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: INFORMATICS

Specialty 33.05.01 PHARMACY

Qualification: PHARMACIST

Department: INFORMATION TECHNOLOGY

Mode of study: FULL-TIME

Labor intensity of the academic discipline: 108 academic hours

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 Health and Social Development of the Russian Federation No. 219 dated of March 27, 2018.

Developers of the working program:

Borisov Igor Borisovich Associate Professor of the Information Technology Department FSBEI HE PRMU MOH Russia, Candidate of Biological Sciences

The program was reviewed and approved at the department meeting (protocol No. 01 June 2021,

Head of the Department,

Candidate of Biological Sciences, Associate Professor

Signature)

Bavrina Anna Petrovna

(signature)

01 June 2021

Deputy Head of EMA ph.d. of biology _

01 June 2021

- **1.** The purpose and objectives of mastering the academic discipline *informatics* (hereinafter the discipline):
- 1.1. The purpose of mastering the discipline: is to form systemic fundamental knowledge about the use of modern information technologies in medicine and the field of healthcare organization for the collection, storage, processing and analysis of biomedical information, which is necessary to improve the quality of medical care to the population in the professional practice of a pharmacist. (*participation in forming the relevant competencies*).
 - 1.2. Tasks of the discipline:
 - -to form students' knowledge about the basic approaches of health informatization;
- -to study mathematical methods, software and technical means of information technologies used at various stages of obtaining and analyzing biomedical information;
- to familiarize students with modern computer technologies for processing and analyzing medical data used in medicine and healthcare;
 - to teach how to use Internet resources to search for medical and biological information.
 - 1.3. Requirements to the deliverables of mastering the discipline

As a result of completing the discipline, the student should

Know: 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

Be 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 activity, taking into account the basic requirements of information security

Possess: the practical experience in the use of modern 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

- 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 informatics refers to the core part of Block 1 of GEP HE (Academic discipline index).

The discipline is taught in first and second semesters of 1 year of study.

- 2.2. The following knowledge, skills and abilities formed by previous academic disciplines are required for mastering the discipline:
 - 1.Mathematics:
 - 2.Physics;
 - 3. Biophysics.
- 2.3. Mastering the discipline is required for forming the following knowledge, skills and abilities for subsequent academic disciplines:
 - 1.Biology;
 - 2.Biochemistry;
 - 3. Physiology with the basics of anatomy;
 - 4. Microbiology;
 - 5. Pharmacology;

3. Deliverables of mastering the academic discipline and metrics of competence acquisition.Mastering the discipline aims at acquiring the following general professional competencies

(GPC) and professional competencies (PC)

