiment and experience IC $_{UC-1.3}$ Has practical experience: researching the problem of professional activity using analysis, synthesis and other methods of intellectual activity; developing an action strategy to solve professional problems	Methods of critical analysis and evaluation of modern scientific achievements in the field of histological research; basic principles of critical analysis	To gain new knowledge based on analysis, synthesis, etc.; to collect data on complex scientific problems related to the professional field; to search for information and solutions based on actions, experiment and experience	Practical experience: research of the problem of professional activity with the use of analysis, synthesis and other methods of intellectual activity; development of an action strategy for solving professional problems
2.	GPC-5	Able to assess morphofunctional, physiological conditions and pathological processes in the human body to solve professional problems	IC1 $_{GPC-5.1}$ Knows: anatomy, histology, embryology, topographic anatomy, physiology, pathological anatomy and physiology of human organs and systems IC2 $_{GPC\ 5.2}$ Able to: evaluate the basic morphological and functional data, physiological conditions and pathological processes in the human body IC2 $_{GPC\ 5.3}$ Has practical experience	Basic laws of development, structure and vital activity of the human body based on the structural and functional organization of cells, tissues and organs; methods of histological examination; systemic properties in the	To work with a light microscope; to give a histophysiological assessment of the state of various cellular, tissue and organ structures in humans; to use educational and scientific literature,	The technique of light microscopy of histological preparations; the skills of describing histological preparations and electronic microphotographs.

			in: assessment of basic morphological and functional data, physiological conditions and pathological processes in the human body when solving professional problems	relationship of structural elements of the human body; knowledge of basic natural science and, in particular, medical terminology.	the Internet for professional activities.	
3.	GPC-10	Able to understand the principles of modern information technologies and use them to solve the tasks of professional activity	IC1 $_{GPC10.1}$ Knows: the capabilities of reference information systems and professional databases; methods of information retrieval, information and communication technologies; modern medical and biological terminology; fundamentals of information security in professional activities IC2 $_{GPC10.2}$ Able to: apply modern information and communication technologies to solve the tasks of professional activity; carry out an effective search for information necessary to solve the tasks of professional activity using reference systems and professional databases; use modern medical and biological terminology; master and apply modern information and communication technologies in professional IC3 $_{GPC10.3}$ Has practical experience in the use of modern	Possibilities of reference information systems and professional databases; methods of information retrieval, information and communication technologies; basic natural science and, in particular, medical terminology.	To apply modern information and communication technologies in the study of the subject; to carry out an effective search for information necessary for the study of histology using reference systems and professional databases; to use modern medical and biological terminology; to master and apply modern information and communication technologies in educational activities, taking into account the	The skills of using modern information and bibliographic resources, the use of special software and automated information systems to solve educational tasks, taking into account the basic requirements of information security

			information and bibliographic resources, the use of special software and automated information systems to solve standard tasks of professional activity, taking into account the basic requirements of information security		basic requirements of information security	

4. Sections of the academic discipline and competencies that are formed when mastering them

№	Competence code	Section name of the discipline	The content of the section in teaching units
1.	UC-1 GPC-5 GPC-10	Cytology	Methods and techniques of histological studies. Cells. Intercellular substance.
			The structure of the cytoplasm.
			The nucleus. Cell reproduction
2.	UC-1 GPC-5 GPC-10	Human Embryology	Basis of human embryology.
1-2	UC-1 GPC-5 GPC-10	Cytology and embryology	***Current monitoring***
3.	UC-1 GPC-5 GPC-10	General histology	Epithelial tissue
			Connective tissues
			Muscle tissue
			Nervous tissue
			Current monitoring
4.	UC-1 GPC-5 GPC-10	Special histology	Cardiovascular system
			Hematopoietic and lymphatic organs
			Digestive system
			Current monitoring
			Endocrine system
			Urinary system
			Male reproductive system
			Female reproductive system
			Fetal membranes and provisional organs
			Current monitoring

5. Volume of the academic discipline and types of academic work

Type of educational work	Labor intensity		Labor intensity (AH) in semesters			
	volume in credit units (CU)	volume in academic hours (AH)	2	3		
Classroom work, including	**3,4**	**108**	**54**	**54**		
Lectures (L)	1,0	26	14	12		

