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: Modern Methods of Pharmaceutical Analysis (VARIATIVE PART)

Specialty:33.05.01 PHARMACY

Qualification: PHARMACIST

Department: Pharmaceutical Chemistry and Pharmacognosy

Mode of study: full-time

Labor intensity of the academic discipline: 108 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 order of the Ministry of Science and Higher Education of the Russian Federation on March 27, 2018 N 219.

Developers of the working program:
O.A.Vorobeva, Associate Professor of the Department, PhD; D.S. Malygina, Associate Professor of the Department, Ph.D.

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

Head of the Department of Pharmaceutical Chemistry
and pharmacognosy,
Ph.D. _____ / O.V. Zhukova /

29 August 2021

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

29 August 2021

1. The purpose and objectives of mastering the academic discipline "Modern Methods of Pharmaceutical Analysis" (VARIATIVE PART)

1.1 The purpose of mastering the discipline: *participation in forming the relevant competencies* UC-1,2; PC-4,7

1.2. Tasks of the discipline:

As a result of completing the discipline, the student should

Know:

- general methods for assessing the quality of medicinal products, the possibility of using each method depending on the method of obtaining medicinal products, the raw materials, the structure of medicinal substances, and the physical and chemical processes that may occur during storage and circulation of medicinal products;
- factors affecting the quality of medicines at all stages of circulation; determination of the main factors depending on the properties of medicinal substances (redox, ability to hydrolysis, polymerization); the possibility of preventing the influence of external factors on the good quality of medicines;
- chemical methods underlying the qualitative analysis of medicines; the main structural fragments of medicinal substances, according to which the identification of inorganic and organic medicinal substances is carried out; general and specific reactions to individual cations, anions and functional groups;
- the principles underlying the physicochemical methods of drug analysis;
- equipment and reagents for chemical analysis of medicines; requirements for reagents for testing for purity, identity and quantitation; equipment and reagents for physical and chemical analysis of medicinal substances; a schematic diagram of a refractometer, photocolorimeter, spectrophotometer, gas-liquid chromatography, high-performance liquid chromatography;
- the structure of regulatory documents regulating the quality of medicines; features of the structure of the pharmacopoeial article and the pharmacopoeial article of the enterprise;
- physical and chemical constants of medicinal substances; methods for determining the melting point, rotation angle, specific absorption rate, boiling point;
- concept of validation; validation characteristics of qualitative and quantitative analysis methods;
- nomenclature of modern excipients and their properties, purpose.

Be able to:

- plan the analysis of medicines in accordance with their form according to regulatory documents and evaluate their quality according to the results obtained;
- prepare reagents, reference, titrated and test solutions, control them;
- to carry out the identification of medicinal substances by reactions to their structural fragments;
- interpret the results of UV and IR spectrometry to confirm the identity of medicinal substances;

- use various types of chromatography in the analysis of medicinal substances and interpret its results;

- to establish the quantitative content of medicinal substances in the substance and dosage forms by physical and chemical methods;

- carry out tests for the purity of medicinal substances and establish limits for the content of impurities by chemical and physico-chemical methods;

Possess:

- skills in interpreting the results of drug analysis to assess their quality; standard operating procedures for determining the order and execution of documents for the declaration of conformity of the finished product with the requirements of regulatory documents;

- skills in the use of chemical, biological, instrumental methods of analysis for the identification and determination of toxic, narcotic substances and their metabolites;

- normative, reference and scientific literature for solving professional problems.

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 "Modern Methods of Pharmaceutical Analysis" (VARIATIVE PART) refers to the core part *(*or *the part formed by the participants of educational relations)* of Block B.1V.OD.8 of GEP HE (Academic discipline index).

The discipline is taught in the 6th semester.