(0)		•	mpetencies (FC)		1. 2	
	Com	The content	Code and name of the		ult of mast	•
No	pete	of the	competence acquisition metric	discipline,	the studer	nts should:
31=	nce	competence	(CAM)	know	be able	possess
	code	(or its part)	(C/ HVI)	KIIOW	to	possess
1	GPC	Able to	CAM-6.1 _{GPC-6.} Applies modern	modern	use	effective
	-6.	understand	information technologies in the	informati	speciali	search for
		the	interaction with parties to the	on	zed	informati
		principles of	circulation of medicinal products	technolo	softwar	on
		modern	taking into account the	gies in	e for	necessary
		information	requirements of information	the	mathem	to solve
		technologies	security	interactio	atical	the tasks
		and use them	CAM-6.2 _{GPC-6} . Performs an	n with	processi	of
		to solve the	effective search for information	parties to	ng of	professio
		tasks of	necessary to solve the tasks of	the	observa	nal
		professional	•	circulatio	tional	activity
		_	professional activity using legal			•
		activity	reference systems and	n of	and	using
			professional pharmaceutical	medicina	experim	legal
			databases	1	ental	reference
			CAM-6.3 _{GPC-6} . Uses specialized	products	data in	systems
			software for mathematical	taking	solving	and
			processing of observational and	into	problem	professio
			experimental data in solving	account	s of	nal
			problems of professional activity	the	professi	pharmace
			CAM-6.4 _{GPC-6.} Applies	requirem	onal	utical
			automated information systems in	ents of	activity	databases
			the internal processes of the	informati		
			pharmaceutical organization, as	on		
			well as for interactions with	security		
			customers and suppliers			
2	PC-	Able to carry	CAM-3.1 PC-3. Provides	How to	Provide	Using
	3	out	information and consulting	inform	informa	medical
		pharmaceuti	assistance to visitors of a	medical	tion and	and
		cal	pharmacy organization when	professio	consulti	pharmace
		information	choosing medicines and other	nals	ng	utical
		and	products of the pharmacy	about	assistan	informati
		consulting	assortment, as well as on	medicine	ce to	on
		during the	questions of their rational use	s, their	visitors	systems
		release and	CAM-3.2 _{PC-3} . Informs medical	synonym	of a	and
		sale of	professionals about medicines,	s and	pharma	databases
		medicines	their synonyms and analogues,	analogue	су	in the
	for medical		possible side effects and	s,	organiz	implemen
		use and other	interactions	possible	ation	tation of
		products of	CAM-3.3 _{PC-3} . Decides on the	side	when	pharmace
		the	replacement of the prescribed	effects	choosin	utical
				and		
		pharmacy	drug with synonymous or similar		g madiain	informing
		assortment,	drugs in the prescribed manner	interactio	medicin	and
		including	based on information about	ns	es and	consultin
		with the use	groups of drugs and synonyms		other	g during

of medical	within the same international	product	the
and	nonproprietary name and prices	s of the	release
pharmaceuti	for them	pharma	and sale
cal	CAM-3.4 _{PC-3} . Uses medical and	cy	of
information	pharmaceutical information	assortm	medicines
systems and	systems and databases in the	ent, as	for
databases	implementation of	well as	medical
	pharmaceutical informing and	on	use and
	consulting during the release and	questio	other
	sale of medicines for medical use	ns of	pharmacy
	and other pharmacy products	their	products
		rational	
		use	

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

tile	7111		
№	Competen ce code	Section name of the discipline	The content of the section in teaching units
1	GPC-6; PC-3.	Informatics	 Statistical algorithms for processing of empirical data. Principles of creating computer models. Probabilistic methods in medicine. Basic concepts of computer communication networks. Concepts of local, corporate, regional and global networks. Internet information resources. Basic concepts about the structure and organization of databases (DB) and database management system (DBMS) on the example of MS Access relational DBMS. Principles of presentations making.

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

5. Volume of the academic discipline and types of academic work								
Type of educational work	Labor intensity				Labor intensity			
	volume in credit	volume	in	(A)	AH) in semesters			
	units (CU)	academic	hours	1	2	3	4	
		(AH)						
Classroom work, including								
Lectures (L)	0,39	14			7	7		
Laboratory practicum (LP)*	1,44	52			26	26		
Practicals (P)								
Seminars (S)								
Student's individual work (SIW)	1,17	42			21	21		
Mid-termassessment								
credit/exam (specify the type)								
TOTAL LABOR INTENSITY	3	108			54	54		

6. Content of the academic discipline

6.1. Sections of the discipline and types of academic work

$N_{\underline{0}}$	Name of the section of the academic	Types of academic work* (in AH)					
	discipline	L	LP	P	S	SIW	total
1	Informatics	4	12			16	32
2	Medical Informatics	10	40			26	76

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

No	Name of lecture topics	Volume in AH		
		semester 2	semester 3	
1	Computer architecture.	2		
2	Software.	2		
3	Informatics, medical informatics.	2		
4	Local Area Network.		2	
5	Wide Area Network.		2	
6	Malicious Software.		2	
7	Information security of a medical institution.		2	
	TOTAL (total - AH)		14	

