MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION
Federal state autonomous educational institution
of higher education
«Far Eastern Federal University»
(FEFU)

SCHOOL OF BIOMEDICINE

«AGREED»
Head of education program
«General medicine»
_____ Khotimchenko Yu.S._____
(signature) (Full name)
«09» of July 2019

«APPROVED»
Director of the Department of Clinical Medicine
_____ Geltser B.I._____
(signature) (Full name)
«09» of July 2019

WORKING PROGRAM OF ACADEMIC DISCIPLINE (WPAD)
«Medical informatics, mathematics»
Educational program
Specialty 31.05.01 «General medicine»
Form of study: full time

year 2 semester 4
lectures 18 hours
practical classes 18 hours
laboratory works 36hours
total amount of in-classroom work 72 hours
independent self-work 72 hours
including exam preparation 36 hours
control works ()
credit not provided
exam 2 year, 4 semester

The working program is drawn up in accordance with the requirements of the Federal state educational standard of higher education (level of training), approved by the order of the Ministry of education and science of the Russian Federation from 09.02.2016 № 95.

The working program of the discipline was discussed at the meeting of the Department of fundamental and clinical medicine. Protocol No. 8, 09 of July 2019

Author: Ostanin M.V.

ABSTRACT

The discipline "Medical informatics, mathematics" is intended for students enrolled in the educational program "General Medicine", it is included in the basic part of the curriculum.

Discipline is realized on the 2nd course, it is the basic discipline.

In developing the work program of the academic discipline, the Federal State Educational Standard of Higher Education, specialty 31.05.01 " General Medicine ", curriculum for training specialists in the profile of the medical case.

The total complexity of the discipline is 144 hours, 4 credit units.

The course program is based on the basic medical knowledge obtained by students:

- the ability and willingness to analyze the results of his own activity to prevent professional errors (CPC-5);

- the readiness to use basic physical and chemical, mathematical and other natural science concepts and methods in solving professional problems (CPC – 7);

- the willingness to participate in the evaluation of the quality of medical care using basic health statistics (PC – 18).

Purpose of the course: the formation of competencies in theoretical knowledge, skills and habits of collecting, processing and analyzing statistical data obtained at different stages of scientific research necessary for the subsequent professional activities of specialists.

Tasks:

• to form a knowledge system on the statistical processing of biomedical research data;

• show the possibility of using multidimensional statistical methods for processing information and analyzing experimental data;

• familiarize with the methods of systematization of experimental material in the interpretation of scientific facts;

• use specialized software designed for statistical data analysis.

To solve these problems, a course of thematic lectures, practical classes and laboratory work is planned.

As a result of studying this discipline, students develop the following general cultural, general professional competencies:

Code and formulation of competence.	**Stages of formation of competence**	
the ability to abstract thinking, analysis, synthesis (GCC-1)	**Know**	Fundamentals of abstract thinking, logical and reasoned analysis;
	Can	Conduct a logical and reasoned analysis, discussions and polemics, edit texts, carry out educational and pedagogical activities, publicly speak;
	Master	Methods and techniques of logical and reasoned analysis, public speech, discussion and controversy, editing of texts of professional content, the implementation of educational and pedagogical activities
the willingness to solve common tasks of professional activity with the use of information and bibliographic resources , biomedical terminology , information and communication technologies , taking into account the main requirements for information security (GPC – 1)	**Know**	Mathematical methods for solving intellectual problems and their application in medicine;
	Can	Thematic network, bibliographic resources, databases, information retrieval systems
	Master	Modern methodological principles and methodological methods in solving standard problems of professional activity Basic information transformation technologies - text, table editors, Internet search; Terminology related to modern information and telecommunication technologies in relation to solving problems of medicine and health
the readiness to use basic physical and chemical, mathematical and other natural science concepts and methods in solving professional problems (GPC – 7)	**Know**	Theoretical bases of computer science, collection, storage, search, processing, transformation, information dissemination in medical and biological systems,
	Can	Conduct text and graphic processing of medical data using standard operating system tools and common office applications, as well as application and special software;
	Master	The basic methods of statistical processing of clinical and experimental data using standard application and special software

I. STRUCTURE AND CONTENT OF THE THEORETICAL PART OF THE COURSE (18 hours)

Section 1. Basic elements of computer science (6 hours)

Lecture 1. Theoretical bases of computer science (2 hours).

