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: Pharmaceutical manufacturing technology

Specialty: 33.05.01 PHARMACY

Qualification: PHARMACIST

Department: Pharmaceutical Chemistry and Pharmacognosy

Mode of study: full-time

Labor intensity of the academic discipline: 288 academic hours

Nizhny Novgorod
2021

The working program has been developed in accordance with the Federal State Educational Standard for the specialty 33.05.01_"Pharmacy", approved by the order of the Ministry of Science and Higher Education of the Russian Federation dated March 27, 2018 N 219 (Registered in the Ministry of Justice of Russia on April 16, 2018 N 50789).

Developers of the working program:
Associate Professor of the Department of Pharmaceutical Chemistry and Pharmacognosy, Ph.D. Volkov A.A.

The program was reviewed and approved at the department meeting (protocol No. 1 of 08/29/2021)

Head of the Department,
Ph.D. _____ Zhukova O.V.

29 August 2021

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

29 August 2021

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1. The purpose and objectives of mastering the academic discipline Pharmaceutical manufacturing technology

1.1. The purpose of mastering the discipline:

- universal competencies (UC 1 (1.1.-1.4.))
- general professional competencies (GPC-1 (1.3., 1.4), GPC -6 (6.2., 6.3.);
- professional competencies (PC-7 (7.1.-7.5.); PC-11 (11.1-11.3.)).

1.2. Tasks of the discipline - As a result of completing the discipline, the student should:

Know:

- requirements for maintaining subject-quantitative accounting of medicines
- requirements for maintaining reporting documentation in pharmaceutical organizations, professional office work
- classification of narcotic drugs, psychotropic, toxic chemicals, biological agents, radioactive substances and their physical and chemical characteristics;
- technology of dosage forms obtained under the conditions of pharmaceutical production: powders, collections, granules, capsules, microgranules, microcapsules, dragees, tablets, aqueous solutions for internal and external use, solutions in viscous and volatile solvents, syrups, aromatic waters, tinctures, extracts, ophthalmic dosage forms, solutions for injections and infusions, suspensions for enteral and parenteral use, emulsions for enteral and parenteral use, ointments, suppositories, patches, pencils, films, aerosols;
- technology for the manufacture of medicines in a pharmacy: powders, aqueous solutions for internal and external use, solutions in viscous and volatile solvents, ophthalmic dosage forms, solutions for injections and infusions, suspensions for entheal and parenteral use, emulsions, aqueous extracts from medicinal plant materials , complex combined preparations with a liquid dispersion medium, ointments, suppositories;
- normative documentation regulating the production and quality of medicines in pharmacies and pharmaceutical enterprises;
- nomenclature of modern excipients, their properties, purpose;
- theoretical foundations of biopharmacy, pharmaceutical factors influencing the therapeutic effect in the extemporaneous and industrial production of dosage forms
- arrangement and principles of operation of modern laboratory and production equipment;
- analysis methods used in drug quality control and described in the State Pharmacopoeia
- normative documentation regulating the manufacture, production and quality of medicines at pharmaceutical enterprises;
- technology of dosage forms obtained in the conditions of pharmaceutical production

Be able to:

- maintain reporting documentation in accordance with established requirements
- register data on manufactured drugs
- draw up basic technological and instrumental schemes for the production of finished medicines
- draw up a material balance and carry out calculations taking into account the consumption rates of the entire technological process by stages
- draw up a technological section of the industrial regulation for the production of finished dosage forms

- carry out step-by-step control at the stages of manufacturing the finished product and during dispensing; as well as standardize the dosage form for technological and biopharmaceutical indicators in accordance with the current regulatory documents
- make fragments of ND on LF
- work independently with educational and reference literature;
- ensure compliance with the rules of industrial hygiene, environmental protection, labor, safety

Possess:

- the skills of conducting subject-quantitative accounting of certain groups of drugs and other substances subject to such accounting
- skills in maintaining reporting documentation in the prescribed manner
- skills in maintaining registration of data on the manufacture of medicinal products (filling out a written control passport; in the case of using in the manufacture of drugs that are subject to quantitative accounting, registration of the reverse side of the prescription)
- basic information transformation technologies: text, spreadsheet editors; technique of working on the Internet for professional activities;
- skills in compiling technological sections of industrial regulations for the production of finished dosage forms, including technological and instrumental schemes for the production of finished dosage forms;
- develop an accounting policy, keep records of inventory items: cash and settlements, prepare reports for internal and external users of accounting information

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 **Pharmaceutical manufacturing technology** refers to the core of Block 1 of GEP HE (Academic discipline index).

