

**FEDERAL STATE BUDGET EDUCATIONAL INSTITUTION  
OF HIGHER EDUCATION  
"ROSTOV STATE MEDICAL UNIVERSITY"  
MINISTRY OF HEALTH OF THE RUSSIAN FEDERATION**

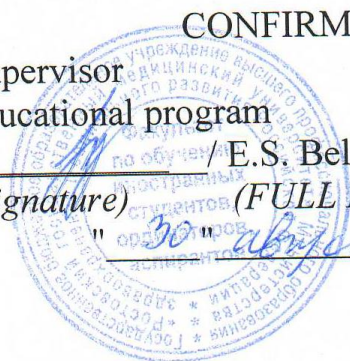
*Faculty of Education of foreign students, residents and postgraduates*

**CONFIRM**

Supervisor  
educational program

\_\_\_\_\_/ E.S. Belousova /  
(signature) (FULL NAME.)

" 30 " *август* 2022



**DISCIPLINE WORKING PROGRAM**

**MEDICAL INFORMATICS AND STATISTICS**

Speciality 31.05.01 General medicine

Form of education full-time

## I. GOALS AND OBJECTIVES OF MASTERING THE DISCIPLINE

**Target** mastering the discipline “Medical Informatics”: provide information about modern information technologies used in medicine and healthcare; study the principles of storage, retrieval, processing and effective use of biomedical information, data and knowledge to solve problems and make decisions using computer technology.

**Tasks** disciplines "Medical informatics":

-give students information about modern computer technologies used in medicine and healthcare;

- to form students' knowledge about methods of informatization of medical practice, automation of clinical trials, computerization of management in the healthcare system;

- train students to use standard and special software for solving problems in medicine and healthcare, computer mathematics systems, means of information support for medical decisions, automated medical-technological systems.

- to train students in the ability to organize and implement practical medical activities using information technologies for the development of modern society.

## II. REQUIREMENTS FOR THE RESULTS OF MASTERING THE DISCIPLINE

The process of studying the discipline is aimed at developing the following competencies in accordance with the Federal State Educational Standard of Higher Education and the EP of Higher Education in this specialty:

**a) general cultural (OK): OK-1** ability for abstract thinking, analysis, synthesis.

**b) general professional (OPK): OPK-1** willingness to solve standard problems of professional activity using information, bibliographic resources, medical and biological terminology, information and communication technologies and taking into account basic information security requirements

**OPK-7** readiness to use basic physical, chemical, mathematical and other natural science concepts and methods when solving professional problems

## III. THE PLACE OF DISCIPLINE IN THE STRUCTURE OF EP VO

2.1. The academic discipline belongs to the basic part of the specialty program and is mandatory for students to master.

2.2. The formation of the above competencies is facilitated by the study of the following previous disciplines “Physics. Mathematics”.

2.3. The discipline Medical Informatics creates the prerequisites for the formation of these competencies in the following disciplines: epidemiology; public health and healthcare organization.

#### IV. CONTENT AND STRUCTURE OF DISCIPLINE

Labor intensity of the discipline in 3 \_\_\_\_\_hour\_108\_\_\_\_\_

##### 4.1. Sections of the discipline studied in the 2nd semester

Section no.	Section name	Number of hours					
		Total	Independent work of students under the guidance of a teacher				SRS
			L	WITH	ET C	LR	
Semester 2							
1	Concept of information. General characteristics of the processes of collecting, transmitting, processing and storing information. Methods and means of informatization in medicine and healthcare	28	2		12		14
2	Basic information conversion technologies	33	4		15		14
3	Modeling of physiological, morphological, molecular genetic and biochemical processes	eleven	2		3		6
4	Automated medical and technological systems for clinical laboratory, scientific research and functional diagnostics.	eleven	2		3		6
5	Information systems of medical institutions	14	2		6		6
6	Information support of the diagnostic and treatment process. Telecommunication technologies and Internet resources in medicine. Telemedicine	eleven	2		3		6
	Interim certification form (test/test with assessment/exam)		TEST				
	<b>Total for the discipline:</b>	<b>108</b>	<b>14</b>		<b>42</b>		<b>52</b>

**SRS**- independent work of students

**L**- lectures

**WITH**– seminars (in accordance with the RUP)

**LR** –laboratory work (in accordance with the RUP)

ETC– practical exercises (in accordance with the RUP)

#### 4.2. Independent work of students under the guidance of a teacher

##### Lectures

<b>Section number</b>	<b>No. lectures</b>	<b>Lecture topics</b>	<b>Number of hours</b>
Semester 2			
1	1	Introduction to general and medical informatics	2
2	2	Information systems software	2
2	3	Computer hardware	2
3	4	Expert systems in medicine. Modeling in medicine.	2
4	5	Medical instrumentation and computer systems	2
5	6	Medical information systems	2
6	7	Informatization of the medical technological process in a medical institution. Telemedicine.	2
<i>Total hours discipline:</i>			<b>14</b>