Basic concepts of computer science and cybernetics. Number systems. Definition of information. Information and data (the amount of information, sources, methods of obtaining and types of data, storage media). Information Technology. Units of information. Units of memory.

Lecture 2. Application software. MS Word / Excel / Power Point (2 hours).

General purpose programs. Text editors. Electronic tables. Database management systems. Presentation preparation systems.

Lecture 3. Methods of information protection (2 hours).

Threat to information security. Ways of unauthorized access to information. Data protection. Means of information protection. Methods of information protection. Computer viruses and antivirus tools. The main types of viruses. Antivirus programs.

Section 2. Analysis of information in medicine (4 hours)

Lecture 4. Data analysis using mathematical statistics (2 hours).

Software for mathematical statistics. Features of medical data. Modern technology of statistical data analysis includes.

Lecture 5. Basic concepts of mathematical statistics (2 hours).

Preparation, preliminary analysis of information and choice of data processing methods. The choice of methods of analysis and their implementation. Parametric methods. Nonparametric methods. Use of methods of mathematical statistics for data analysis. Interpretation and presentation of the results.

Section 3. Information technology in medicine (8 hours).

Lecture 6. Telemedicine. basic concepts. stages of the formation of telemedicine. (2 hours).

The concept of telemedicine. Stages of the formation of Russian telemedicine. Telecommunication, teleprotection and tele-help. Distance learning. Telemedicine in emergency situations.

Lecture 7. Medical information systems and technologies (2 hours).

The concept of information technology. Information services in medicine. The technology of processing medical information. Technological levels of information processing in medicine.

Lecture 8. Automated doctor's workplace (2 hours).

The main functions of the workstation automated workstation. Classification of automated workplaces in health care. Features of intelligent automated workplaces. Specialized jobs. Automated workplaces and modern information and computer technologies.

Lecture 9. The concept of health informatization (2 hours).

Basic goals. Percentage of pathology. Criterion of quality of diagnostics. Comparison of diagnostic methods. Designing the health of the future.

II. STRUCTURE AND CONTENT OF PRACTICAL COURSE

Classes (36 hours)

Section 1. Basic elements of computer science (26 hours).

Lesson 1. Fundamentals of algorithmization. Arithmetic Basics The computer (2 hours).

The concept of an algorithm. Ways of recording, basic types of algorithms. Properties of the algorithm. Concept of flowchart. Types of computing processes. Number systems. Arithmetic operations in binary notation. Alan Turing. John Von Neumann.

Lesson 2. Operating systems (2 hours).

The concept of the operating system. Types of operating systems. Windows OS. OS classification. Tasks of operating systems. Functions of operating systems. History of development. Concepts of the window. Operating system interface. File system. File. User interface.

Lesson 3. Working with archiving programs (2 hours).

Methods of information compression. Properties of the compression algorithm. Basic concepts of information compression technology. The basic formats of data packing. How to use WinRar

Lesson 4. Text editor Microsoft Office Word (4 hours).

The concept of a text editor. Its purpose and function. Working with text and graphics. Insertion parameters. Tables. Insert objects.
Reviewing. Title page. References. Text field. A string of tools.

Lesson 5. Microsoft Office Excel spreadsheet (4 hours).

The functionality of the table processor. The concept of a cell. Type of cell. A string of formulas. Styles of cells. Conditional formatting. Schedule. Diagram. Functions. Search, filter and sort data.

Lesson 6. Program for preparing and viewing Microsoft Office Power Point presentations (4 hours).

Functional capabilities of MS Power Point. The designer of slides. Inserting SmartArt objects. Transitions. Animation. Slide show. Reviewing. View. Layout. Scale Structure mode.

Lesson 7: Preparing Microsoft Office Power Point presentations for a given topic (2 hours).

Chemical burns. History Development of surgery. Outstanding surgeons of the 20-21 century. The latest achievements in the field of microsurgery. History of development of neurosurgery. Biography Ivan Mikhailovich Sechenov. Especially dangerous infections of the 21st century.

Lesson 8. A full-featured system for working with Microsoft Access databases (4 hours).

The main directions in use. Structure of Microsoft Access. Communication with other programs and external databases. Creating a database based on templates. Database from scratch. The nuances of importing and linking data to other sources. The conclusion.

Lesson 9. A general lesson on the first section. Test (2 hours).

Computer science. Cybernetics. The concept of information. Properties of information. The amount of information. Algorithms. The place of informatics in the system of sciences. The device of the personal computer. Characteristics of the processor. Peripherals. Operating system. File system. Application software. Text editor. The table processor. Database.