6.2.2. The thematic plan of laboratory practicums.

No	Name of laboratory practicums	Volume in A	Н
		semester 2	semester 3
1	Introduction to Open Office Org. Calc.	3	
2	Correlation and regression in business and in medical activity.	3	
3	Estimating Null hypothesis. Student t-test.	3	
4	Statistical distributions. Normal distribution. Binomial distribution.	3	
	Poisson distribution.	_	
5	Control work. Estimating of smoking status.	3	
6	Mathematical modeling of physiological processes in medicine. Pharmacokinetic models. Single-chamber models.	3	
7	Pharmacokinetic models. Two-chamber models.	3	
8	Probabilistic methods of differential diagnosis. Bayes' formula.	3	
9	Operative characteristics of diagnostic signs and symptoms Part 1.		3
10	Operative characteristics of diagnostic signs and symptoms Part 2.		3
11	Estimating of heart rate variability (HRV).		3
12	Blood pressure monitoring (BPM).		3
13	Database 1. Creating database tables and forms.		3
14	Database 2. Creating databasequeries and reports.		3
15	Principle of creation of a presentation.		3
16	Revision of the presentation.		3
17	Student reports on presentations.		3
	Credit		1
	TOTAL (total - AH)		52

6.2.3. Thematic plan of practicals

№	Name of the topics of practicals	Volume in AH		
		semester	semester	
	Not provided.			
	TOTAL (total - AH)			

6.2.4. Thematic plan of seminars

№	Name of seminar topics	Volume in AH		
		semester	semester	
	Not provided.			
	TOTAL (total - AH)			

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

No	Name of laboratory practicums	Volume in A	Н
		semester 2	semester 3
1	Introduction to Open Office Org. Calc.	2	
2	Correlation and regression in business and in medical activity.	3	
3	Estimating Null hypothesis. Student t-test.	3	
4	Statistical distributions. Normal distribution. Binomial distribution. Poisson distribution.	3	
5	Control work. Estimating of smoking status.	0	
6	Mathematical modeling of physiological processes in medicine. Pharmacokinetic models. Single-chamber models.	3	
7	Pharmacokinetic models. Two-chamber models.	3	
8	Probabilistic methods of differential diagnosis. Bayes' formula.	2	
9	Operative characteristics of diagnostic signs and symptoms Part 1.		2
10	Operative characteristics of diagnostic signs and symptoms Part 2.		2
11	Estimating of heart rate variability (HRV).		2
12	Blood pressure monitoring (BPM).		2
13	Database 1. Creating database tables and forms.		3
14	Database 2. Creating database queries and reports.		2
15	Principle of creation of a presentation.		5
16	Revision of the presentation.		5
	TOTAL (total - AH)		42

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

	Se			Name of section	Compet	Assessment formats		
№	me ster No.	Types of o	control	of academic discipline	ence	types	number of test questions	number of test task options
1.	1	Current monitori ng	Control of mastering the topic	Introduction to Open Office Org. Calc.		Performing a practical task. Control questions on topic		
2	1	Current monitori ng	Control of mastering the topic	Correlation and regression in business and in medical activity.		Performing a practical task. Control questions on topic		
3	1	Current monitori ng	Control of mastering the topic	Estimating Null hypothesis. Student t-test.		Performing a practical task. Control questions on topic		
4	1	Current monitori ng	Control of mastering the topic	Statistical distributions. Normal distribution. Binomial distribution. Poisson distribution.		Performing a practical task. Control questions on topic		

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				_	reports.	topic

15	2	Current monitori ng	Control of mastering the topic	Principle of creation of a presentation.	Performing a practical task. Control questions on topic
16	2	Current monitori ng	Control of mastering the topic	Revision of the presentation.	Performing a practical task. Control questions on topic
17	2	Mid- term assessm ent	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