##### Practical work

<b>Section number</b>	<b>No. PR</b>	<b>Topics of practical work</b>	<b>Number of hours</b>	<b>Shapes of the current control</b>
Semester 2				
2	1.	Introductory lesson. Functionality of modern operating systems.	3	Checking educational materials via electronic
2	2.	Information technologies for creating text documents using Microsoft Office Word	3	Checking educational materials via electronic
2	3.	Information technologies for preparing presentations using Microsoft Office Power Point	3	Checking educational materials via electronic mail
1	4.	<b>Colloquium 1 “General Informatics I”</b>	3	Testing, solving situational problems
1	5.	Seminar “Fundamentals of Medical Informatics”	3	Checking educational materials via electronic

2	6.	Information technologies for creating spreadsheets and methods for managing them using Microsoft Office Excel	3	Checking training materials via email
2	7.	Database management system dataMicrosoft Access	3	Checking educational materials via electronic mail
1	8.	<b>Colloquium 2 “General Informatics II”</b>	3	Testing, solving situational problems
4	9.	Medical instrument and computer systems. Automation of functional research in medicine.	3	Checking educational materials via electronic mail
6	10.	Intelligent systems in medicine. General issues of modeling medical and biological processes. Expert systems.	3	Checking training materials via email
3	elev en.	Modeling hemodynamics in an elastic vessel (Frank model)	3	Checking educational materials via electronic mail
5	12.	Seminar on medical information systems.	3	Checking educational materials via electronic mail
5	13.	Introduction to Karelian Medicalinformational system. Automated quality assessment of medical laboratory tests	3	Checking training materials via email
1	14.	<b>Colloquium 3 “Medical Informatics”</b>	3	Testing
<i>Total hours discipline:</i>			<b>42</b>	

### 4.3. Independent work of students

No. section a	Type of independent work of students	Number of hours	Shapes of the current control
Semester 2			
1	Studying theory, preparing for current classes, preparation control	14	Abstract. Colloquium
2	Studying theory, preparing for current classes, preparing for a test lesson, creating a presentation	14	Checking training materials via email
3	Studying theory, preparing for current classes, preparing for a test lesson	6	Checking training materials via email
4	Studying theory, preparing for current classes, preparing for a test lesson	6	Checking training materials via email
5	Studying theory, preparing for current classes, preparing for a test lesson	6	Checking training materials via email
6	Studying theory, preparing for current classes, preparing for a test lesson.	6	Checking training materials via email
<i>Total hours discipline:</i>		<b>52</b>	

## V. ASSESSMENT FUND FOR CURRENT CONTROL AND INTERMEDIATE CERTIFICATION

The fund of assessment tools for determining the level of development of competencies as a result of mastering the discipline is an appendix to the work program.

## VI. EDUCATIONAL AND METHODOLOGICAL SUPPORT OF DISCIPLINE

### 6.2. Internet resources

Omelchenko V.P., Medical informatics [Electronic resource]: textbook / V.P. Omelchenko, A.A. Demidova. - M.: GEOTAR-Media, 2016. - 528 p. Access from EBS  
 "Student Consultant": <http://www.studmedlib.ru/book/ISBN9785970436455.html>

Omelchenko V.P., Computer Science. Workshop [Electronic resource] / Omelchenko V.P., Demidova A.A. - M.: GEOTAR-Media, 2016. - 336 p. Access from EBS "Student Consultant": <http://www.studmedlib.ru/book/ISBN9785970439500.html>

	<b>ELECTRONIC EDUCATIONAL RESOURCES</b>	<b>Access to the resource</b>
1.	<b>Digital library RostSMU.</b> – URL: <a href="http://109.195.230.156:9080/opacg/">http://109.195.230.156:9080/opacg/</a>	Unlimited access
2.	<b>Student Advisor: EBS.</b> – Moscow: LLC “IPUZ”. - URL: <a href="http://www.studmedlib.ru">http://www.studmedlib.ru</a>	Unlimited access
3.	<b>Consultant Plus</b> : legal system. - URL: reference <a href="http://www.consultant.ru">http://www.consultant.ru</a>	Access from computers university
4.	<b>Scientific electronic library eLIBRARY.</b> - URL: <a href="http://elibrary.ru">http://elibrary.ru</a>	Openaccess s
5.	<b>National Electronic Library.</b> - URL: <a href="http://neb.rf/">http://neb.rf/</a>	Access from computers libraries
6.	<b>Single window of access to information resources.-</b> URL: <a href="http://window.edu.ru/">http://window.edu.ru/</a>	Openaccess s
7.	<b>Russian education. Federal educational portal. -</b> URL: <a href="http://www.edu.ru/index.php">http://www.edu.ru/index.php</a>	Openaccess s
8.	<b>World Health Organization.</b> - URL: <a href="http://who.int/en/">http://who.int/en/</a>	Openaccess s

**Other** Open resources can be found at: <http://rostgmu.ru> → Library  
→ Electronic catalog → Open Internet resources → further by keyword...