Section 2. Analysis of information in medicine (10 hours).

Lesson 10. Basic concepts of statistics. Statistical processing of biomedical data (2 hours).

Statistical data. Methods of processing statistical data. The collection. Unit of the aggregate. Symptoms. Indicators. Indices. Statistical observation. Collection and recording of data. Absolute value. Relative value. Measures of central tendencies. Fashion. Median. Average. The average harmonic. Measures of variability. Dispersion. Standard deviation. Standard deviation. Quantitative characteristics.

Lesson 11. Graphical representation of statistical data (4 hours)

Construction of graphs, diagrams, histograms and polygons.
The value of the graphical method in the analysis and generalization of data. Statistical chart. The field of the graph. Spatial reference points of the graph. Large-scale landmarks. Classification of statistical graphs. Diagrams. Statistical maps. Linear diagrams. Bar charts. Sector diagrams. Band charts Statistical maps. Cartogram. The cardiogram. Packages of applied computer graphics Excel, Statgraf, Statistica.

Lesson 12. A general lesson on the second section. Test (4 hours).

General population and sample. Statistical distribution (variational series). Bar chart. Polygon. Position characteristics (mode, median, sample mean) and scattering (sample variance and selective mean square deviation). Estimation of the parameters of the general population from its sample. Confidence interval and confidence. Statistical testing of hypotheses. Parametric and nonparametric criteria for statistics. Functional and correlation dependencies. Correlation and regression

analysis. Coefficient of linear correlation and its properties.

Laboratory works (18 hours)

Section 3. Information technology in medicine (18 hours).

Labwork 1. Data transmission technologies in information systems (2 hours).

Types of information. Means of communication. Ways of presenting information. The concept of communication. Modern ways of information transfer. Possibilities of using the means of information transfer. Basic mechanisms of data transmission. file sharing. Data transfer. Devices, systems, programs. Technologies of data transmission in computer networks. Characteristics of computer networks. Classification of computer data transmission channels. Wireless data transmission. Programs for data transmission.

Labwork 2. Work on the Internet. Search for information. Online Services. (2 hours).

The concept of the information society. Informatization of the spheres of work and life. Local networks. Global networks. The Internet. Basic principles of the Internet. The concept of a hyperlink. Basic concepts. Specify the address of the page. Moving on hyperlinks to search system Search system. Search directories.

Labwork 3. Telemedicine. Internet resources in medicine. (4 hours).

Basic concepts of telemedicine. Stages of development of telemedicine. Teleconsulting. Teledience and tele-help. Telemedicine in emergency situations. Distance learning. Review of modern search engines: architecture, search tools. Metasearch systems. Rules for the preparation of requests. Medical resources of the Internet.

Labwork 4. Medical information systems. (4 hours).

Approaches to the classification of medical systems. Modern classification of IIAs. Automated systems for clinical healthcare. Automated systems of management level. Use of standards in health care. Standards Health Level Seven. International nomenclature and standards SNOMED CT LOINC DICOM.

Labwork 5. Automated workplace of the doctor. (2 hours).

Expert systems. AWP of the doctor. Classes and types of medical information systems. Structure and main functions of automated medical and technological information systems.

Labwork 6: A general lesson on the third section. Test (4 hours).

The concept of a computer network. Classification of computer networks. Local networks. Global networks. Server. Client. File-server. Database server. Router. Domain. IP address. Mail server. The interface of the software.

III. EDUCATIONAL-METHODICAL SUPPORT OF STUDENTS' INDEPENDENT WORK

The work program of the academic subject presents the main content of the topics, evaluation tools: terms and concepts necessary for mastering the discipline.

During mastering the course "Medical informatics. Mathematics". The student will have to do a large amount of independent work, which includes preparation for seminars and preparation of the report in the form of a presentation.

Practical classes help students to learn more deeply the educational material, acquire skills of creative work on documents and primary sources.

Plans for practical classes, their subjects, recommended literature, the purpose and objectives of its study are reported by the teacher in the introductory classes or in the curriculum for this subject.

Before starting to study the topic, it is necessary to familiarize yourself with the main issues of the practical lesson plan and the list of recommended literature.

Beginning the preparation for practical work, it is necessary, first of all, to turn to the lecture notes, sections of textbooks and teaching aids, in order to get a general idea of the place and meaning of the topic in the course being studied. Then work with additional literature, make notes on the recommended sources.