Laboratory practicum (LP)*						
Practicals (P)	2,4	82	40	42		
Seminars (S)						
Student's individual work (SIW)	**1,6**	**72**	**36**	**36**		
Mid-term assessment						
Exam	**1,0**	**36**		**36**		
TOTAL LABOR INTENSITY	**6,0**	**216**	**90**	**126**		

6. Content of the academic discipline

6.1. Sections of the discipline and types of academic work

№	Name of the section of the academic discipline	Types of academic work* (in AH)					
		L	LP	P	S	SIW	total
1.	Introduction to the subject. Histological technique. Cytology	4		12		6	22
2.	Human embryology	2		3		6	11
3.	General histology	8		24		16	41
4.	Special histology	12		43		44	106
	TOTAL	**26**		**82**		**72**	**180**

* - L – lectures; LP – laboratory practicum; P – practicals; S – seminars; SIW – student's individual work.

6.2. Thematic schedule of educational work types:

6.2.1 Thematic schedule of lectures

№	Name of lecture topics	Volume in AH	
		2 semester	3 semester
1.	**INTRODUCTION TO THE COURSE OF HISTOLOGY. CYTOLOGY.** The subject and tasks of histology, its significance for medicine, research methods. The main manifestations of the vital activity of cells. Synthetic processes in the cell. Intracellular regeneration. Intercellular interactions. The reaction of cells to external influences. The cell nucleus. The life cycle and reproduction of the cell.	4	
2.	**HUMAN EMBRYONIC DEVELOPMENT**. The meaning and periods of embryogenesis: fertilization, crushing, gastrulation, histogenesis and organogenesis. Medical periodization of human embryogenesis.	2	
3.	**TISSUES**: general presentation and classification. Criteria for the classification of tissues. **EPITHELIUM**. Morphofunctional characteristics of epithelium. Classification. Regeneration. Glands. Principles of classification of glands. Types of secretion.	2	
4.	**CONNECTIVE AND SUPPORTING TISSUES**. Classification. **BLOOD AND LYMPH**. Blood cells and cellular elements: structure and meaning. **CONNECTIVE TISSUES PROPER**. Loose fibrous connective tissue. Cells and intercellular substance. Dense connective tissue.	2	

	Special types of connective tissues.		
5.	**SKELETAL TISSUE.** **CARTILAGE**: structure and development. **BONE**: types, structure, development and regeneration. Age-related changes.	2	
6.	**MUSCLE TISSUE**. Classification. Features of the structure, functioning, histogenesis and regeneration of various types of muscle tissue. Receptor elements of the motor analyzer.	2	
7.	**NERVOUS TISSUE**. Types of neurons and neuroglia. Peripheral departments of analyzers. Nerve fibers. Nerve endings. Synapses. Interneuronal connections and principles of the organization of neural systems. Histogenesis and regeneration of nervous tissue.		
8.	**CARDIOVASCULAR SYSTEM**. Blood and lymphatic vessels: classification, features of structure and functioning. Heart. Histogenesis and structure of the heart wall. Types of cardiomyocytes. The conducting system of the heart. Innervation. Regeneration. Age-related changes.		
9.	**ORGANS OF HEMATOPOIESIS AND IMMUNOGENESIS**. Embryonic and postembryonic hematopoiesis. Unitary theory of hematopoiesis. Stem cells. Characteristics of hematopoietic elements at different stages of development, cellular compartments of the bone marrow. Development, structure and vital activity of the bone marrow, thymus, spleen, lymph nodes. Lymphoid tissue of internal organs. Regulation of hematopoiesis, the role of specific stroma of the organs of hematopoiesis and immunogenesis.		2
10.	**ALIMENTARY CANAL**. Embryonic sources. The general plan of the wall structure. Esophagus, wall features throughout. Stomach. Intestine. Structure, cellular composition of the mucosa, histophysiology, blood supply and innervation; structural and functional features in different departments.		2
11.	**GLANDS OF THE DIGESTIVE SYSTEM**: salivary, pancreas, liver with gallbladder. Their embryonic sources and structure. Essential characteristics of the blood supply of the liver.		2
12.	**ENDOCRINE SYSTEM**. General structural and functional characteristics and classification of endocrine organs. The concept of neurotransmitters, target organs and the principles of their interaction. Hypothalamic-pituitary relationship. Pituitary gland. Thyroid gland. Parathyroid glands. The adrenal glands. Sources of their embryonic development, structure, structural and functional characteristics.		2
13.	**URINARY SYSTEM**. Kidney: development, structure of the nephron, blood supply. Histophysiology of urine formation. Juxtaglomerular apparatus, its structure and significance. Endocrine function of the kidney. Excretory passages.		2
14.	**THE REPRODUCTIVE SYSTEM**. Development. **THE MALE REPRODUCTIVE SYSTEM**. Testis: generative and endocrine structures. Genital ducts: ductus epididymis, prostate gland and other components.		2