	6.1. Key include references		
		Number of	copies
$N_{\underline{0}}$	Name according to bibliographic requirements	at the	in the
		department	library
	Omelchenko, V. P.		
	Medical Informatics : textbook : учебник / V. P. Omelchenko, A. A.		
	Demidova; Omelchenko V. P.; Demidova A. A. – Москва:		
1	ГЭОТАР-Медиа, 2021. – 480 с. – ISBN 978-5-9704-6389-5. – Текст	1	
	: электронный. – URL:		
	https://www.studmedlib.ru/book/ISBN9785970463895.html – Режим		
	доступа: по подписке.		
	Omelchenko, V. P.		
	Medical Informatics : учебник / V. P. Omelchenko, A. A. Demidova		
2	; Omelchenko V. P. ; Demidova A. A. – Москва : ГЭОТАР-Медиа,		
2	2020. – 480 с. – ISBN 978-5-9704-5585-2. – Текст : электронный. –		
	URL: https://www.studentlibrary.ru/book/ISBN9785970455852.html		
	Режим доступа: по подписке.		
	Compiled, B. S.		
	Medical informatics for medical school students in EnglishL: lecture		
3	course / b. S. compiled, N. M. Popova; Compiled B. S., Popova N.		
	М. – Ижевск : ИГМА, 2020. – 56 с. – Текст : электронный. – URL:		
	https://e.lanbook.com/book/245366 — Режим доступа: по подписке.		
	Medical informatics: manual for students of higher education		
	institutions studying in the specialty 1-79 01 01 "General Medicine" /		
4	С. И. Клинцевич, Е. П. Наумюк, В. М. Завадская [et al.]; С. И.		
	Клинцевич, Е. П. Наумюк, В. М. Завадская, Т. Н. Сакович, А. В.		
	Копыцкий. – Гродно : ГрГМУ, 2020. – 108 с. – ISBN		
	9789855952979. – Текст : электронный. – URL: <u>https://www.books-</u>		
	<u>up.ru/ru/read/medical-informatics-13570186/</u> – Режим доступа: по		
	подписке.		

		Number of copies		
$N_{\underline{0}}$	Name according to bibliographic requirements	at the	in the	
		department	library	
	Bland, M.			
1	An introduction to medical statistics / M. Bland ; Bland, Martin. –	1		
1	3rd ed. – New York: Oxford University Press, 2005. – XVI, 405 p. –	1		
	ISBN 9780192632692.			
	Bland, M.			
2	An Introduction to Medical Statistics / M. Bland ; Bland, Martin. —	118		
2	3rd ed. – New York; London: Oxford University Press, 2000. – 405	110		
	р. : мяг. – ISBN 0-19-263269-8.			
3	Clinical Research Informatics / edited by L. R. Rachel, J. E.	80		
3	Andrews. – Springer, 2012. – 419 p. – ISBN 978-1-84882-447-8.	80		
	Coiera, E.			
4	Guide to health informatics / E. Coiera; Coiera Enrico. – 2nd. –	4		
	Arnold, 2003. – ISBN 978-0-340-76425-1.			

8.3. Electronic educational resources for teaching academic subjects 8.3.1. Internal Electronic Library System of the University (IELSU)

No॒	Name of the electronic	Brief description	Access conditions	Number of
	resource	(content)		users
	Internal Electronic	Full-text database of	From any computer and	not limited
	Library System of the	educational and	mobile device located	
	University (IELSU)	scientific publications.	on the Internet, by	
	http://81.18.133.188/logi	Main content: the	password and login	
	<u>n.php</u>	works of PRMU		
		employees		