In the process of studying the recommended material, it is necessary to understand the construction of the topic under study, to identify the main points, to trace their logic and thereby penetrate the essence of the problem under study.

It is necessary to keep records of the study material in the form of a synopsis that, along with the visual, includes motor memory and allows you to accumulate an individual stock of auxiliary materials for a quick repetition of the reading, to mobilize the accumulated knowledge. The basic forms of recording: a plan (simple and detailed), extracts, abstracts.

In the process of preparation, it is important to compare sources, to think through the material being studied and to build an algorithm of actions, to carefully consider your oral presentation.

On a practical lesson, each participant should be ready to speak on all the issues raised in the plan, to show maximum activity when considering them. Speech should be convincing and reasoned, it is not allowed to read the abstract easily. It is important to show your own attitude to what is being said, express your opinion, understanding, to justify it and draw the right conclusions from what has been said. At the same time, one can refer to notes and lectures, directly to primary sources, use knowledge of monographs and publications, facts and observations of modern life, and so on.

A student who does not have time to speak in a practical lesson can present a prepared summary for the teacher to check and, if necessary, answer the questions of the teacher on the topic of a practical lesson in order to obtain a graduation rating on this topic.

Teaching and methodological support of independent work of students on the discipline "Medical physics "is presented in Appendix 1 and includes:

- characteristics of tasks for independent work of students and methodological recommendations for their implementation;
- requirements for presentation and registration of the results of independent work;
- criteria for assessing the performance of independent work.

IV. CONTROL OF ACHIEVEMENT OF THE OBJECTIVES COURSE

№ п/п	Controlled sections / topics of disciplines	Codes and stages of competence formation		Position tools	
				Formative assessment	Midterm control / exam
	Section 1. Basic Elements of Informatics	GCC -1 Ability to abstract thinking, analysis, synthesis;	**Know**	Poll Test control Presentation	Question for exam 1-25
			Can	task	assignment
			Master	test	assignment
	Section 2. Analysis of data in medicine	GPC -1 readiness to solve standard tasks of professional activity using information, bibliographic resources, medical and biological terminology, information and communication technologies and taking into account the basic information security requirements;	**Know**	Poll Test control Presentation	Question for exam 26-50
			Can	task	assignment
			Master	test	assignment
	Section 3. Information technologies in medicine	GPC -7 readiness to use basic physical, chemical, mathematical, and other natural science concepts and methods in solving professional problems;	**Know**	Poll Test control Presentation	Question for exam 51-75
			Can	task	assignment
			Master	test	assignment

Typical control tasks, methodical materials, defining the knowledge assessment procedures, skills and (or) experience activities, as well as criteria and indicators needed to assess the knowledge, skills and characterizing stages of competences formation during learning the educational program are provided in Appendix 2

V. LIST OF TEXTBOOKS AND INFORMATIONAL-METHODOLOGICAL SUPPORT OF DISCIPLINE

Basic literature

1. Biomedical Informatics for Anatomic Pathology, 2016 https://link.springer.com/chapter/10.1007/978-3-319-23380-2_9
2. Operations research for resource planning and -use in radiotherapy: a literature review, 2016 https://link.springer.com/article/10.1186/s12911-016-0390-4
3. Usability and Clinical Decision Support 2016 https://link.springer.com/chapter/10.1007/978-3-319-31913-1_4

Additional literature

1. Understanding clinical prediction models as 'innovations': a mixed methods study in UK family practice, 2016 https://link.springer.com/article/10.1186/s12911-016-0343-y
2. Clinical Terminology, 2016 https://link.springer.com/chapter/10.1007/978-3-319-30370-3_7

Electronic resources

1. National Library of Medicine - free and free access to MEDLINE http://www.ncbi.nlm.nih.gov/PubMed
2. Abstracts of the Medline database http://www.healthgate.com, http://www.kfinder.com
3. The server of the European Telemedicine Center http://www.gets.cadrus.fr
4. International Telemedicine Server of China http://www.radsci.ucla.edu/telemed/zhuling
5. The server on telemedicine and public health services http://www.duke.edu/`7Esjd1/pageone.html
6. Montana Telemedicine Union Server http://www.ahec.msu.montana.edu/mhta/default.html
7. Project Server for Telemedicine Technologies in Canada http://www.arts.mcgill.ca/gpc/telehealth.html
8. Telemedicine project in California http://www.catelehealth.org/
9. Telemedicine Network Project http://www.hon.ch/