15.	**THE FEMALE REPRODUCTIVE SYSTEM**. Ovaries, oviducts, uterus, vagina, mammary gland. Menstrual cycle and its regulation. Ovogenesis and other cyclic changes in the genitals.		
16.	**FETAL MEMBRANES AND HUMAN PRIVISIONAL ORGANS**. Placenta, amnion and umbilical cord. Their formation, structure and significance in human embryogenesis.		
	TOTAL (total – **26** AH)	**14**	**12**

6.2.2. The thematic plan of laboratory practicums (*this type of classes is unstipulated in the curriculum)*

6.2.3. Thematic plan of practicals

№	Name of the topics of practicals	Volume in AH	
		2 semester	3 semester
1.	Methods and techniques of histological studies. Cells. Intercellular substance	3	
2.	The structure of the cytoplasm	3	
3.	The nucleus. Cell reproduction	3	
4.	Human embryology	3	
5.	***Current monitoring***	2	
6.	Epithelial tissue. Glands	3	
7.	Mesenchyme. Blood. Lymph. Reticular tissue	3	
8.	Connective tissue proper. Adipose tissue	3	
9.	Cartilage tissue. Cartilage	3	
10.	Bone tissue. Bone formation. Bone	3	
11.	Muscle tissue. Muscle	3	
12.	Nervous tissue	3	
13.	***Current monitoring***	2	
14.	Cardiovascular system	3	
15.	Central hematopoietic and lymphatic organs		3
16.	Peripheral hematopoietic and lymphatic organs		3
17.	Digestive system. Organs of oral cavity		3
18.	Digestive system. Pharynx. Esophagus. Stomach		3
19.	Digestive system. Intestine		3
20.	Digestive system. Digestive glands		3
21.	Digestive system. Liver. Gall bladder		3
22.	***Current monitoring***		3
23.	Endocrine system		3
24.	Urinary system		3
25.	Male reproductive system		3
26.	Female reproductive system		3
27.	Fetal membranes and provisional organs		3

28.	***Current monitoring***		3
	TOTAL (total – **82** AH)	**40**	**42**

6.2.4. Thematic plan of seminars (*this type of classes is unstipulated in the curriculum)*

6.2.5. Types and topics of student's individual work (SIW)

№	Types and topics of SIW	Volume in AH	
		2 semester	3 semester
1.	Working with electronic educational resources on the distance education portal of PIMU	18	18
2.	Working with literature and other sources of information	18	18
	TOTAL (total – **72** AH)	**36**	**36**

7. Types of assessment formats for ongoing monitoring and mid-term assessment

№	Semester No.	Types of control		Name of section of academic discipline	Competence codes	Assessment formats		
						types	number of test questions	number of test task options
1	2	Current monitoring	Control of mastering the topic	Introduction to the subject. Histological technique. Cytology. Human embryology.	UC-1 GPC-5 GPC-10	Test	30	1
			Monitoring the student's individual work			Light microscopy technique.Diagnostics of histopreparations and electron micrographs		2 1
2	2		Control of mastering the topic	General histology	UC-1 GPC-5 GPC-10	Test	30	1
			Monitoring the student's individual work			Diagnostics of histopreparations and electron micrographs		2 1
3	2-3		Control of mastering the topic	Special histology	UC-1 GPC-5 GPC-10	Test	30	1
			Monitoring the student's individua			Diagnostics of histopreparations and electron micrographs		2 1

			l work					
4	3		Control of masterin g the topic	Special histology	UC-1 GPC-5 GPC-10	Test	30	1
			Monitori ng the student's individua l work			Diagnostics of histopreparatio ns and electron micrographs		2 1
5	3	Mid-term assess ment	Exam	Histology, embryology, cytology	UC-1 GPC-5 GPC-10	Test control	50	1
						Diagnostics of histopreparatio ns and electron micrographs		3 1
						Job interview		1

EXAMPLES OF EVALUATION MEANS:

1. The skills of mastering the technique of light microscopy are tested during the first thematic control.
2. Protocols of practical classes, drawn up by students personally on the basis of studying histopreparations, are used for the current control.
3. The assimilation of theoretical knowledge is discussed during the interview on questions to the topic of the lesson.
4. The assimilation of key terms and classification is controlled by sets of test tasks.

