

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

Faculty of Education of foreign students, residents and postgraduates



CONFIRM

Supervisor  
educational program

/ ES Belousova /  
(FULL NAME.)

(signature)

" 30" *августа* 20\_23

DISCIPLINE WORK PROGRAM

PHYSICAL BASICS OF DIAGNOSIS AND THERAPY

Speciality 05/31/01 General medicine

Form of study -full-time

Rostov-on-Don  
2023

## I. GOALS AND OBJECTIVES OF MASTERING THE DISCIPLINE

**1.1 Purpose** mastering the discipline: to form students' knowledge about physical processes occurring in biological objects and the human body; study the basics of diagnostic and therapeutic methods used in medicine.

1.2. Objectives of studying the discipline:

- 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;
- developing skills in studying scientific literature;

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

The study of the discipline is aimed at developing competence in accordance with the Federal State Educational Standard of Higher Education and the EP of Higher Education in this specialty:

General professional: OPK-4

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

**3.1.** Academic discipline "PHYSICAL FOUNDATIONS OF DIAGNOSTICS AND THERAPIES" refers to the basic part of the RUP in the specialty 05/31/01 General 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 5\_ semester**

No. section	Name section	Number of hours					SRO*
		Total	Contact Job				
			L	WITH	ETC	LR	
Semester 6							
1	Physical Basics diagnostic methods	34	6		20		8

2	Physical Basics physiotherapeutic methods	19	2		6		eleven
3	Ionizing radiation. High medical technologies.	19	4		6		9
	Intermediate form certification	36	EXAM				
	<b>Total:</b>	<b>108</b>	<b>12</b>		<b>32</b>		<b>28</b>

**SRO**- independent work of students;**L**- lectures;**ETC**- practical lessons

## 4.2. Contact work

### Lectures

No. section	No. lectures	Lecture topics	Qty hours
Semester 5			
1	1	Medical equipment.	2
1	2	Physical foundations of electrophysical diagnostic methods.	2
1	3	Physical basis for measuring the mechanical characteristics of the body. Ultrasound diagnostic therapeutic methods.	And 2
2	4	Physical foundations of physiotherapeutic methods.	2
3	5	Ionizing radiation in medicine.	2
3	6	High medical technologies. Artificial intelligence in medicine and healthcare.	2
TOTAL HOURS			12

### Practical work

No. section	No. ETC	Topics of practical work	Number in hours	Forms of current control
Semester 5				
1	1	Audiometry. Sound research methods in the clinic	2	Survey, defense of practical work

No. section	No. ETC	Topics of practical work	Number in hours	Forms of current control
1	2	Devices for collecting, transferring and recording medical biological information	2	Survey, defense of practical work
1	3	Physical Basics electrography	2	Survey, defense of practical work
1	4	Rheography	2	Survey, defense of practical work
1	5	<b>Frontier control 1. Sensors Electrographic diagnostic instruments</b>	2	Testing
1	6	Spirometry	2	Survey, defense of practical work
1	7	Ultrasound diagnostics	2	Survey, defense of practical work
1	8	Blood pressure measurement	2	Survey, defense of practical work
1	9	General diagram of diagnostic devices	2	Oral survey, report
1	10	<b>Frontier control 2. Diagnostic equipment</b>	2	Testing
2	eleven	Low frequency therapy	2	Survey, defense of practical work
2	12	High frequency therapy devices	2	Survey, defense of practical work
3	13	High medical technologies. Artificial intelligence in medicine and healthcare.	2	Oral survey, report
3	14	Dosimetry of ionizing radiation	2	Survey, defense of practical work
3	15	Action of ionizing radiation on the human body	2	Oral survey, report
2.3	16	<b>Frontier control 3. Therapeutic medical equipment. Basics of dosimetry.</b>	2	Testing

No. section	No. ETC	Topics of practical work	Number in hours	Forms of current control
Total hours per semester			32	

### 4.3. Independent work of students

No. section	Type of independent work students	Number in hours	Shapes of the current control
Semester 5			
1	Studying theory, preparing for current classes, preparing for a test lesson	8	Survey, testing
2	Studying theory, preparing for current classes, preparing for a test lesson	eleven	Survey, testing
3	Studying theory, preparing for current classes, preparing for a test lesson	9	Survey, testing
TOTAL HOURS		28	

## 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. DISCIPLINES

EDUCATIONAL AND METHODOLOGICAL

SECURITY

### 6.1. Main literature

1. 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., rev. and additional –M.: GEOTAR-Media, 2016. - 647 p.

2. Remizov A.N. Textbook on medical and biological physics: for students of medical universities / A.N. Remizov, A.G. Maksina, A.Ya. Potapenko. - ed. 8th, erased. - M.: Bustard, 2008. - 558 p.

