

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

(Signature) / E.S. Belousova /
(FULL NAME.)

" 30 " *август* 2023

DISCIPLINE WORKING PROGRAM

MEDICAL INFORMATICS

Speciality 31.05.01 General medicine

Form of education full-time

I. GOALS AND OBJECTIVES OF MASTERING THE DISCIPLINE

1.1 Purpose mastering the discipline: 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.

1.2. Objectives of studying the discipline:

- give students information about modern computer technologies used in medicine and healthcare;
- to form students' knowledge about methods of informatization of medical activities, automation of clinical trials, computerization of management in the healthcare system;
- train students to use standard and special software provision for solving medical and healthcare problems, computer mathematics systems, means of information support for medical decisions, automated medical and technological systems.
- train students in the ability to organize and implement practical medical practice 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:

b) general professional (OPK): OPK-10

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

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

IV. CONTENT AND STRUCTURE OF THE DISCIPLINE Labor
intensity of the discipline in 3__4__ hour _144_____
Sections of the discipline studied in _6, C_ semesters

| No. section | Section name | Number of hours | | | | | |
|--|---|-----------------|-------------|---------|----|-----|----|
| | | Total | Contact Job | | | SRO | |
| | | | L | WITHETC | LR | | |
| Semester 6 | | | | | | | |
| 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 | | 2 | | 2 | | 2 |
| 2 | Basic technologies information transformation | | 4 | | 14 | | 16 |
| 3 | Modeling of physiological, morphological, molecular genetic and biochemical processes | | 2 | | 6 | | 4 |
| 4 | Automated medical and technological systems for clinical, laboratory, scientific research and functional diagnostics. | | 2 | | 5 | | 2 |
| 5 | Information Systems medical institutions | | 1 | | 4 | | 2 |
| 6 | Information support for the diagnostic and treatment process. Telecommunication technologies and Internet resources in medicine. Telemedicine | | 1 | | 1 | | 2 |
| Total for the semester | | 72 | 12 | | 32 | | 28 |
| Interim certification form (test/ test with assessment/exam) | | TEST | | | | | |
| Semester C | | | | | | | |
| 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 | | 2 | | 1 | | 2 |
| 5 | Information Systems medical institutions | | 2 | | 23 | | 20 |

| | | | | | | | |
|--|---|-----------------|----|--|----|--|----|
| 6 | Information support for the diagnostic and treatment process. Telecommunication technologies and Internet resources in medicine. Telemedicine | | 6 | | 8 | | 6 |
| 7 | Methods for statistical processing of medical results biological research | | 2 | | | | |
| Total for the semester | | 72 | 12 | | 32 | | 28 |
| Interim certification form (test/ test with assessment/exam) | | TEST WITH GRADE | | | | | |
| <i>Total for the discipline:</i> | | 144 | 24 | | 64 | | 56 |

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

4.2. Contact work

Lectures

| No. section | No. lectures | Lecture topics | Qty hours |
|--------------------------|--------------|---|-----------|
| Semester 6 | | | |
| 1 | 1 | Introduction to general and medical informatics | 2 |
| 2 | 2 | Software for information processes. | 2 |
| 3 | 3 | Expert systems in medicine. Modeling in medicine. | 2 |
| 2 | 4 | Computer hardware | 2 |
| 4 | 5 | Medical instrumentation and computer systems | 2 |
| 5.6 | 6 | Medical information systems. Medical resources Internet. Concept of telemedicine. | 2 |
| Total hours per semester | | | 12 |
| Semester C | | | |
| 1 | 1 | Information technologies and their application in medicine and healthcare | 2 |
| 6 | 2 | Informatization of the medical technological process in a medical institution. | 2 |

| | | | |
|--------------------------------|---|--|----|
| 6 | 3 | Unified state information system in the field of healthcare. Telecommunication technologies in medicine and healthcare | 2 |
| 5 | 4 | Functional characteristics of the modules of the BARS medical information system | 2 |
| 6 | 5 | Possibilities of a mobile service for doctors and patients within the BARS medical information system | 2 |
| 7 | 6 | Review of modern programs for automated statistical analysis of biomedical data | 2 |
| Total hours per semester | | | 12 |
| <i>Total hours discipline:</i> | | | 24 |