Test tasks examples:

	Questions	Select one or more correct answers
1	STRUCTURE CONNECTING EPITHELIUM TO CONNECTIVE TISSUE	basement membrane cytolemma plasma membrane amorphous substance glycocalyx
2	APICAL SURFACE MODIFICATIONS OF EPITHELIOCYTES:	flagellum cilia microvilli folds citopodia
3	TYPICAL NEURONS OF SENSORY GANGLIA	interneurons pseudounipolar unipolar multipolar bipolar
4	SPECIFIC CLASSIFICATION OF THE ORAL EPITHELIUM	lining masticatory specialized intermediate

		mucous
5	GLANDS OF THE ESOPHAGEAL MUCOSA:	cardiac propria fundic pyloric duodenal

5. For the Current monitoring of the assimilation of educational material, thematic control classes are used, combining diagnostics and "reading" histopreparations and electronic microphotographs, as well as test tasks on relevant topics.

6. The course examination control includes examination testing and an interview on the issues of the examination ticket.

There are only 54 exam tickets.

3 histopreparations and an electronic micrograph are attached to each ticket. The ticket contains three questions. The first question is purely practical, requires recognition and description of histopreparations and electronic micrography. The answer to the second question requires a detailed description of one of the histopreparations and involves a combination of theoretical knowledge and the ability to apply them to its analysis. The third question is devoted to one of the major topics of the course.

Examples of exam tickets:

EXAMINATION CARD

FACULTY OF GENERAL MEDICINE
DEPARTMENT OF HISTOLOGY, CYTOLOGY AND EMBRYOLOGY

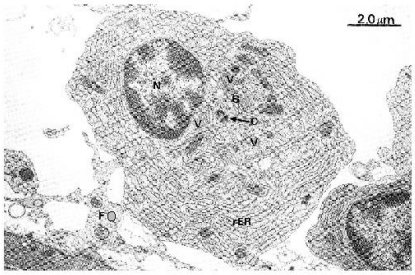
1. Names and characteristics of histological preparations.
2. Oral cavity. The precursors of development. General morpho-functional characteristics of mucosa. The oral mucosa. Lip. Tongue: layers, papillae, organ of taste, minor salivary glands. Gingiva or gum. Cheek. Hard Palate. Soft Palate. Tonsils.
3. Female reproductive system. Ovary. The structural organization and functions. Gametogenesis and steroidogenesis. Uterus. Cyclic changes. Mammary gland.

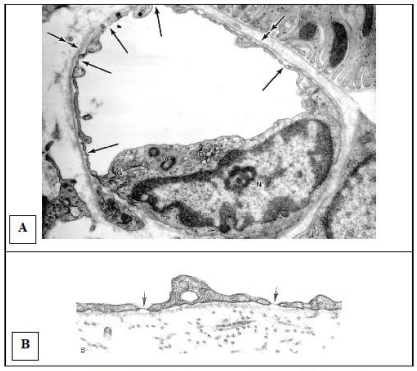
EXAMINATION CARD

FACULTY OF GENERAL MEDICINE
DEPARTMENT of OF HISTOLOGY, CYTOLOGY AND EMBRYOLOGY

1. Names and characteristics of histological preparations.
2. The germ layers and their derivatives at the end of gastrulation.
3. The central nervous system. Brain and spinal cord. Origination in embryogenesis. White and gray matter. Internal and external interneuronal connections the spinal cord. Spinal elements in sensory systems. Ability for regeneration.

Examples of electron micrographs for credit:





8. Educational, methodological and informational support for mastering the academic discipline (printed, electronic publications, the Internet and other network resources)

8.1. Key literature references

№	Name according to bibliographic requirements	Number of copies	
		at the department	in the library
1.	Ross, M.H. Histology: a Text and Atlas / M.H. Ross, G.I. Kaye, W. Pawlina – Philadelphia.: Lippincott W&W, 2016. – 876 pp.	no	50
2.	Gartner, L.P. Color Textbook of Histology / L.P. Gartner, J.L. Hiatt – W.B.Saunders Company, 2017. – 577 pp.	no	50
3.	Yushkantseva, Sophia I.A brief atlas of histology, citology and embryology / S.I. Yushkantseva, V. Bykov. – St.Petersburg : s.n., 2007. – 120 pp..: 279 ill.	no	100