10. Telemedicine in Canada http://www.tmed.org/

11. News server on telemedicine networks http://www.news:sci.med.telemedicine/

12. Information of the American Telemedicine Association http://www.atmeda.org/

13. The server of the Association of Telemedicine Service Providers http://www.atsp.org/

14. Telemedicine for the Army http://www.matmo.org/

15. Federal gateway on telemedicine http://www.tmgateway.org/

16. USDA server for telemedicine and distance education rules http://www.usda.gov/rus/dlt/dlml.htm

17. Materials on legislation in the field of telemedicine http://www.arentfox.com/telemedicine.html

18. Reports on telemedicine to Congress http://ntia.doc.gov/reports/telemed/index.htm

19. The Telemedicine project of the Ministry of Energy in conjunction with the National Jewish Center and Los Alamos National Laboratory http://www.acl.lanl.gov/sunrise/Medical/telemed.html

20. The HL7 program server http://www.mcis.duke.edu/standards/HL7/hl7.htm

21. Information on federal programs on telemedicine http://www.cbloch.com/

22. Telemedical projects within the framework of the veterans support program http://www.va.gov/mediauto/telemed/index.htm

23. Server for information exchange on telemedicine http://www.tie.tewlemed.org/TIEmap.html

24. Georgetown University Telemedicine Server http://www.imac.georgetown.edu/

25. Industrial project on tele-health (Canada, McGill University and industrial firms) http://www.arts.mcgill.ca/gpc/telehealth.html

26. California Telemedicine Coordination Program http://catelehealth.org/

27. Virtual Hospital of the University of Iowa http://www.indy.radiology.uiowa.edu/Virtualhospital.html

28. Oklahoma University Telemedical Center Server http://www.telemed1.ocom.okstate.edu/

29. Commercial information on telemedicine http://www.obgyn.net/

30. Dejarnette server http://www.dejarnette.com/efinegan/pacspage.htm

31. Apple Newton User Server http://www.med-amsa.bu.edu/newton.medical/

32. The company "Telemedicine Technologies" (training, implementation, launch) http://www.telemedtech.com/

33. American TeleCare, Inc. http://www.americantelecare.com/

34. The company "Interactive Medicine" (Interactive Medicine, Inc) http://www.intermed.com/

35. American Medical Development, a manufacturer of medical equipment for telemedicine http://www.americanmeddev.com/

36. ViewSend Medical, a provider of telemedicine video equipment based on personal computers http://www.klt-tele.com/

37. Information on peripheral equipment for telemedicine http://www.welchallyn.com/

38. Medical images http://www.dejarnette.com/efinegan/telemed.htm

Email addresses of some magazines

1. New England Medical Journal http://www.nejm.org/

2. Lancet http://www.thelancet.com/

3. British Medical Journal http://www.bmj.com/bmj

4. Journal of Telemedicine (Telemedicine) http://www.liebertpub.com/new/pubs/10783024/htm

5. Journal of Telemedicine Today (Telemedicine Today) http://www.telemedtoday.com/

6. American Medical Association http://www.ama.assn.org/

7. Other journals http://www.webmedlit.com/

8. World Health Organization http://www.who.ch/

9. National Medical Library of the USA http://www.nih.gov/

10. University Telemedicine Dictionary (NY) http://kelogg.cs.hscsyr.edu/

11. Information:

about medicines - http://www.pharminfo.com/, http://www.mcc.ac.uk/

oncology - http://www.cancer.med.upenn.edu/

in Psychiatry - http://www.mentalhealth.com/

on Neurology - http://www.mitpress.mit.edu/

news on medicine - http://www.dash.com/ http: //www.news.sci.med.telemedicine/

on obstetrics and gynecology - http://www.obgyn.net/.

LIST OF INFORMATION TECHNOLOGIES AND SOFTWARE

The location of the computer equipment on which the software is installed, the number of jobs	**List of licensed software**
Multimedia auditorium Vladivostok Russian island, Ayaks 10, building 25.1, RM. M723 Area of 80.3 m2 (Room for independent work)	Windows Seven enterprice SP3x64 Operating System Microsoft Office Professional Plus 2010 office suite that includes software for working with various types of documents (texts, spreadsheets, databases, etc.); 7Zip 9.20 - free file archiver with a high degree of data compression; ABBYY FineReader 11 - a program for optical character recognition; Adobe Acrobat XI Pro 11.0.00 - software package for creating and viewing electronic publications in PDF; WinDjView 2.0.2 - a program for recognizing and viewing files with the same format DJV and DjVu.