The discipline is taught in the 8th and 9th semesters.

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

- general chemistry
- physical chemistry
- pharmaceutical technology
- pharmaceutical chemistry
- pharmacology
- clinical pharmacology with the basics of pharmacotherapy
- management and economics of pharmacy

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

- practice in general pharmaceutical technology (manufacturing practice)

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 code	The content of the competence (or its part)	Code and name of the competence acquisition metric	As a result of mastering the discipline, the students should:		
				know	be able to	

						possess
1.	UC-1.	Able to realize critical analysis of problem situations based on a systematic approach, develop strategy actions	UC-1.1. Analyzes the problem situation as a system identifying its components and connections between themUC-1.2. Identifies gaps in the information needed to solve a problem situation, and designs processes for their elimination UC-1.3. Critically assesses reliability of information sources, works with conflicting information from different sources UC-1.4. Develops and meaningfully argues the strategy of solving the problem situations based on the system and interdisciplinary approaches	• methodology of abstract thinking for systematization of processes and construction of cause-and-effect relationships; • modern theoretical and experimental methods for the implementation of own and borrowed results of scientific research into practice.	• abstract, analyze and synthesize the information received; • highlight and to systematize the essential properties and connections of objects, to identify the main patterns of the objects under study; • search, select and analyze information obtained from various sources in order to make the best decision at the modern scientific level, in accordance with professional tasks and the requirements of legal documents.	• methods of self-control, abstract and analytical thinking; • skills in analyzing methodological problems that arise in solving research and practical problems, including those in interdisciplinary areas; • skills of presenting an independent point of view
2.	GPC-1.	Able to use basic biological, physical-chemical, chemical, mathematical methods for the development, research and examination of medicines, the manufacture of medicinal products	GPC-1.3. Applies the basic methods of physical-chemical analysis in the manufacture of medicinal products GPC-1.4. Applies mathematical methods and performs mathematical processing of data obtained during the development of medicines, as well as research and examination of medicines and medicinal plant raw materials	•organization of a system of state control over the production and manufacture of drugs; • the main regulatory documents, production and manufacture, quality control, storage and use of medicines (domestic and international standards (GMP, GLP, GCP, GPP), pharmacopoeias, orders of the Ministry of Health of the Russian Federation, guidelines and instructions approved by the Ministry of Health of the Russian Federation) for examination using chemical, biological, physico-chemical and other methods; • pharmacopoeial methods of analysis used in the analysis of me-	• apply chemical, biological, physico-chemical and other methods of analysis during the examination of medicines.	•ensuring the process of quality control of medicines with equipment and consumables; • basic chemical, biological, physico-chemical and other methods of analysis during the examination of medicines.

				dicinal products using chemical, biological, physicochemical and other methods.		
3.	GPC-6.	Able to understand the principles of modern information technologies and use them to solve the tasks of professional activity	GPC-6.2. Performs an effective search for information necessary to solve the tasks of professional activity using legal reference systems and professional pharmaceutical databases GPC-6.3. Uses specialized software for mathematical processing of observational and experimental data in solving problems of professional activity	modern means of computing technology	use modern computer technology and basic office applications And graphic packages; evaluate way of implementing information systems and devices for solving task	methods of practical use modern computers to search information processing and fundamentals numerical methods for solving applied tasks
4.	PC-7.	Able to carry out operations related to the technological process in the production of medicines and their control	PC-7.1. Ensures the level of proper production in accordance with the applicable rules and regulations PC-7.2. Participates in all technological operations carried out in the production of medicines at pharmaceutical enterprises PC-7.3. Monitors compliance with the requirements of the technological regulations of production in order to comply with the norms of the technological process PC-7.4. Monitors compliance of the equipment and control and measuring equipment used in production with the requirements of technological documentation PC-7.5. Monitors the	requirements of regulatory documentation for the raw materials and auxiliary materials used	carry out pharmacopoeial analysis of raw materials and auxiliary materials used	methods of quality control of raw materials and auxiliary materials used