8.2. Further reading

№	Name according to bibliographic requirements	Number of copies	
		at the department	in the library
1.	Textbook of oral and maxillofasial anatomy, histology, and embryology. Oxford University Press, 2006.-286c.	no	Electronic library system
2.	Carlson, B.M. Human Embryology and Developmental Biology: textbook / B.M. Carlson. – Elsevier, Mosby, 2004. – 528 pp.	no	Electronic library system
3.	Sadler, T.W. Langman's Medical Embryology: textbook / T.W. Sadler. – Lippincott W&W, 2000. – 504 pp.	no	Electronic library system
4.	Methodological manuals for practical classes for students in modules	for each student (in the SDE)	

8.3. Electronic educational resources for teaching academic subjects

8.3.1. Internal Electronic Library System of the University (IELSU)

№	Name of the electronic resource	Brief description (content)	Access conditions	Number of users
1	Internal electronic library system (IELS) http://nbk.pimunn.net/MegaPro/Web	Proceedings of the faculty of the university: textbooks, teaching aids, collections of problems, methodological manuals,	From any computer and mobile device with an individual login and	Not limited

		laboratory work, monographs, collections of scientific papers, scientific articles, dissertations, abstracts of dissertations, patents	password. Access mode: http://nbk.pimunn.net/MegaPro/Web	

8.3.2. Electronic educational resources acquired by the University

№	Name of the electronic resource	Brief description (content)	Access conditions	Number of users
1.	ELS "Student Advisor" (Electronic database "Student Advisor". Database “Medicine. Healthcare (VO) and “Medicine. Healthcare (SPO)") http://www.studmedlib.ru	Educational literature, additional materials (audio, video, interactive materials, test tasks) for higher medical and pharmaceutical education	From any computer and mobile device with an individual login and password. Access mode: http://nbk.pimunn.net/MegaPro/Web	Not limited
2.	Database “Doctor's Consultant. Electronic Medical Library» https://www.rosmedlib.ru	National guidelines, clinical guidelines, textbooks, monographs, atlases, pharmaceutical guides, audio and video materials, ICD-10 and ATC	From any computer and mobile device with an individual login and password. Access mode: http://nbk.pimunn.net/MegaPro/Web	Not limited
3.	Electronic library system "Bukap" https://www.books-up.ru	Educational and scientific medical literature of Russian publishing houses, incl. translations of foreign publications. Within the framework of the Big Medical Library project, publications of universities participating in the project are available	From any computer and mobile device using an individual login and password; access from university computers is automatic. Publications from the "My Books" section are available for reading. Access mode: http://nbk.pimunn.net/MegaPro/Web	Not limited
4.	Electronic periodicals as part of the database "Scientific electronic library eLIBRARY https://elibrary.ru	Electronic medical magazines	From university computers. Access mode: https://elibrary.ru	Not limited

5.	Integrated information and library system (IBS) of the scientific and educational medical cluster of the Volga Federal District - "Srednevolzhsky" (contract free of charge)	Electronic copies of scientific and educational publications from the funds of the libraries participating in the scientific and educational medical cluster of the Volga Federal District "Srednevolzhsky"	Access by individual login and password from any computer and mobile device. Access mode: sites of libraries participating in the project	Not limited
6.	National Electronic Library (NEL) (contract free of charge) http://нэб.рф	Electronic copies of publications (including scientific and educational) on a wide range of knowledge	Scientific and educational works that have not been republished for the last 10 years are in the public domain. Works limited by copyright – from the computers of the scientific library. Access mode: http://нэб.рф	Not limited

8.3.3 Open access resources

№	Name of the electronic resource	Brief description (content)	Access conditions
1.	Federal Electronic Medical Library (FEML) http://нэб.рф	Full-text electronic copies of printed publications and original electronic publications in medicine and biology	From any computer on the Internet. Access mode: http://нэб.рф
2.	Scientific electronic library eLIBRARY.RU https://elibrary.ru	Abstracts and full texts of scientific publications, electronic versions of Russian scientific journals	From any computer and mobile device. Access mode: https://elibrary.ru
3.	Scientific electronic library of the open Access CyberLeninka http://cyberleninka.ru	Full texts of scientific articles with annotations published in scientific journals in Russia and neighboring countries	From any computer and mobile device. Access mode: http://cyberleninka.ru
4.	Springer Electronic Collection https://rd.springer.com	Full-text scientific publications (journals, books, articles, scientific protocols, conference proceedings)	From university computers. Access mode: https://rd.springer.com
5.	Wiley Periodicals Database www.onlinelibrary.wiley.com	Wiley Periodicals	From university computers, from any computer using an individual login and password Access mode: www.onlinelibrary.wiley.com
6.	Electronic collection of periodicals "Freedom" on the	Elsevier Periodicals	From university computers, from any computer using an