In order to provide special conditions for the education of persons with disabilities all buildings are equipped with ramps, elevators, lifts, specialized places equipped with toilet rooms, information and navigation support signs.

VI. METHODICAL INSTRUCTIONS ON SUBJECT STUDYING

During the study course "Medical informatics. Mathematics" a variety of methods and tools are offered for the development of educational content: lectures, practical exercises, examinations, tests, independent work of students.

Lecture is the main active form of classroom teaching, clarifying of basic and most difficult theoretical sections of human anatomy, which involves intense mental activity of the student, and is particularly difficult for first-year students. Lecture should always be informative, developing, educational and organizing

character. Lecture notes help to assimilate the theoretical material discipline. During the lecture, it is necessary to write the most important and desirable to own wording to better remember the material.

Lecture notes are useful when it is written by the student.

You can develop your own pattern of words cuts. The name of those sections can be isolated by colored markers or pens. In the lecture the teacher gives only a small portion of the information on topic or other topics, which are described in textbooks. Therefore, it is always necessary to use the basic textbook at work with lecture notes and additional literature that is recommended in the discipline.

In teaching of lecture course on the subject "Human anatomy" as a form of active learning are used: lecture - conversation lecture-visualization, which are based on the knowledge acquired by students in other disciplines: "Biology", "Chemistry", "Physics".

To illustrate the verbal information can be used presentations, tables, diagrams on the board. During the presentation of lecture material are placed problematic issues or issues with the discussion items.

Lecture - Visualization

Lecturing is accompanied by display tables, slides, which facilitates better perception of the material. Lecture - visualization requires certain skills - verbal presentation of the material must be accompanied by and integrated with visual form. The information contained in the form of diagrams on the blackboard, tables, slides, allows you to create the problematic issues, and contribute to the development of professional thinking of future specialists.

Lecture - discussion.

Lecture - discussion, in pedagogy this form of learning is called "dialogue with the audience". It is the most common form of active learning and allows engaging students in the learning process, as there is direct contact with the teacher and audience. Such contact is achieved during the lectures, when students are

asked informational and problem or when the students can ask lecturer questions themselves. Questions are offered for of all audience, and every student may offer their answer, another student can supply them. At the same time, it is possible to gradually reveal more active students and try to activate the students who do not participate in the work. This form of lectures allows students to engage in work, to increase their attention, thinking, get a collective experience, and learn how to form questions. Lecture-conversation advantage is that it allows you to attract the students' attention to the most important issues of the theme, to determine the content and temp of presentation of educational material.

Lecture - Press Conference

At the beginning of classes, a teacher calls the lecture topic and asks the students to put questions to him in writing on this topic. Each student should for 2-3 minutes to formulate the most interesting questions on topic of the lecture, write them on a piece of paper and pass a note to the teacher.

For 3-5 minutes a teacher sorts questions about their semantic content and begins to lecture. The material is presented in the form of a connected theme disclosing, and not as a response to every question, but in the process of the lectures appropriate responses are formulated. At the end of the lecture the teacher conducts a final assessment of the issues, identifying the knowledge and interests of students.

Practical classes on discipline "Medical informatics. Mathematics"

Practical classes - a collective form of consideration of educational material. The seminars, which are also one of the main types of practical classes for in-depth study of discipline going online.

At the lessons the questions related to the subject are puzzled out, then teachers and students together hold discussions, which aims at consolidating the discussion material, formation of skills, to debate, to develop independence and critical thinking, the ability of students to orient in large information flows, to

develop and defend their own position on the problem issues of educational disciplines.

The active learning methods are used in practical classes: press conference, detailed discussion, debate. The detailed discussion suggests the preparation of students for each issue of the lesson plan with common for all the recommended list of obligatory and additional literature.

The reports are prepared by the students on the previously proposed theme.

The dispute in the group has a few advantages. The dispute may be caused by the teacher during the classes or planned him previously.

During the debate, students formed their inventiveness, speed of mental reactions. Press conference. Teacher instructs 3-4 students to prepare summary reports. Then one of the members of this group makes a report. After the presentation, students asked questions. Speaker and other responsible members of the expert answer the questions. Based on the questions and answers the teacher organizes a creative discussion.