8.3.2. Electronic educational resources acquired by the University

№	Name of the electronic	Brief description	Access conditions	Number of
	resource	(content)		users
	Database «Медицина.	Educational literature	From any computer	not limited
	Здравоохранение (ВПО)»	and additional materials	and mobile device	
1	(ЭБС «Консультант	(audio, video, interactive	located on the	
1	студента»)	materials, test tasks) for	Internet, by	
	http://www.studmedlib.ru/	higher medical and	password and login	
		pharmaceutical education		
	Database «Консультант	Scientific medical	From any computer	not limited
	врача. Электронная	publications (national	and mobile device	
2	медицинская	guidelines, clinical	located on the	
	библиотека»	recommendations,	Internet, by	
	http://www.rosmedlib.ru/	monographs, etc.)	password and login	
	Electronic Library System	Scientific and	From any computer	not limited
	«BookUp»	educational medical	and mobile device	
3	https://www.books-up.ru/	literature of Russian	located on the	
3		publishers, including	Internet, by	
		translations of foreign	password and login	
		publications		
4	Integrated Information and	Electronic copies of	From any computer	not limited

	Library System (ELS) of	publications from the	and mobile device	
	the scientific and	collections of libraries	located on the	
	educational medical cluster	participating in the	Internet, by	
	ПФО «Средневолжский»	cluster (medical	password and login	
	https://pimunn.ru/lib#rec64	universities of Kazan,		
	<u>131355</u>	Perm, Izhevsk, Kirov;		
		Ulyanovsk State		
		University).		
	Electronic periodicals	Russian electronic	From any computer	not limited
	1. on the base of	periodicals on medicine	and mobile device	
	eLIBRARY.RU:	and biology	located on the	
	https://elibrary.ru/projects/s		Internet, by	
5	ubscription/rus_titles_open.		password and login	
	asp			
	2. on the base of East			
	View:			
	https://dlib.eastview.com/b			
	<u>rowse</u>			

8 3 3 Open access resources

8.3	.3 Open access resources		
№	Name of the electronic resource	Brief description (content)	Access conditions
1	Federal Electronic Medical Library http://feml.scsml.rssi.ru/feml	Full-text electronic copies of printed publications, and independent original electronic publications on medicine and biology	From any computer and mobile device located on the Internet
2	Scientific Electronic Library eLIBRARY.RU https://elibrary.ru/defau ltx.asp	The Russian information portal in the field of science, technology, medicine and education, containing abstracts and full texts of scientific publications, including electronic versions of Russian scientific journals.	From any computer and mobile device located on the Internet
3	Open Access Scientific Electronic Library "КиберЛенинка" https://cyberleninka.ru/about	Full texts of scientific articles with annotations published in scientific journals of Russia and neighboring countries	From any computer and mobile device located on the Internet
4	National Electronic Library <u>https://нэб.рф/</u>	Full-text electronic copies of works on a wide range of knowledge.	From any computer and mobile device located on the Internet. Works restricted by copyright are available only from the computers of the scientific library.

9. Material and technical support for mastering an academic discipline
The material and technical base (rooms), which ensures the implementation of the Program on the basis of the University, complies with the current sanitary and technical standards, as well as fire safety standards and rules.

- 9.1. List of premises for classroom activities for the discipline Classrooms for practical classes equipped with computers and multimedia projector.
- 9.2. List of equipment for classroom activities for the discipline Lecture hall equipped with multimedia equipment and microphone.

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

Ite m no.	Software	number of licenses	Type of software	Manufacture r	Number in the unified register of Russian software	Contract No. and date
1	Wtware	100	Thin Client Operating System	Kovalev Andrey Alexandrovic h	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 TECHNOLO GIES"	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 Subscriptio n	
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/HN100 30 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 **Information technology**

CHANGE REGISTRATION SHEET

working program for the academic discipline

Informatics

Field of study / specialty / scientific specialty: 33.05.01 Pharmacy

(code, name)

Training profile: **Pharmacist**

(name) - for master's degree programs

Mode of study: Full-time

full-time/mixed attendance mode/extramural

Position	Number and name of	Contents of the changes made	Effective date of	Contributor's
	the program section		the changes	signature
1				
2				
3				
4				
5				

Approved at the department meeting	
Protocol Noof20	
Head of the Department of Information technology	
Candidate of Biological Sciences, Associate Professor /	Bavrina A.P.