2.2. **The following knowledge, skills and abilities formed by previous academic disciplines are required for mastering the discipline**: *mathematics, computer science, physics, general and inorganic chemistry, physical and colloidal chemistry, analytical chemistry, organic chemistry.*

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

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

p / no.	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	UC-1.1. Analyzes the problem situation as a system	• methodology of abstract thinking for systematization of	• abstract, analyze and synthesize the information received;	• methods of self-control, abstract and analytical thinking; • skills in analyzing methodological problems that	

		critical analysis of problem situations based on a systematic approach, develop strategy actions	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 UC-1.5. Uses logical and methodological tools for critical evaluation of modern concepts of philosophical and social nature in its subject areas	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.	• 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.	arise in solving research and practical problems, including those in interdisciplinary areas; • skills of presenting an independent point of view	
2.	UC-2.	Able to manage the pro-ject at all stages of its life cycle	UC-2.1. Formulates a project task on the basis of the set problems and a method of its solutions through the implementation of the project management UC-2.2. Develops a project concept within the framework of the designated problem: formulates the purpose, tasks, justifies the relevance, significance, expected results and possible areas of their applicationUC-2.3. Plans necessary resources, including taking into account their replaceability UC-2.4. Develops a project implementation plan using planning tools UC-2.5. Monitors the progress of the project, corrects deviations, makes additional changes to the project implementation plan, clarifies zones of responsibilities of project	principles for developing a project implementation plan in the field of professional activity at all stages of its life cycle	develop a project implementation plan in the field of professional activity at all stages of its life cycle, providing for problem situations and risks	methods of planning and executing projects under conditions of uncertainty, managing the project (supporting the implementation of the project)	

			participants				
3.	PC-4.	Able to participate in monitoring the quality, effectiveness and safety of medicines and medicinal plant raw materials	PC-4.1. Conducts pharmaceutical analysis of pharmaceutical substances, excipients and medicines for medical use of factory production in accordance with quality standards PC-4.2. Performs intra-pharmacy quality control of medicines for medical use manufactured in a pharmacy organization PC-4.3. Conducts pharmacognostic analysis of medicinal plant raw materials and medicinal herbal preparations PC-4.4. Informs in accordance with the procedure established by law about the non-compliance of the medicinal product for medical use with the established requirements or about the non-compliance of the data on the effectiveness and safety of the medicinal product with the data on the medicinal product contained in the instructions for its use	•laws and legislative acts of the Russian Federation, regulatory and methodological materials of the Ministry of Health of Russia, regulating the procedure for quality control of medicines in the conditions of pharmaceutical organizations; • methods of analysis used in the quality control of drugs in the conditions of pharmaceutical organizations; • monitor drug quality assurance systems; • the process of providing equipment and consumables for quality control in the conditions of pharmaceutical organizations;	• apply chemical, physico-chemical methods of intra-pharmacy quality of drugs in the conditions of pharmaceutical organizations; • draw up documentation of the established form for the control of manufactured medicinal products in the conditions of pharmaceutical organizations; • monitor drug quality assurance systems; • provide the process of quality control in pharmaceutical organizations with equipment and consumables.	• basic chemical and physico-chemical methods of intra-pharmacy quality control of drugs in the conditions of pharmaceutical organizations; • registration of documentation of the established sample for the control of manufactured drugs in the conditions of pharmaceutical organizations.	
4.	PC-7.	Able to carry	PC-7.5. Monitors the compliance of	requirements of regulatory	carry out pharmacopoeial	methods of quality control of raw materials and auxiliary	

		out operations related to the technological process in the production of medicines and their control	the raw materials and excipients used with the requirements of regulatory documentation	documentation for the raw materials and auxiliary materials used	analysis of raw materials and auxiliary materials used	materials used	

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

p / no.	Competence code	Section name of the discipline	The content of the section in teaching units
1.	UC-1,2 PC-4,7	Elemental analysis of medicinal substances.	Determination of nitrogen, phosphorus, sulfur, halogens in organic compounds by chemical and physico-chemical methods. Unification and standardization of tests. Analysis of nitrogen-containing and oxygen-containing medicinal substances. Qualitative reactions to the main functional groups: primary, secondary and tertiary amino groups, aromatic nitro group, amide and azomethine groups; alcohol and phenolic hydroxyl, carbonyl (aldehyde and ketone), carboxyl and ester groups. Prerequisites for choosing a method that allows to quantify the content of the drug by functional groups characterizing its properties (method of acid-base titration in aqueous and non-aqueous media, complexometry, argentometry, bromatometry, iodometry, nitritometry). Features of the quantitative analysis of pharmaceutical substances and drugs. Validation of analytical methods. Weight analysis (gravimetry).
2.	UC-1,2 PC-4,7	Optical methods for the analysis of medicinal substances.	UV and IR spectrophotometry, NMR spectroscopy, photometry in the visible region of the spectrum. Methods based on radiation emission: flame photometry, fluorimetry
3.	UC-1,2 PC-4,7	Chromatographic methods for the analysis of medicinal substances.	Thin layer chromatography (TLC), HPTLC, gas liquid chromatography (GLC) and high performance liquid chromatography (HPLC).