VII. MATERIAL AND TECHNICAL EQUIPMENT OF SUBJECT

For carrying out practical work, as well as for organizing independent work, students have access to the following laboratory equipment and specialized classrooms that meet applicable sanitary and fire regulations, as well as safety requirements for educational and research and production work:

Name of equipped premises and rooms for independent work	List of basic equipment
Computer classroom School of Biomedicine. Laboratory building aud. L403, 15 seats	Screen with an electric drive 236 * 147 cm Trim Screen Line; DLP Projector, 3000 ANSI Lm, WXGA 1280x800, 2000: 1 EW330U Mitsubishi; The subsystem of specialized fixing equipment CORSA-2007 Tuarex; Video switching subsystem: DVI DXP 44 DVI Pro Extron matrix switcher; DVI extension cable for twisted pair DVI 201 Tx / Rx Extron; Audio switching and sound reinforcement subsystem; ceiling speaker system SI 3CT LP Extron; DMP 44 Extron digital audio processor; extension for the control controller IPL T CR48; Wireless LANs for students are provided with a system based on 802.11a / b / g / n access points 2x2 MIMO (2SS). Monoblock HP RgoOpe 400 All-in-One 19.5 (1600x900), Core i3-4150T, 4GB DDR3-1600 (1x4GB), 1TB HDD 7200 SATA, DVD +/- RW, GigEth, Wi-Fi, BT, usb kbd / mse, Win7Pro (64-bit) + Win8.1Pro (64-bit), 1-1-1 Wty
	Monoblock Lenovo C360G-i34164G500UDK; Projection screen Projecta

Multimedia auditory	Elpro Electrol, 300x173 cm; Multimedia projector, Mitsubishi FD630U, 4000 ANSI Lumen, 1920x1080; Mortise interface with TLS TAM 201 Stan automatic cable retractor; Document Camera Avervision CP355AF; Sennheiser EW 122 G3 UHF range microphone microphone wireless system as part of a wireless microphone and receiver; Video conferencing codec LifeSizeExpress 220- Codeconly- Non-AES; Network camera Multipix MP-HD718; Dual LCD panels 47 ", Full HD, LG M4716CCBA; Audio switching and sound reinforcement subsystem; centralized uninterrupted power supply
Reading rooms of the FEFU Scientific Library with open access to the Foundation (Building A - Level 10)	HP RgoOpe 400 All-in-One 19.5 (1600x900), Core i3-4150T, 4GB DDR3-1600 (1x4GB), 1TB HDD 7200 SATA, DVD +/- RW, GigEth, Wi-Fi, BT, usb kbd / mse, Win7Pro (64-bit) + Win8.1Pro (64-bit), 1-1-1 Wty Internet access speed 500 Mbit / s. Jobs for people with disabilities are equipped with braille displays and printers; equipped with: portable devices for reading flat-printed texts, scanning and reading machines with a video optimizer with the ability to adjust color spectra; magnifying electronic loops and ultrasonic markers

Appendix 1

MINISTRY OF EDUCATION AND SCIENCE OF RUSSIAN FEDERATION
The Federal state autonomous educational institution
higher education
"Far Eastern Federal University"
(FEFU)

SCHOOL OF BIOMEDICINE

EDUCATIONAL AND METHODICAL SUPPORT INDEPENDENT WORK OF STUDENTS

on the subject " Medical Informatics, Mathematics "

Specialty 31.05.01 General Medicine

Full-time training

Vladivostok
2016

Independent work includes:

1) The library or homework with educational literature and lecture notes,
2) Preparation for practical training,
3) Preparation for testing and control interview.

Order of independent work of the students is determined by schedule plan of this work in the subject.

The schedule plan of independent work in the subject.

№ п/п	Date / terms of performance	Kind of independent work	Estimated time standards for performance	Kinds of control
1	During the 1-6 weeks	Working with literature and lecture notes, preparing to the practical lesson, control lesson	3 hours	Work on practical class with computer programs, verbal response, computer testing. Text of the essay file The text and electronic version of a literature review on the essay topic
2	During the 7-12 weeks	Working with preparations, literature and lecture notes, preparing to the control lesson	3 hours	Work on practical class with macroscopic preparations, verbal response, computer testing. Text of the essay file Presentation on the essay The text and electronic version of a literature review on the essay topic
3	During the 13-18 weeks	Working with preparations, literature and lecture notes, preparing to the control lesson	3 hours	Work on practical class with macroscopic preparations, verbal response, computer

				testing.