			compliance of the raw materials and excipients used with the requirements of regulatory documentation			
5.	PC-11.	Able to take part in measures to ensure the quality of medicines in industrial production	PC-11.1. Participates in events, including the preparation and verification of documents responsible for the quality of medicines PC-11.2. Provides a clear implementation and execution of the technological scheme in production, taking into account the verification of the quality indicators of the received drug, including the technological stages PC-11.3. Ensures the reliability and effectiveness of all types of quality control of the received medicinal product, primarily ensuring intrafactory control, as well as participation in state and arbitration control	• principles of search, processing, analysis and systematization of scientific information • conditions for the correct and productive formulation of problems and tasks • the most important stages of development and the most relevant areas of research in modern world and domestic science • basic laws of physics and chemistry, physical and chemical phenomena and regularities used in physical and colloidal chemistry; • the basic laws underlying analytical	• analyze and use the received information. Argumented and logically state the content of their own conclusions and conclusions • work with scientific literature, analyze the information received, highlight the main points, form primary hypotheses on the topic of scientific research • use at least 900 terminological units and terminological elements in the framework of oral and written communication; • independently work with educational, reference and scientific	• skills to logically and consistently present the material of scientific research in oral and written form. • skills of collecting, processing, analyzing and systematizing information on the research topic • methods of statistical processing of experimental results of physical-chemical, chemical, biological and biopharmaceutical studies; • skills of interpretation of the calculated values of thermodynamic functions and on their basis to predict the possibility of implementation and direction of chemical processes; • the skills of conducting scientific research to es-

				chemistry; • the main provisions of the theory of ionic equilibria as applied to reactions of acid-base, redox, precipitation and complexometric character; • scientific bases of classification, nomenclature and isomerism of organic compounds; • classification of narcotic drugs, psychotropic, toxic substances, their physical and chemical characteristics; • normative documentation regulating the production and quality of medicines in pharmacies and pharmaceutical companies; • nomenclature of industrial preparations;	literature; • carry out elementary statistical processing of experimental data in physical and chemical experiments; process, analyze and generalize the results of physical and chemical observations and measurements; apply the acquired knowledge in the study of analytical, pharmaceutical chemistry, pharmacognosy, pharmacology, toxicology, drug technology; • calculate absolute and relative errors of measurement results; • carry out informational, educational and sanitary-educational work;	tablish the relationship between physical and chemical properties and pharmacological activity; • to predict physical and chemical transformations of medicinal substances in the course of their circulation and storage; • interpret the results of the analysis, the reasons for the poor quality of medicines, indicate ways to exclude their possible poor quality; • find and use the necessary information to solve synthetic problems; • basic information transformation technologies: text, spreadsheet editors; technique of working on the Internet for professional activities; • develop a business plan; • analyze the state of property and liabilities of a

				• nomenclature of modern excipients, their properties, purpose; • modern biotechnological methods for obtaining drugs: genetic engineering, protein engineering, engineering enzymology, chromosome engineering, cell engineering; • main trends in the development of pharmaceutical technology, new directions in the creation of modern dosage forms and therapeutic systems • theoretical foundations of biopharmacy, pharmaceutical factors influencing the therapeutic effect in the extemporaneous and industrial		pharmaceutical organization and enterprise, assess the degree of risk of entrepreneurial activity; • carry out segmentation of the pharmaceutical market and select target segments; • methods for studying demand, forming an assortment and forecasting the need for drugs • health education skills