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

Type of educational work	Labor intensity	
	volume in credit units (CU)	volume in academic hours (AH)
Classroom work, including	1.8	66

Lectures (L)	0.4	14
Practicals (P)	1.4	52
Student's individual work (SIW)	1.2	42
Mid-term assessment:		
credit		
TOTAL LABOR CAPACITY	3	108

6. **Content of the academic discipline**

6.1 Sections of the discipline and types of academic work

p / no.	Name of the section of the academic discipline	Types of academic work* (in AH)				Evaluation tools
		L	P	SIW	Total	
1.	Elemental analysis of medicinal substances.	-	12	12	24	Colloquium, interview
2.	Optical methods for the analysis of medicinal substances.	10	28	18	56	Colloquium, interview on situational tasks,
3.	Chromatographic methods for the analysis of medicinal substances	4	12	12	28	Colloquium, interview on situational tasks,
	TOTAL	14	52	42	108	

* - 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

p / no.	Name of lecture topics	Volume in Ah
1.	Theoretical and practical foundations of electron spectroscopy. Spectroscopy in the ultraviolet and visible regions of the spectrum in the analysis of drugs.	2
2.	Fundamentals of methods of vibrational spectroscopy. Spectroscopy in the infrared range in the analysis of drugs.	2
3.	Physical foundations of nuclear magnetic resonance (NMR) and PMR spectroscopy.	2
4.	Carrying out elemental analysis using physical methods. Theoretical and practical foundations of atomic emission, atomic absorption spectrometry of organic and inorganic drugs. Mass spectrometry of inorganic drugs.	2
5.	Chromatography. Types of chromatography, features of chromatographic studies. Classification by technique. Features of adsorption, distribution, ion-exchange chromatography. Application in pharmacy.	2
6.	Chromatography (gas-liquid, HPLC). Establishment of the	4

	specificity of methods of qualitative and quantitative analysis, determination of foreign impurities. Basic concepts (accuracy, correctness, precision, detection limit, robustness)	
	TOTAL (total - ACH)	14

6.2.2 Thematic plan of practicals

p / no.	Name of topics of practical classes	Volume in Ah
1.	Chemical methods of elemental analysis of medicinal substances	4
2.	Analysis of nitrogen-containing drugs	7
3.	Analysis of oxygen-containing medicinal substances	7
4.	Application of spectroscopy in the ultraviolet and visible regions of the spectrum	7
5.	Application of infrared spectroscopy	5
6.	Using NMR Spectroscopy to Confirm the Structure of a Drug	6
7.	High Performance Liquid Chromatography as a Method for the Quantitative Determination of Drugs and Impurities	8
8.	Thin layer chromatography	4
9.	Checking practical skills in the following methods: elemental analysis (chemical and physico-chemical), spectrophotometry in the UV, visible and IR regions; chromatography (TLC; HPLC, GLC)	4
10.	TOTAL	52

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

No. p / p	Types and topics of SIW	Volume in Ah
1.	Working with literary and other sources of information on the section under study	8
2.	Doing homework provided by the discipline program	10
3.	Working with electronic educational resources	8
4.	The study of material submitted for independent work	8
5.	Preparation for examinations and tests	8
	TOTAL (total 216 Ah)	42

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

No. p / p	Types of control	Name of section of academic discipline		Assessment formats		
			Competence codes	types	number of test questions	number of test task options
1	3	4		5	6	7
1.	Control of the development	Chemical methods of elemental	UC-1,2 PC-4,7	interview	3	20

	of the topic	analysis of medicinal substances				
2.	Control of the development of the topic	Analysis of nitrogen-containing drugs	UC-1,2 PC-4,7	interview	3	20
3.	Control of the development of the topic	Analysis of oxygen-containing medicinal substances	UC-1,2 PC-4,7	interview	3	20
4.	Control of the development of the topic	Electronic spectroscopy	UC-1,2 PC-4,7	interview	4	50
5.	Control of the development of the topic	Vibrational spectroscopy	UC-1,2 PC-4,7	interview		
6.	Control of the development of the topic	NMR spectroscopy	UC-1,2 PC-4,7	interview	4	52
7.	Control of the development of the topic	Chromatography (gas-liquid, HPLC).	UC-1,2 PC-4,7	interview	4	10