Practical lessons

| No. section | No. PZ | Topics of practical work | Number in hours | Forms of current control |
|-------------|--------|--|-----------------|---|
| Semester 6 | | | | |
| 2 | 1 | Introductory lesson. Functionality of modern operating systems. | 2 | Oral questioning, verification practical skills |
| 2 | 2 | Information technologies for creating text documents using Microsoft Office Word | 2 | Oral questioning, verification practical skills |
| 2 | 3 | Information technologies for preparing presentations using Microsoft Office Power Point | 2 | Oral questioning, verification practical skills |
| 2 | 4 | Frontier control 1. | 2 | Testing |
| 1 | 5 | Basics of general computer science | 2 | Oral survey |
| 2 | 6 | Information technologies for creating spreadsheets and methods for managing them with using Microsoft Office Excel | 2 | Oral questioning, verification practical skills |
| 2 | 7 | Microsoft Access database management system | 2 | Oral questioning, verification practical skills |
| 2 | 8 | Frontier control 2. | 2 | Testing |

| No. section | No. PZ | Topics of practical work | Number in hours | Forms of current control |
|-------------------------|--------|---|-----------------|---|
| 4 | 9 | Medical instrumentation computer systems. Automation of functional research in medicine. | 2 | Oral questioning, verification practical skills |
| 3 | 10 | Intelligent systems in medicine. General issues of medical modeling biological processes. Expert systems. | 2 | Oral survey |
| 3 | eleven | Modeling hemodynamics in an elastic vessel (Frank model) | 2 | Oral questioning, verification practical skills |
| 3 | 12 | Working with expert systems | 2 | Oral questioning, verification practical skills |
| 5 | 13 | Medical information systems: concept, classification, functions. | 2 | Oral survey |
| 5.6 | 14 | Introduction to the medical information system. The concept of the Unified State Information System healthcare. | 2 | Oral questioning, verification practical skills |
| 4 | 15 | Automated assessment of medical quality functional and laboratory tests | 2 | Oral questioning, verification practical skills |
| 4.5 | 16 | Frontier control 3. | 2 | Testing. Summing up results. |
| Total by semester hours | | | 32 | |
| Semester C | | | | |
| 1.5 | 1 | Information technologies and their application in medicine and healthcare. Medical informational systems clinics | 2 | Oral survey |
| 5 | 2 | Work in the MIS modules "Registration in a medical organization", "Digital medical patient profile", "Outpatient medical appointment" | 2 | Oral questioning, verification practical skills |

| No. section | No. PZ | Topics of practical work | Number in hours | Forms of current control |
|--------------------------------|---------------|--|------------------------|---|
| 5.6 | 3 | Information interaction with the subsystem "Federal Integrated Electronic Medical Record" Uniform State Health Information System (IEMK)". | 2 | Oral questioning, verification practical skills |
| 5 | 4 | Working with MIS modules "Prescription writing", "Electronic leaflet disability" | 2 | Oral questioning, verification practical skills |
| 5.6 | 5 | Working with modules "Medical examinations patients", "Dispensary records". | 2 | Oral questioning, verification practical skills |
| 5 | 6 | Frontier control 1. | 2 | Testing |
| 5 | 7 | Hospital medical information systems | 2 | Oral survey |
| 5 | 8 | Job Withmodule MIS "Emergency room" | 2 | Oral questioning, verification practical skills |
| 6 | 9 | Job Withmodule MIS "Residency", "Pharmacy" | 2 | Oral questioning, verification practical skills |
| 6 | 10 | Working with the MIS "Telemedicine" module | 2 | Oral questioning, verification practical skills |
| 5 | eleven | Working with the MIS "Diagnostics" module | 2 | Oral questioning, verification practical skills |
| 5 | 12 | Frontier control 2 | 2 | Testing |
| 6 | 13 | Information technologies organizational and managerial medical informatics | 2 | Oral survey |
| 5 | 14 | Working with the MIS module "Nosology Registers" | 2 | Oral questioning, verification practical skills |
| 5 | 15 | Working with the MIS module "Emergency Medical Care" | 2 | Oral questioning, verification practical skills |
| 5 | 16 | Frontier control 3 | 2 | Testing. Summing up results |
| Total by semester hours | | | 32 | |
| <i>Total hours discipline:</i> | | | 64 | |