## 6.2. Internet resources

ELECTRONIC EDUCATIONAL RESOURCES	Access to the resource
<b>Electronic library RostSMU.</b> – URL: <a href="http://109.195.230.156:9080/opacq/">http://109.195.230.156:9080/opacq/</a>	Access is not limited
<b>Student Advisor</b> [Kits: "Medicine. Healthcare. IN"; "Medicine. Healthcare. SPO"; "Psychological Sciences"]: Electronic library system. – Moscow: Politekhresurs LLC. - URL: <a href="https://www.studentlibrary.ru">https://www.studentlibrary.ru</a> + opportunities for inclusive education	Access is not limited
<b>Doctor's consultant. Electronic medical library:</b> Electronic library system. – Moscow: LLC "Higher School of Organization and Management of Healthcare. Comprehensive medical consulting." - URL: <a href="http://www.rosmedlib.ru">http://www.rosmedlib.ru</a> + opportunities for inclusive education	Access is not limited
<b>Scientific electronic library eLIBRARY.</b> - URL: <a href="http://elibrary.ru">http://elibrary.ru</a>	Open access
<b>National Electronic Library.</b> - URL: <a href="http://neb.rf/">http://neb.rf/</a>	Access from computers libraries
<b>Springer Nature database.</b> - URL: <a href="https://link.springer.com/">https://link.springer.com/</a> via IP addresses of RostSMU and remotely after registration, remotely via KIAS RFBRR <a href="https://kias.rfbr.ru/reg/index.php">https://kias.rfbr.ru/reg/index.php</a> (National project)	Access is not limited
<b>Wiley Online Library</b> /John Wiley & Sons. - URL: <a href="http://onlinelibrary.wiley.com">http://onlinelibrary.wiley.com</a> via IP addresses of RostSMU and remotely after registration(National project)	Access limited
<b>Wiley. Full-text collection of electronic journals Medical Sciences Journal Backfile:</b> archive. –URL: <a href="https://onlinelibrary.wiley.com/">https://onlinelibrary.wiley.com/</a> via IP addresses of RostSMU and remotely after registration(National project)	Indefinite subscription
<b>Sage Publication:</b> [full text collection of e-books eBook Collections]. – URL: <a href="https://sk.sagepub.com/books/discipline">https://sk.sagepub.com/books/discipline</a> via IP RostSMU addresses(National project)	Indefinite subscription
<b>PubMed:</b> electronic search engine [for biomedical research from the National Center for Biotechnology Information (NCBI, USA)]. - URL: <a href="https://pubmed.ncbi.nlm.nih.gov/">https://pubmed.ncbi.nlm.nih.gov/</a>	Open access
<b>Other</b> Open resources can be found at: <a href="http://rostgmu.ru">http://rostgmu.ru</a> → Library → Electronic catalog → Open resources Internet → further by keyword...	

## 6.3. Guidelines for students on mastering disciplines

## **-Planning and organizing the time needed to study disciplines**

An important condition for successful mastery of the discipline “Physics and Mathematics” is the creation of a system of proper organization of work that allows you to distribute the educational load evenly in accordance with the schedule of the educational process. Drawing up a work plan can be of great help in this. Its presence will allow you to subordinate your free time to study purposes and work more successfully and efficiently. In the evening you should always distribute work for tomorrow. At the end of each day, it is advisable to summarize the work: carefully check whether everything was completed according to the plan, whether there were any deviations, and if there were, for what reason they occurred. It is necessary to exercise self-control, which is a necessary condition for successful study. If something is left undone, time must be found to complete that part of the work. It is recommended to complete all tasks for practical classes, as well as tasks assigned for independent work, immediately after the corresponding topic of the lecture course, which contributes to better assimilation of the material, allows you to promptly identify and eliminate “gaps” in knowledge, systematize previously covered material, and proceed on its basis to mastering new knowledge and skills.

### **-Preparation for lectures**

Acquaintance with the discipline occurs already at the first lecture, where the student is required not only to pay attention, but also to independently prepare notes. When working with lecture notes, it is necessary to take into account the fact that some lectures provide answers to specific questions on the topic, while others only reveal the relationships between phenomena, helping the student understand the deep processes of development of the subject being studied, both in history and at the present time. Lecture note-taking is a complex type of university classroom work that involves intense mental activity of the student. A note is useful when the most essential things are written down and done by the student himself. There is no need to try to write down the entire lecture verbatim. This kind of “note-taking” does more harm than good. It is advisable to first understand the main idea presented by the lecturer and then write it down. It is advisable to record on one page of the sheet or leave fields on which later, when working independently with notes, you can make additional notes and mark unclear places.

It is better to divide the lecture notes into points, observing the red line. This will be greatly facilitated by the lecture plan questions proposed to the teachers. You should pay attention to the emphasis and conclusions that the lecturer makes, marking the most important points in the lecture material with the remarks “important”, “well remember”, etc. You can do this with the help of multi-colored markers or pens,

emphasizing terms and definitions.

It is advisable to develop your own system of abbreviations, abbreviations and symbols. However, when further working with notes, it is better to replace the symbols with ordinary words for quick visual perception of the text. When working on lecture notes, it is always necessary to use not only the textbook, but also the literature that the lecturer additionally recommended. It is this kind of serious, painstaking work with the lecture material that will allow you to deeply master the theoretical material.