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.	Huynh-Ba K. Handbook of Stability Testing in Pharmaceutical Development (Regulations, Methodologies, and Best Practices) Electronic resource. - Springer, 2009. - 390 p.	Electrical version	-
2.	Jouyban A. Handbook Of Solubility Data For Pharmaceuticals Electronic resource. - CRC Press, 2010. - 554 p.	Electrical version	-
3.	Putz M. V. (Ed.) Quantum Frontiers of Atoms and Molecules[Electronic resource]. - Nova Science Publishers, 2011. - 673 p.	Electrical version	-
4.	The British Pharmacopoeia 2012. – London: The Stationery Office on Behalf of the Medicines and Healthcare Products Regulatory Agency (MHRA) [Electronic resource].	Electrical version	-

5.	The International Pharmacopoeia. 4th Edition[Electronic resource]. - WHO Pharmacopoeia Library. 2011.	Electrical version	-
6.	The United States Pharmacopeia (USP 32) and the 27th edition of the National Formulary (NF 27) [Electronic resource]. – Washington, DC: The United States Pharmacopeial Convention. 2009. - 815 p.	Electrical version	-
7.	The Japanese Pharmacopoeia Sixteenth Edition[Electronic resource]. – Tokyo, The Committee on Japanese Pharmacopoeia, 2011. 2326 p.	Electrical version	-

8.2. Further reading

No.	Name according to bibliographic requirements	Number of copies	
		At the department	In the library
1.	Baks E. Two-dimensional nuclear magnetic resonance in a liquid[Electronic resource].- Novosibirsk: Nauka, 1989.	Electrical version	-
2.	Ernst R. et al. NMR in one and two dimensions[Electronic resource], 1990	Electrical version	-
3.	Nakanishi K. IR spectra and structure of organic compounds. Practical guide[Electronic resource], 1965	Electrical version	-
4.	Vasiliev V.P. Analytical chemistry. Physical and chemical methods of analysis, vol. 2[Electronic resource], 1989	Electrical version	-
5.	Kazitsyna L.A., Kupletskaya N.B. Application of UV, IR and NMR spectroscopy in organic chemistry[Electronic resource], 1971	Electrical version	-
6.	Bulatov M.I., Kalinkin I.P. A Practical Guide to Photometric Methods of Analysis[Electronic resource], 1986	Electrical version	-
7.	Belikov VG Pharmaceutical chemistry : textbook / VG Belikov . - 4th ed., revised. and additional .. - M .: MEDpress-inform, 2007. - 615 p.	-	247
8.	Belikov VG Pharmaceutical chemistry : textbook / VG Belikov . - 4th ed., revised. and additional .. - M .: MEDpress-inform, 2008. - 615 p.		219
9.	Pharmaceutical chemistry: textbook / ed.A. P. Arzamastsev. - 2nd ed., Rev. - M. : GEOTAR-Media, 2005. - 640 p.	1	29 + Student Advisor
10.	Pharmaceutical Chemistry: Study Guide[Electronic resource]/ ed.A. P. Arzamastsev. - 2nd ed., Rev. - M. : GEOTAR-Media, 2005. - 640 p.		Student Advisor
11.	Cross A.D. Introduction to practical infrared spectroscopy - Translated from English. □Electronic resource□. - M .: Foreign literature, 1961. - 110 p.	Electrical version	-
12.	NMR Spectroscopy in Pharmaceutical Analysis □Electronic resource□, 2008, p.494	Electrical version	-
13.	NMR Spectroscopy in Drug Development and	Electrical	-