				production of dosage forms		

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

No. p / p	Competence code	Section name of the discipline	The content of the section in teaching units
1.	UC-1 GPC-1 GPC -6 PC-7 PC-11	State regulation of the manufacture and production of medicinal products.	State regulation of the manufacture and production of medicinal products.GMP rules, organization of pharmaceutical production
2.	UC-1 GPC-1 GPC -6 PC-7 PC-11	The main processes and devices of pharmaceutical technology in the production of soft dosage forms	Ointments, gels, creams, liniments, pastes Rectal and vaginal dosage forms Medical pencils
3.	UC-1 GPC-1 GPC -6 PC-7 PC-11	The main processes and devices of pharmaceutical technology in the production of transdermal therapeutic systems (TTS)	Application medicines
4.	UC-1 GPC-1 GPC -6 PC-7 PC-11	The main processes and devices of pharmaceutical technology in the production of medicinal herbal preparations (HRP, phytopreparations).	Medicinal herbal preparations (phytopreparations) Methods and apparatus for extraction extracts Oil extracts, elixirs, balms
5.	UC-1 GPC-1 GPC -6 PC-7 PC-11	The main processes and equipment of pharmaceutical technology in the production of dosage forms for parenteral use	Injectable dosage forms Production of ampoules and vials for injection dosage forms Stabilization and purification of injection solutions in factory production infusion solutions. Emulsions and suspensions for parenteral administration
6.	UC-1	Aerodisperse	Characteristics of aerosol dosage forms. Fea-

	GPC-1 GPC -6 PC-7 PC-11	dosage forms	tures of the technology for the manufacture of drugs under pressure. Devices and auxiliary materials in the manufacture of aerosols. New aerosol packages
7.	UC-1 GPC-1 GPC -6 PC-7 PC-11	The main processes and equipment of pharmaceutical technology in the production of solid dosage forms.	Pills Technological and physico-chemical characteristics of pressed materials Coated tablets Dragee. Granules Medical capsules Microcapsules and microgranules Fees
8.	UC-1 GPC-1 GPC -6 PC-7 PC-11	Prospects for the creation of new generation dosage forms and therapeutic systems.	Ways of search and development of new means. Experimental study and testing of drugs. Ways to improve traditional medicines. Biotechnology of traditional medicines and medicines of the future. Status and development prospects for the production of therapeutic systems. Phytotherapy and ways to improve the production of extraction drugs. The main directions for improving the technology and quality of ointments. The main directions of improvement of suppository drugs. New solid dosage forms of prolonged action

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

Type of educational work	Labor intensity		Labor intensity in semesters	
	volume in credit units (CU)	volume in academic hours (AH)	8	9
classroom work, including	4.2	152	66	86
Lectures (L)	1.1	40	20	20
Practicals (P)	3.1	112	46	66
Student's individual work (SIW)	2.8	100	42	58
Mid-term assessment				
exam	1	36		36
TOTAL LABOR INTENSITY	8	288		

6. Content of the academic discipline

6.1 Sections of the discipline and types of academic work

No. p / p	No. semester	Name of the section of the academic discipline	Types of educational work (in ACH)						
			L	LP	P		S	SIW	Total
1.	8	State regulation of the manufacture and production of medicinal products.GMP rules, organization of pharmaceutical production	4		10			12	36
2.	8	The main processes and devices of pharmaceutical technology in the production of soft dosage forms	8		16			12	36
3.	8	The main processes and devices of pharmaceutical technology in the production of transdermal therapeutic systems (TTS)	8		14			12	36
4.	9	The main processes and devices of pharmaceutical technology in the production of medicinal herbal preparations (HRP, phytopreparations).	4		16			12	9
5.	9	The main processes and equipment of pharmaceutical technology in the production of dosage forms for parenteral use	4		14			12	9
6.	9	Aerodisperse dosage forms	4		14			12	43
7.	9	The main processes and equipment of pharmaceutical technology in the production of solid dosage forms.	4		18			16	74
8.	9	Prospects for the creation of new generation dosage forms and therapeutic systems.	4		10			12	9
9	9	Exam							36
		TOTAL	40		112			100	288

* - 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

No. p / p	Name of lecture topics	Volume by semesters in AH	
		8	9
1.	State regulation of the manufacture and production of medicinal products.GMP rules, organization of pharmaceutical production	2	
2.	Ointments, pastes, liniments of industrial production.	2	