4.3. Independent work of students

| No. section | Type of independent work of students | Number in hours | Shapes of the current control |
|--------------------------------|---|-----------------|-------------------------------|
| Semester 6 | | | |
| 1 | Studying theory, preparing for current classes, preparing for a test lesson | 2 | Survey, testing |
| 2 | Studying theory, preparing for current classes, preparing for a test lesson | 16 | Survey, testing |
| 3 | Studying theory, preparing for current classes, preparing for a test lesson | 4 | Survey, testing |
| 4 | Studying theory, preparing for current classes, preparing for a test lesson | 2 | Survey, testing |
| 5 | Studying theory, preparing for current classes, preparing for a test lesson | 2 | Survey, testing |
| 6 | Studying theory, preparing for current classes, preparing for a test lesson | 2 | Survey, testing |
| Total hours per semester | | 28 | |
| Semester C | | | |
| 1 | Studying theory, preparing for current classes, preparing for a test lesson | 2 | Survey, testing |
| 5 | Studying theory, preparing for current classes, preparing for a test lesson | 20 | Survey, testing |
| 6 | Studying theory, preparing for current classes, preparing for a test lesson | 6 | Survey, testing |
| Total hours per semester | | 28 | |
| <i>Total hours discipline:</i> | | 56 | |

V. ASSESSMENT MATERIALS FOR CURRENT CONTROL, INTERMEDIATE CERTIFICATION

Assessment materials for determining the level of development of competencies as a result of mastering the discipline are an appendix to the work program.

VI. EDUCATIONAL AND METHODOLOGICAL SUPPORT OF DISCIPLINE

6.1. Printed publications

1. Omelchenko, V. P. Medical informatics: textbook: Recommended by GBOU DPO "Ros. honey. acad. postgraduate Education / V. P. Omelchenko, A. A. Demidova. – Moscow: GEOTAR-Media, 2019. - 527 p. - Access from EBS "Student Consultant". –Text electronic.

2. Omelchenko, V. P. Medical informatics: textbook / V. P. Omelchenko, A. A. Demidova. – Moscow: GEOTAR-Media, 2016. - 528 p. - Access from EBS “Student Consultant”. –Electronic text.

3. Omelchenko, V. P. Informatics. Workshop / V. P. Omelchenko, A. A. Demidova. – Moscow: GEOTAR-Media, 2016. - 336 p. - Access from EBS “Student Consultant”. –Text electronic.

6.2. Internet resources

| | ELECTRONIC EDUCATIONAL RESOURCES | Access to the resource |
|--|--|---------------------------------|
| | Electronic library RostSMU. – URL: http://109.195.230.156:9080/opacg/ | Access is not limited |
| | Student Advisor [Kits: "Medicine. Healthcare. IN"; "Medicine. Healthcare. SPO"; "Psychological Sciences"]: Electronic library system. – Moscow: Politekhresurs LLC. - URL: https://www.studentlibrary.ru + opportunities for inclusive education | Access is not limited |
| | Scientific electronic library eLIBRARY. - URL: http://elibrary.ru | Open access |
| | National Electronic Library. - URL: http://neb.rf/ | Access from computers libraries |
| | Springer Nature database. - URL: https://link.springer.com/ via IP addresses of RostSMU and remotely after registration, remotely via RFBR CIAS https://kias.rfbr.ru/reg/index.php (National project) | Access is not limited |
| | Ministry of Health of the Russian Federation: official website. - URL: https://minzdrav.gov.ru | Open access |
| | Russian education. Single window of access: federal portal.- URL: http://www.edu.ru/ .– New educational environment. | Open access |
| | Dictionaries and encyclopedias on Academician. - URL: http://dic.academic.ru/ | Open access |
| | Cyberleninka Open Science Hub: open scientific electronic library of publications in foreign languages. – URL: https://cyberleninka.org/ | Content open that access |
| | Archive of scientific journals/ NP NEIKON. -URL: https://arch.neicon.ru/xmlui/ | Open access |

6.3. Guidelines for students on mastering the discipline

• **Planning and organizing the time needed to study disciplines**

An important condition for successfully mastering the discipline “Medical Informatics” 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 also do this using colorful 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 obtaining additional knowledge, it allows you to significantly intensify the process of mastering information, promotes a deeper assimilation of the material being studied, and forms in students their 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 solving the problem requires studying certain 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 with a friend;
- use abstracts and reference materials;
- control your actions and the actions of your comrades, objectively evaluate your actions;
- seek help or additional clarification from the teacher, other students.
- use linguistic or contextual guesses, dictionaries of a different nature, various kinds of hints, supports in the text (keywords, text structure, preliminary information, etc.);
- use periphrases, synonymous means, words when speaking and writing descriptions of general concepts, explanations, examples, interpretations, "word creation";
- repeat or paraphrase the interlocutor's remarks to confirm understanding his statements or questions;
- seek help from your interlocutor (clarify the question, ask again, etc.);
- use facial expressions, gestures (in general and in cases where there are no linguistic means 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 in which sources there is information necessary to answer them;
- carefully read the recommended literature;
- make short notes of answers (answer plans).