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

THERAPEUTIC ANG PROPHYLACTIC
Department

CONFIRM
Supervisor educational program
_____ / E.S. Belousova /
(signature) *(FULL NAME.)*
"28" августа 2020_

DISCIPLINE WORKING PROGRAM
Physics, mathematics

Speciality 31.05.01 General medicine

Form of education full-time

Rostov-on-Don
2020

I. GOALS AND OBJECTIVES OF MASTERING THE DISCIPLINE

Targetmastering an academic discipline"**Physics mathematics**» consists of mastering knowledge about the physical properties and physical processes occurring in nature, including biological objects and the human body, necessary both for teaching other academic disciplines and for the direct formation of the professional qualities of doctors.

Wherein***tasks***disciplines are:

– teaching students the most important methods of biophysics, allowing study physical phenomena in biological systems, the physical properties of these systems, the physicochemical foundations of life processes;

– development of methodological orientation among students, essential for solving problems of evidence-based medicine;

– formation in students of logical thinking, the ability to accurately formulate a task, the ability to isolate the main and secondary, the ability to draw conclusions based on the obtained measurement results;

– education of a sufficiently high mathematical culture; grafting skills of modern types of mathematical thinking; instilling the skills use of mathematical methods in practical activities;

– teaching students methods of mathematical statistics, used in medicine and allowing to extract the necessary information from the results of observations and measurements, to assess the degree of reliability of the data obtained;

– developing skills in studying scientific literature;

– training students in safety precautions when working with medical equipment.

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*abstract ability thinking, analysis, synthesis.

b) ***general professional (OPK): OPK-7*** readiness To the use of basic physical, chemical, mathematical and other natural science concepts and methods in solving professional

tasks

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

3.1. Academic discipline"Physics mathematics" refers to basic part of the specialty program and is mandatory for students to master.

3.2. The discipline “Physics, Mathematics” creates the prerequisites formation of these competencies in the disciplines: Philosophy, Psychology and Pedagogy, Medical Informatics, Chemistry, Biochemistry, Biology, Phthisiology, Dentistry, Law, Forensic Medicine, Scientific work, Topographic anatomy and operative surgery, Histology, embryology, cytology, Normal physiology, Fundamental medicine.

IV. CONTENT AND STRUCTURE OF DISCIPLINE Labor intensity of the discipline in 3___3__ hour _108_____

4.1. Sections of the discipline studied in the __1_ semester

No. section	Name section	Number of hours					
		Always O	Contact Job				SRO*
			L	WITH	ETC	L R	
Semester 1							
1	Basic theory probabilities and mathematical statistics.	29	4		12		13
2	Mechanical fluctuations and waves. Biorheology. Bioelectrogenesis.	50	6		3	12	29
3	Optics. Absorption Sveta. Ionizing radiation.	29	4		3	12	10
	Form intermediate certification		TEST				
	Total:	**108**	**14**		**18**	**24**	**52**

SRO- independent work of students;**L**– lectures;**LR –** laboratory works;**ETC**- practical lessons

4.2. Contact work

Lectures

No. section	No. lectures And	Lecture topics	Qty hours
Semester 1			
1	1	Leading to discipline. Fundamentals of probability theory.	2
1	2	Fundamentals of mathematical statistics.	2
2	3	Mechanical vibrations and waves. Acoustics.	2
2	4	Elements of biorheology, hemodynamics. Biological membranes.	2
2	5	Bioelectrogenesis. Electrical properties of biological tissues.	2
3	6	Optics. Absorption of light.	2
3	7	Ionizing radiation. Elements	2
TOTAL HOURS			14

Laboratory works

No. section	No. LR	Laboratory topics	Number in hours	Shapes of the current control
Semester 1				
2	5	Mechanical waves. Acoustics.	3	Checking educational materials through email
2	6	Hemodynamics.	3	Checking educational materials through email
2	7	Study of frog skin permeability	3	Checking educational materials through email

2	8	Biophysical basis electrography.	3	Checking educational materials through email
2	10	Electrical properties of body tissues.	3	Checking educational materials through email
3	eleven	Optical microscopy.	3	Checking educational materials through email
3	12	Absorption of light.	3	Checking educational materials through email
3	13	Dosimetry of ionizing radiation.	3	Checking educational materials through email
TOTAL HOURS			24	

Practical work

No. section	No. ETC	Topics of practical work	Number in hour V	Shapes of the current control
Semester1				
1	1	Elements of probability theory.	3	Checking educational materials through email
1	2	Statistical analysis.	3	Checking educational materials through email
1	3	Testing statistical hypotheses.	3	Checking educational materials through email
1	4	Colloquium I "AboutProbability theory and mathematical statistics again."	3	Testing for platform http:// dotest.rostgmu.ru/.
2	9	Colloquium II "Mechanical vibrations and waves. Biorheology.	3	Testing for platform http://