3.	Technological equipment for the production of ointments, pastes, gels, creams and liniments	2	
4.	Rectal and vaginal dosage forms of industrial production. Medical pencils.	2	
5.	Application medicines of industrial production. Plasters, medical adhesives.	2	
6.	Transdermal therapeutic systems, phytofilms. Types, requirements, equipment	2	
7.	The main processes of pharmaceutical technology in the production of herbal medicines (HRP, phytopreparations).	2	
8.	Methods and apparatus for extraction Medicinal herbal preparations (phytopreparations) Extracts. Oil extracts, elixirs, balms	2	
9.	Aerodisperse dosage forms. Aerosols.	2	
10.	Injectable dosage forms. Production of ampoules and vials for injection dosage forms	2	
11.	Stabilization and purification of injection solutions in factory production	2	
12.	infusion solutions. Emulsions and suspensions for parenteral administration		2
13.	Tablets as a dosage form. Classification of tablets. Basic requirements for tablets. Theoretical foundations of pressing. The main groups of excipients for tableting		2
14.	Technological and physico-chemical characteristics of pressed materials. Tablet technology (Wet granulation Dry granulation)		2
15.	Coating of tablets with shells: (Drawing coatings. Film coatings.		2
16.	Trituration tablets. Evaluation of the quality of tablets. Ways to improve tablets.		2
17.	Dragee. Granules		2
18.	Medical capsules		2
19.	Microcapsules. Ways to get. Standardization. Nomenclature		2
20.	Fees		2
21.	Prospects for the creation of new generation dosage forms and therapeutic systems.		2
	TOTAL (40 hours)	20	20

6.2.2. Thematic plan of practicals

No. p / p	Name of topics of practicals	Volume by semesters in AH	
		8	9

1.	State regulation of the manufacture and production of medicines. Pharmaceutical development. Regulation of industrial production of drugs. GMP rules.	3	
2.	Industrial regulation. Hardware and technological schemes of production. material balance.	3	
3.	Industrial production ointments	4	
4.	Liniment industrial production	3	
5.	The main groups of excipients for the production of ointments, gels, creams, pastes and liniments	3	
6.	Rectal and vaginal dosage forms industrial production	3	
7.	Rectal capsules. Production features, requirements	3	
8.	suppositoriesindustrial production. pouring method. pressing method. Features requirements process equipment	3	
9.	The main groups of excipients for the production of suppositories and rectal capsules	3	
10.	Industrial medical pencils	3	
11.	Application medicinal products of industrial production	3	
12.	Plasters. Types, requirements, equipment	3	
13.	transdermal therapeutic systems. Types, requirements, equipment	3	
14.	The main groups of excipients for the production of TTS	3	
15.	medical adhesives. Types, requirements, equipment	3	
16.	Extracts, elixirs, balms		4
17.	Static and dynamic extraction methods and apparatus		4
18.	Purification of the primary exhaust from ballast substances. Technology of highly purified phytopreparations.		4
19.	Aerodisperse dosage forms. Aerosols		4
20.	Injectable dosage forms of industrial production. Production of ampoules and vials for injection dosage forms		4
21.	Stabilization and purification of injection solutions in factory production		4
22.	Infusion solutions for industrial production. Emulsions and suspensions for parenteral administration		4
23.	Tablets as a dosage form. Theoretical foundations of pressing.		4
24.	The main groups of excipients for tableting		4
25.	Technological and physico-chemical characteristics of pressed materials.		4
26.	Tablet technology (Wet and dry granulation)		4
27.	Coating of tablets with shells: (Drawing coatings. Film coatings.		4
28.	Trituration tablets. Evaluation of the quality of tablets. Ways to improve tablets.		4

29.	Dragee. Granules		4
30.	Soft gelatin capsules. Hard gelatin capsules		4
31.	Microcapsules. Ways to get. Standardization. Nomenclature		4
32.	Prospects for the creation of new generation dosage forms and therapeutic systems.		2
	TOTAL (total - 112 hours)	46	66

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

p / no.	Types and topics of SIW	Volume by semesters in AH	
		8	9
1	Work with literary and other sources of information	22	22
2	Preparation of term papers	20	
3	Preparation of the final qualifying work		26
	TOTAL (total - 100 Ah)	42	58

6.2.5. Research work of the student.

Research work of the student - the implementation of term papers and final qualifying work. Topics of work are approved at the meeting of the department in each new academic year.