	Analysis □Electronic resource□, 1999, p.311	version	
14.	Structure Determination of Organic Compounds□Electronic resource□, 2009	Electrical version	
15.	Garmash A.V. Introduction to spectroscopic methods of analysis. Optical methods of analysis □Electronic resource□, 1995	Electrical version	-
16.	Deroum E. Modern NMR methods for chemical research □Electronic resource□, 1992	Electrical version	-
17.	Vasiliev A.V. et al. IR spectroscopy org. and natural compounds □Electronic resource□, 2007	Electrical version	-
18.	Ahuja S., Scypinski S. (eds.) Handbook of Modern Pharmaceutical Analysis □Electronic resource□ . - Academic press, 2001. - 587 p.	Electrical version	-
19.	Ermer J., Miller JHMcB. Method validation in pharmaceutical □Electronic resource□. - Wiley-VCH, 2005. - 411 p.	Electrical version	-
20.	Andersen GM, Markham KR (ed.) Flavonoids (chemistry, biochemistry and applications) □Electronic resource. - Taylor & Francis, 2006. - 1212 p.	Electrical version	-

8.4. Electronic educational resources for teaching academic subjects

8.4.1. 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 teaching staff of the Academy: 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.	DB “Medicine. Healthcare (HPE)" (EBS "Student Consultant")	Educational literature + additional materials (audio, video, interactive materials, test tasks) for higher medical and pharmaceutical education	from any computer on the Internet, using an individual login and password	Not limited
2.	Electronic library system «BookUp»	Educational and scientific medical	from university computers; from any	Not limited

		literature of Russian publishing houses, incl. translations of foreign publications	computer on the Internet using an individual login and password Subscribed editions are available for reading.	
3.	Electronic Medical Library "Doctor's Consultant"	National guidelines in all areas of medicine, clinical guidelines, textbooks, monographs, atlases, pharmaceutical reference books, audio and video materials, ICD-10 and ATC, recent publications in foreign journals with brief annotations in Russian	from any computer on the Internet, using an individual login and password	Not limited
4.	Domestic electronic periodicals	Medical periodicals	from the university computers on the platform of the SCIENTIFIC electronic library eLIBRARY.RU Subscribed editions are available for reading.	Not limited
5.	DB Medline Complete	Foreign full-text database of articles from scientific periodicals and collections of medical and natural science topics	from university computers; from any computer on the Internet, using an individual login and password	Not limited
6.	Springer Electronic Collection	Full-text scientific publications (journals, books, articles, scientific protocols, conference materials, etc.) in the natural sciences, medical sciences and the humanities	from university computers	Not limited
7.	Electronic collection "Freedom" on the Science Direct platform	Books and periodicals of the publishing house "Elsevier" in the natural sciences, medicine and humanities	from university computers	Not limited
8.	DB Scopus	International Science Citation Abstract Database	from university computers	Not limited

9.	DB Web of Science Core Collection	International Science Citation Abstract Database	from university computers; from any computer on the Internet, using an individual login and password	Not limited
10.	DB Questel Orbit	Questel Patent Database	from university computers	Not limited

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.).	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.	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.	from any computer on the Internet
4.	Russian State Library (RSL)	Abstracts for which there are copyright agreements with permission for their open publication	from any computer on the Internet
5.	Reference and legal system "Consultant Plus"	Federal and regional legislation, judicial practice, financial advice, legislative comments, etc.	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. A specialized laboratory equipped with a standard set of equipment for pharmaceutical analysis of medicinal substances, as well as dosage forms based on them.

2. Audience equipped with presentation equipment: projector, screen, laptop.

9.2. List of equipment for classroom activities for the discipline

1. A set of electronic presentations;

2. A set of equipment for chemical and toxicological analysis: laboratory tables, exhaust ventilation, laboratory glassware;

3. HPLC chromatograph

4. Gas chromatograph

5. Chromatomass spectrometer

6. Spectrophotometer

7. IR spectrometer

8. Analyzer for polarization fluoroimmunoassay

9. Chromatographic chambers, detection chambers and other equipment for TLC

10. Photomineralizer

11. Ion potentiometer

12. Polarograph
13. Apparatus for determining the melting point
14. Ultrathermostat
15. Ultrasonic bath
16. Centrifuge
17. Drying cabinet
18. Muffle Furnace
19. Water distiller
20. Moisture Analyzer
21. Analytical balance
22. Dry-air thermostat
23. Thermal bath
24. Single channel evaporator

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	170	Office Applica-tion	Microsoft		23618/HN10030 LLC "Softline Trade" from

	"PIMU" of the Ministry of Health of Russia					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