#### **6.4. Guidelines for students on mastering the discipline**

Mastering the discipline includes:

1. Analysis of theoretical questions on a given topic using the specified literature.
2. Writing a laboratory report using the teaching materials of the department indicated in the list of additional literature.
3. Performing the experimental part of laboratory work on a computer, presenting the obtained data in the form of tables and graphs, statistical processing of data.
4. Conclusions on the work, sending materials by e-mail to the teacher, checking the work with the teacher.

### **VII. MATERIAL AND TECHNICAL ENSURING DISCIPLINE**

#### **7.1. Educational and laboratory equipment.**

Personal computers, Windows 7 operating system, MsOffice application programs, Karelian Medical Information System, LotusNotesDomino database management system.

#### **7.2. Technical and electronic means.**

A course of lectures on the academic discipline “Medical Informatics” is presented in the form of presentations and displayed on the learning platform Rost State Medical University Distance Learning System <http://dotest.rostgmu.ru/>. In this case, sets of slides are used,

tables, multimedia visual materials on various sections of the discipline. Practical tasks are completed using personal computers.

Assessment of students' knowledge is carried out interactively using computer testing in the students' personal account in the distance learning system of Rostov State Medical University <http://dotest.rostgmu.ru/>.

### **Current monitoring of academic performance and intermediate certification of students at the Department of Medical and Biological Physics in the discipline "Medical Informatics"**

1. Current control of students' knowledge is carried out at each laboratory, practical and practical lesson on a five-point scale.

Criteria for assessing current performance.

"5" – the theoretical content of the discipline has been fully mastered, without gaps, the necessary practical skills have been formed, all educational tasks provided for in the work program have been completed at a high level, the report has been correctly prepared and conclusions on laboratory work have been drawn.

"4" – the theoretical content of the discipline has been fully mastered, without gaps, the necessary practical skills have been sufficiently developed, all the provided training tasks have been completed. The student may make minor mistakes, which can be easily corrected with the help of the teacher.

"3" – the theoretical content of the discipline has been mostly mastered, some practical skills have not been developed, some educational tasks provided for in the work program of the discipline have not been completed, or the quality of their implementation is quite low. Makes mistakes, which he corrects with the help of the teacher, but correcting mistakes causes difficulties.

"2" – the theoretical content of the discipline has not been mastered or partially mastered, the necessary practical skills have not been developed, most of the educational tasks have not been completed, or the quality of their implementation is assessed with a number of points close to the minimum. Makes serious mistakes that he cannot correct even with the help of a teacher.

"0" – the student is absent from class or does not participate in a control milestone enhanced event (computer testing).

2. Control activities are: 1. assessment during the current certification of students in each lesson (the criteria are set out above) and 2. a milestone enhanced control event in the form of computer testing of students (1 point for each test) and the implementation of individual tasks in the form of solving a situational problem (situational task – 3 points). The recalculation of points obtained during computer testing and solving a situational problem into a five-point scale is carried out according to the following criteria: "0" - did not participate in testing, "2" - 0-59%, "3" - 60-69%, "4" - 70-84%, "5" - 85-100% of the maximum number of points. If the result is unsatisfactory at the milestone reinforced control event, the student is given a second attempt to pass.

3. The average monthly rating ( $R_{month}$ ) is calculated as the arithmetic mean of the grades received in each lesson of the month.

4. The average semester rating ( $R_{cem}$ ) is formed on a five-point scale as the average of the average monthly ratings.

5. The student has the right and can work out a grade of "0", "2" for current classes to correct an unsatisfactory average monthly rating according to the teacher's weekly work schedule. The critical level of the average monthly rating is 3.0. An average monthly rating below 3.0 is unsatisfactory.



6. Grades of “0” and “2” for milestone enhanced control activities (testing and solving situational problems) are mandatory to be worked out according to the teacher’s work schedule.

7. In the absence of effectiveness in working out a milestone enhanced control event (the assessment on the second attempt does not reach satisfactory), as well as an unsatisfactory assessment of the average monthly ratings, the student works out over the next months until the end of the semester by orally answering questions developed by the department and informed in advance according to the weekly work schedule of teachers.

8. Interim certification with the result “pass” or “fail” is carried out by teachers of the department upon completion of the discipline in accordance with the individual work plans of teachers. The “passed” criterion is exceeding the average semester rating of the level “3.0” inclusive. In the discipline “Physics, Mathematics”, an additional criterion for “passed” is the average monthly rating for the first month of study (in the Mathematics block) of 3.0 points or more.

9. Information about students' performance (average monthly and average semester ratings) and attendance at classes and lectures (in hours) in disciplines is brought to the attention of students and provided monthly by the department to the dean's office until the 5th of the next month.