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

No. p / p	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	3	4		5	6	7
1.	8	Current	Technological processes and equipment for the manufacture of dosage forms with a liquid medium.		Test	20	10
2.	8	Current	The main processes and devices of pharmaceutical technology in the production of medicinal herbal preparations (HRP, phytopreparations).		Test	20	10
3.	8	Current	The main processes and devices of pharmaceutical		Test	20	10

			technology in the production of soft dosage forms				
4.	9	Current	The main processes and devices of pharmaceutical technology in the production of drugs from animal raw materials.		Test	20	10
5.	9	Current	Aerodisperse dosage forms		Test	20	10
6.	9	Current	The main processes and equipment of pharmaceutical technology in the production of dosage forms for parenteral use		Test	20	10
7.	9	Current	The main processes and equipment of pharmaceutical technology in the production of solid dosage forms.		Test	20	10
8.	9	final	Prospects for the creation of new generation dosage forms and therapeutic systems.		Exam	3	35

8. 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

No.	Name according to bibliographic requirements	Number of copies	
		At the department	In the library
1.	Pharmaceutical technology: Technology of dosage forms: a textbook for students. higher textbook institutions / I.I. Krasnyuk, S.A. Valevko, G.V. Mikhailova and others; ed. I.I. Krasnyuk, G.V. Mikhailova. - M.: Publishing Center "Academy", 2006. - 592 p.	4	153
2.	Workshop on the technology of dosage forms: study guide I.I. Krasnyuk, G.V. Mikhailova, O.N. Grigorieva and others; ed. I.I. Krasnyuk, G.V. Mikhailova. - M.: Publishing Center "Academy", 2006. - 432 p.		153
3.	Pharmaceutical technology. Guide to laborato-		220

	ry studies: a study guide. Bykov V.A. 2010		
4.	Pharmaceutical technology. Manufacturing of drugs: a textbook. Gavrilov A.S. 2010	2	100

8.2. Further reading

No.	Name according to bibliographic requirements	Number of copies	
		At the department	In the library
1.	Pharmaceutical homeopathy: Proc. allowance for students. higher textbook institutions / I.I. Krasnyuk, G.V. Mikhailov; Ed. ON THE. Zamarenova. - M.: Publishing Center "Academy", 2005. - 272 p.	5	
2.	Tutorial. Medical cosmetics/I.I. Krasnyuk, G.V. Mikhailova, E.T. Chizhova. - M.: Publishing Center "Academy", 2006. - 240p.	5	thirty
3.	State Pharmacopoeia of the USSR X edition, 1968.	2	
4.	USSR State Pharmacopoeia XI edition, issue 1, 1987; issue 2, 1990	8	
5.	State Pharmacopoeia XIIth ed. - Part 1.-M: Scientific Center for Expertise of Medicinal Products, 2008.-704 p.	2	
6.	State Pharmacopoeia XIIIth ed. - Volume 1, Volume 2, Volume 3.-M: Scientific Center for Expertise of Medicinal Products, 2015.	2	
7.	Order of the Ministry of Industry and Trade of the Russian Federation No. 916 dated June 14, 2013 "On Approval of the Rules of Good Practice"	20	
8.	Order of the Ministry of Health of the Russian Federation No. 751n dated October 26, 2015 "On approval of the rules for the manufacture and dispensing of drugs for medical use by pharmacy organizations, individual entrepreneurs licensed for pharmaceutical activities"	20	
9.	Order of the Ministry of Health of the Russian Federation No. 309 dated 10/21/97 on the approval of the "Instructions on the sanitary regime of pharmacies";	50	
10.	Order of the Ministry of Health and Social Development of the Russian Federation of August 23, 2010 N 706n "On approval of the Rules for the storage of medicines"	20	
11.	Order of the Ministry of Health of the Russian Federation No. 1175n dated December 20, 2012 “On approval of the procedure for prescribing and prescribing medicines, as well as forms of prescription forms for medicines, the procedure for issuing these forms, their accounting and storage”	20	
12.	Order of the Ministry of Health and Social Development of	50	

	the Russian Federation No. 110 dated February 12, 2007 "On the procedure for prescribing and prescribing medicines, medical devices and specialized health food products";		
13.	Order of the Ministry of Health of the Russian Federation No. 377 dated 11/13/96 on approval of the "Instructions for organizing the storage of various groups of medicines and medical devices in pharmacies" (valid for medical devices)	50	
14.	Sinev D.Ya., Marchenko L.G., Sineva T.D. Reference manual for pharmaceutical technology of drugs. - St. Petersburg,1992.	5	
15.	Mashkovsky M.D. medicines. - 15th edition, revised, corrected. and additional - M.: RIA "New Wave", 2007. - 1206 p.	5	