No. section	No. ETC	Topics of practical work	Number in hour V	Shapes of the current control
3	14	Colloquium III. "Optics. Absorption Sveta. Ionizing radiation."	3	Testing for platform http:// dotest.rostgmu.ru/.
Total by semester hours			18	

4.3. Independent work of students

No. chapter A	Type of independent work students	Number in hour V	Shapes of the current control
Semester 1			
1	Studying theory, preparing for current classes, preparing for a test lesson	12	Checking educational materials through electronic mail
2	Studying theory, preparing for current classes, preparing for a test lesson	28	Checking educational materials through electronic mail
3	Studying theory, preparing for current classes, preparing for a test lesson	12	Checking educational materials through electronic mail
TOTAL HOURS		52	

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 SECURITY DISCIPLINES

Remizov A. N. Medical and biological physics: textbook: [rec. Ministry of Defense of the Russian Federation: for medical students and teachers. universities] / A.N. Remizov. - 4th ed.,

corr. and additional –M.: GEOTAR-Media, 2018. - 647 p. Access from EBS "Student Consultant"http://www.studmedlib.ru/ .

	ELECTRONIC EDUCATIONAL RESOURCES	Access to the resource
1.	**Electronic library RostSMU**. – URL: http://109.195.230.156:9080/opacg/	Access is not limited
2.	**Student Advisor**: EBS. – Moscow: LLC "IPUZ". -URL:http:// www.studmedlib.ru	Access is not limited
3.	**Doctor's consultant.**Electronic medical library: EBS. – Moscow: LLC GC "GEOTAR". - URL:http://www.rosmedlib.ru	Access is not limited
4.	**Scientific electronic library eLIBRARY**. - URL:http://elibrary.ru	Open access
5.	**Scopus**/Elsevier Inc., Reed Elsevier. – Philadelphia: Elsevier BV, PA. – URL:http://www.scopus.com/*(National project)*	Access is not limited
6.	**Web of Science**/Clarivate Analytics. - URL:http://apps.webofknowledge.com *(National project)*	Access is not limited
7.	**Single window of access to information resources**. - URL: http://window.edu.ru/	Open access
8.	**Russian education. Federal educational portal**. - URL:http://www.edu.ru/index.php	Open access
9.	**Federal Electronic Medical Library of the Ministry of Health Russia**. - URL:http://www.femb.ru/feml/,http://feml.scsml.rssi.ru	Open access
10.	**CyberLeninka**: scientific electron. beep. -URL:http://cyberleninka.ru/	Open access
eleven.	Archive of scientific journals / NEIKON. - URL:https://archive .neicon .ru/xmlui/	Open access
12.	**Med-Edu.ru**: medical video portal. - URL: edu.ru/ http://www.med-	Open access

Guidelines for students on mastering the discipline.

Lectures, files With examples, educational video, files Individual assignments are presented for each lesson on the distance learning platform of RostSMU http://dotest.rostgmu.ru/.

Laboratory and practical work includes:

1.Studying theoretical issues on a given topic using materials posted on the distance learning platform and recommended literature.

2. Writing a laboratory report according to the methodological recommendations in the attached files.

3. Choose fromfile with individual tasks of your version and its implementation: solving situational problems, performing calculations, presentation of the obtained results in the form of graphs, statistical data processing, calculation of calculation errors.

4. Completing the work and sending a photo of the report to the teacher by email.

Midterm control on topics is carried out in the form of computer testing on the distance learning platform of RostGMU http:// dotest.rostgmu.ru/.

VII. LOGISTICS DISCIPLINES

7.1. Educational and laboratory equipment.

Personal computers, MsOffice application programs.

7.2. Technical and electronic means.

A course of lectures on the academic discipline “Physics, Mathematics” is presented in the form of presentations and posted on the distance learning platform of RostSMU http://dotest.rostgmu.ru/. In this case, sets of slides, tables, and multimedia visual materials are used in various sections of the discipline. Lectures are given in the Google meet service.

Assessment of students' knowledge is carried out interactively using computer testing in the students' personal account in the distance learning system of RostSMU http://dotest.rostgmu.ru/.

Current monitoring of academic performance and intermediate certification of students at the Department of Medical and Biological Physics discipline "Physics, mathematics"

1. Current control of students’ knowledge is carried out at each laboratory-practical and practical classes 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 assigned 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 largely 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 is not mastered or mastered partially, 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 control milestone enhanced event (computer testing).

2. Control measures are: 1. assessment when
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 completion 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. Average monthly rating (Rmonth) is calculated as the average arithmetic from the grades received in each lesson of the month.

4. The average semester rating (Rcem) is formed on a five-point scale scale as the average of monthly average 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) must 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 giving an oral response to the department-developed and
questions informed in advance according to the teachers’ weekly training schedule.

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 day of the next month.