	Science Direct platform https://www.sciencedirect.com		individual login and password Access mode: https://www.sciencedirect.com
7.	Scopus database www.scopus.com	International Science Citation Abstract Database	From university computers, from any computer using an individual login and password Access mode: www.scopus.com
8.	Web of Science Core Collection Database https://www.webofscience.com	International Science Citation Abstract Database	From university computers, from any computer using an individual login and password Access mode: https://www.webofscience.com
9.	Questel Database Orbit https://www.orbit.com	Questel Patent Database	From university computers Access mode: https://www.orbit.com
10	PubMed https://www.ncbi.nlm.nihgov/pubmed	Search engine of the US National Library of Medicine on the databases "Medline", "PreMedline"	From any computer and mobile device. Access mode: https://www.ncbi.nlm.nihgov/pubmed
11	Directory of Open Access Journals http://www.doaj.org	Directory of open access to the full-text collection of periodicals	From any computer and mobile device. Access mode: http://www.doaj.org
12	Directory of open access books (DOAB) http://www.doabooks.org	Directory of open access to the full-text collection of scientific books	From any computer and mobile device. Access mode: http://www.doabooks.org

9. Material and technical support for mastering an academic discipline

9.1. List of premises for classroom activities for the discipline

1. Large lecture hall - 303 seats
2. Classrooms for practical classes (6 rooms for 84 workplaces)

9.2. List of equipment for classroom activities for the discipline

1. Multimedia complexes (laptop, projector, screen) in the lecture hall
2. Computers for individual work of students in classrooms
3. Sets of scanned histopreparations for the discipline
4. Laptops in classrooms to demonstrate materials on televisions
5. Televisions in classrooms
6. Light microscopes in classrooms to demonstrate histopreparations
7. Sets of histopreparations on all topics
8. Sets of multimedia visual materials
9. Blackboards in classrooms
10. A set of electronic microphotographs for the course
11. Test tasks on the topics of classes

9.3. A set of licensed and freely distributed software, including domestic production

Item no.	Software	number of licenses	Type of software	Manufacturer	Number in the unified register of Russian software	Contract No. and date
1	Wtware	100	Thin Client Operating System	Kovalev Andrey Alexandrovich	1960	2471/05-18 from 28.05.2018
2	MyOffice is Standard. A corporate user license for educational organizations, with no expiration date, with the right to receive updates for 1 year.	220	Office Application	LLC "NEW CLOUD TECHNOLOGIES"	283	without limitation, with the right to receive updates for 1 year.
3	LibreOffice		Office Application	The Document Foundation	Freely distributed software	
4	Windows 10 Education	700	Operating systems	Microsoft	Azure Dev Tools for Teaching Subscription	
5	Yandex. Browser		Browser	«Yandex»	3722	
6	Subscription to MS Office Pro for 170 PCs for FGBOU VO "PIMU" of the Ministry of Health of Russia	170	Office Application	Microsoft		23618/HN10030 LLC "Softline Trade" from 04.12.2020

10. List of changes to the working program (to be filled out by the template)

Federal State Budgetary Educational Institution of Higher Education
"Privolzhsky Research Medical University"
Ministry of Health of the Russian Federation
(FSBEI HE "PRMU" of the Ministry of Health of Russia)

Department of
Name of the department

CHANGE REGISTRATION SHEET

working program for the academic discipline
NAME OF THE ACADEMIC DISCIPLINE

Field of study / specialty / scientific specialty: _____
(code, name)

Training profile: _____
(*name) - for master's degree programs*

Mode of study: _____
full-time/mixed attendance mode/extramural

Position	Number and name of the program section	Contents of the changes made	Effective date of the changes	Contributor's signature
1				

Approved at the department meeting
Protocol No. _____of _____20__

Head of the Department
_____ _____/_____
department name, academic title signature print name