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
Internal electronic library system (VEBS)	Proceedings of the faculty of the department: textbooks and teaching aids, monographs, collections of scientific papers, scientific articles, dissertations, abstracts of dissertations, patents.	From any computer on the Internet, using an individual login and password	Not limited

8.4.2. Electronic educational resources acquired by the University

No.	Name of the electronic resource	Brief description (content)	Access conditions	Number of users
1	Electronic database "Student Advisor"	Educational literature + additional materials (audio, video, interactive materials, test tasks) for higher medical and pharmaceutical education. Editions are structured by specialties and disciplines in accordance with the current Fed-	From any computer on the Internet, using an individual login and password [Electronic resource] - Access mode:http://www.studmedlib.ru/	General subscription of PIMU

		eral State Educational Standards of Higher Professional Education.		
2	Electronic library system "Bukap"	Educational and scientific medical literature of Russian publishing houses, incl. translations of foreign publications.	From any computer located on the Internet by login and password, from the computers of the academy. Subscribed editions are available for reading. [Electronic resource] - Access mode: http://www.books-up.ru/	General subscription of PIMU
3	"Bibliopoisk"	Integrated search service "single window" for electronic catalogs, ELS and full-text databases. The results of a single search in the demo version include documents from domestic and foreign electronic libraries and databases available to the university as part of a subscription, as well as from open access databases.	For PIMU, access to the demo version of the Bibliopoisk search engine is open: http://bibliosearch.ru/pimu.	General subscription of PIMU
4	Domestic electronic periodicals	Periodicals on medical topics and higher education	From the computers of the Academy on the platform of the electronic library eLIBRARY.RU Access mode: https://elibrary.ru/	Not limited
5	International scientometric database "WebofScienceCoreCollection"	WebofScience covers materials on natural, technical, social, humanities; takes into account the mutual citation of publications developed and provided by ThomsonReuters; has built-in search, analysis and management of bibliographic	Free access from PIMU computers Access mode:http://apps.webofknowledge.com	Free access from PIMU computers

		information.		

8.4.3 Open access resources

No.	Name of the electronic resource	Brief description (content)	Access conditions
1	Federal Electronic Medical Library (FEMB)	Includes electronic analogues of printed publications and original electronic publications that have no analogues recorded on other media (dissertations, abstracts, books, magazines, etc.). [Electronic resource] - Access mode: http://neb.rf/	from any computer on the Internet
2	Scientific electronic library eLIBRARY.RU	The largest Russian information portal in the field of science, technology, medicine and education, containing abstracts and full texts of scientific articles and publications.[Electronic resource] - Access mode: https://elibrary.ru/	from any computer on the Internet.
3	Scientific electronic library of open access CyberLeninka	Full texts of scientific articles with annotations published in scientific journals in Russia and neighboring countries.[Electronic resource] - Access mode: https://cyberleninka.ru/	from any computer on the Internet
4	Russian State Library (RSL)	Abstracts for which there are copyright agreements with permission for their open publication[Electronic resource] - Access mode: http://www.rsl.ru/	from any computer on the Internet
5	Reference and legal system "Consultant Plus"	Federal and regional legislation, judicial practice, financial advice, legislative comments, etc. [Electronic resource] - Access mode: http://www.consultant.ru/	from any computer on the Internet

9. Material and technical support for mastering an academic discipline

9.1. List of premises for classroom activities for the discipline

1. An audience for lectures and practical classes, equipped with multimedia and other teaching aids that allow the use of simulation technologies, with standard sets of professional models (sets of clinical trial protocols, formulary lists of health care facilities, price lists of distribution companies, sets of quality of life questionnaires), allowing students to master the skills and abilities provided for by professional activity individually.

2.Educational films (multimedia)"Suspensions", "Emulsions", "Ointments", "Suppositories", "Infusions", "Decoctions", "Extracts", "Pills", "GMP"

3. Premises for independent work of students, equipped with computer equipment with the ability to connect to the Internet and provide access to the electronic information and educational environment of the University.

9.2. List of equipment for classroom activities for the discipline

1. Multimedia complex (laptop, projector, screen, TV)

2. Computer class (15 computers) with installed applications and Internet access.

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