### **-Preparation for practical classes**

The student must begin preparing for each practical lesson by familiarizing himself with the practical lesson plan, which reflects the content of the proposed topic. Careful thinking through and study of the plan's issues is based on studying the current lecture material, and then studying the required and additional literature recommended for this topic. All new concepts on the topic being studied must be memorized and included in a glossary, which should be kept from the very beginning of the course. The result of such work should be manifested in the student's ability to freely answer theoretical questions of the workshop, his speech and participation in a collective discussion of issues on the topic being studied, the correct completion of practical assignments and tests.

In the process of preparing for practical classes, students need to pay special attention to independent study of the recommended literature. Despite the completeness of the lecture notes, it is impossible to present all the material in it due to the limit of classroom hours. Therefore, independent work with textbooks, teaching aids, scientific and reference literature, materials from periodicals and the Internet is the most effective method of acquiring additional knowledge, allows you to significantly intensify the process of mastering information, promotes a deeper assimilation of the material being studied, and shapes students' attitude to a specific problem.

### **-Recommendations for working with literature**

It is advisable to start working with literature by studying general works on the topic, as well as textbooks and teaching aids. Next, it is recommended to move on to the analysis of monographs and articles that consider individual aspects of the problems studied in the course, as well as official materials and unpublished documents (research papers, dissertations), which may contain the main issues of the problem being studied.

Work with sources should begin with introductory reading, i.e. view the text, highlighting its structural units. During introductory reading, bookmarks mark those pages that require more careful study.

Depending on the results of the introductory reading, a further method of working with the source is chosen. If for permission



If the task at hand requires the study of some fragments of the text, then the selective reading method is used. If the book does not have a detailed table of contents, the student should pay attention to the subject and name indexes.

Selected fragments or the entire text (if it is entirely related to the topic) require thoughtful, leisurely reading with "mental elaboration" of the material. Such reading involves highlighting: 1) the main thing in the text; 2) main arguments; 3) conclusions. Particular attention should be paid to whether the thesis follows from the arguments or not.

It is also necessary to analyze which of the author's statements are problematic, hypothetical in nature and to grasp hidden issues. It is clear that the ability to work with text in this way does not come immediately. The best way to learn to highlight the main points in a text, to grasp the problematic nature of statements, and to evaluate the author's position is comparative reading, during which the student gets acquainted with different opinions on the same issue, compares the weight and evidence of the arguments of the parties and draws a conclusion about the greatest persuasiveness of that one. or other position.

If in the literature there are different points of view on a particular issue due to the complexity of past events and legal phenomena, they cannot be rejected without understanding them. If there are discrepancies between the authors, it is necessary to find a rational grain in each of them, which will allow a deeper understanding of the subject of study and a more critical assessment of the issues being studied. Getting acquainted with the special positions of the authors, you need to identify their similar judgments, arguments, conclusions, and then compare them with each other and apply the one that is more convincing.

The next stage of working with literary sources is the creation of notes that capture the main theses and arguments. You can make notes on separate sheets of paper, which can then be easily organized into individual topics of the course being studied. Another way is to keep thematic notebooks on one topic. It is advisable to take notes on large specialized works of a monographic nature in separate notebooks. It is important to remember here that notes are written on one side of the sheet, with margins and sufficient line spacing for corrections and remarks (these rules are observed for ease of editing). If quotations are given in the notes, then an indication of the source (author, title, imprint, page number) must certainly be given. Subsequently, this information can be used when writing the text of an essay or other assignment.

Thus, when working with sources and literature, it is important to be able to:

- compare, compare, classify, group, systematize information in accordance with a specific educational task;

- summarize the information received, evaluate what you listened to and

read;

- record the main content of messages; formulate, orally and in writing, the main idea of the message; draw up a plan, formulate theses;

- prepare and present detailed reports such as a report;
- work in different modes (individually, in pairs, in groups), interacting with each other;
- use abstracts and reference materials;
- control your actions and the actions of your comrades, objectively evaluate your actions;
- seek help and additional clarification from the teacher or other students.

- use linguistic or contextual guesses, dictionaries of various kinds, various kinds of hints, supports in the text (keywords, text structure, preliminary information, etc.);

- use periphrases, synonymous means, words that describe general concepts, explanations, examples, interpretations, "word creation" when speaking and writing;

- repeat or paraphrase the interlocutor's remarks to confirm understanding of his statement or question;

- seek help from your interlocutor (clarify the question, ask again, etc.);

- use facial expressions and gestures (in general and in cases where linguistic means are not enough to express certain communicative intentions).

#### **-Preparation for intermediate certification**

When preparing for intermediate certification, it is advisable to:

- carefully study the list of questions and determine which sources contain the information necessary to answer them;
- carefully read the recommended literature;
- make short notes of answers (answer plans).