Topics for essays and presentations

Academic plan on Anatomy includes 9 hours of independent work, within this time 3 verbal presentations are performed on the proposed topics.

1. Possibilities of mathematical modeling of functional systems of the body.
2. Methods of automation of diagnostic studies.
3. Modern medical information systems and the principles of their classification.
4. Automated systems for the removal, registration, processing and storage of medical data.
5. Automated systems of advisory computer diagnostics.
6. Computer technologies in application to the solution of problems of medicine and public health.
7. Telecommunications technologies in solving the problems of the diagnostic and diagnostic process and scientific search.
8. Telemedicine in the system of practical public health.
9. Automated information systems of medical institutions.
10. Methods of medical informatics as an instrument of evidence-based medicine.
11. Types and evaluation of medical and biological data.
12. Collection and initial processing of biomedical data.
13. Assessment of medical and biological data on species and quality.
14. Methods for assessing the objectivity of medical information.
15. Methods for assessing the reliability of medical information using modern computer applications.
16. Application of modern information technologies in the health care system.
17. Comparative characteristics of the most commonly used hardware of modern health.
18. Ways of applying the results of medical information in medical institutions.

19. Influence of the results of medical information on the speed of solving the problem in modern conditions.
20. Application of modern hardware in the treatment of the most serious diseases.

Methodical instructions for preparation of presentations

For preparation of the presentation ito use: PowerPoint, MS Word, Acrobat Reader, LaTeX-ovsky beamer package. The simplest program for creating presentations - Microsoft PowerPoint. To prepare the presentation, you must process the information gathered while writing the essay.

The sequence of preparation of the presentation:

1. Clearly formulate the purpose of the presentation.
2. Determine what will be the presentation format: a live performance (then, how much will its duration) or e-mailing (what will be the presentation of context
3. Select all the content part of the presentation and build a logical chain of presentation.
4. Determine the key points in the content of the text and highlight them.
5. Determine the visualization types (images) to display them on the slides according to the logic, purpose and specificity of the material.
6. Choose design and format slides (the number of images and text, their location, color and size).
7. Check the visual perception of the presentation.

The methods of visualization are illustrations, images, charts, tables. Illustration is representation of real-life visual series.

The images - in contrast to the illustration - metaphor. Their purpose - to cause emotion and create a relationship to it, to influence an audience. With the help of well-designed and submitted images, information can long remain in memory of the person.

Diagram - visualization of quantitative and qualitative relations. They are used to demonstrate the convincing data for spatial thinking in addition to the logical.

Table - concrete, visual and accurate data display. Its main purpose - to structure the information, which sometimes facilitates the perception of data by the audience.

Practical advices on preparing presentations

- printed text + slides + handout should be prepared separately;
- slides - visual presentation of information, which must contain a minimum of text, images maximum carrying semantic load, to look clearly and simply;
- the text content of the presentation - speaking or reading, which should include the arguments, facts, reasoning, and emotions;
- recommended number of slides 17-22;
- The regulated information for the presentation of: topic, name and initials of the speaker; communication plan; summary of what has been said; list of references;

Handout - should provide the same depth and scope as the live performance: the people have more confidence in what they can carry, than disappearing images, words are forgotten and slides and handouts remains constant tangible reminder; it is important to distribute the handout at the end of the presentation; Handouts must differ from the slide, should be more informative.

Methodical instructions for the preparation to practical classes

Control of results of independent work carried out during the practical classes, oral interviews, interviews, solving case studies, tests, including by testing.

1. For practical classes the student should be prepared: to repeat the lecture material, read the required section in the textbook on the subject.

2. The lesson begins with a quick frontal verbal questioning on a given topic.

3. At the lessons, students work with a collection of preparations and atlases.

4. For classes, it needs to have a notebook to write theoretical material, a textbook and an atlas.

5. The study of anatomical preparations starts with the right location.

6. After viewing the preparation, students define the basic details of its structure.

7. At the end of class the teacher gives you homework on a new topic and offers to make tests on anatomical preparations, which have been studied in class.

Presentations and students' activity are assessed by current point.

Methodical instructions for preparation of the report

1. Selection of literature on a chosen topic from the recommended basic and additional literature, which is proposed in the work program of the discipline, as well as work with the resources of the network "Internet", indicated in the work program.

2. Work with the scientific publications and textbooks is not limited to reading material, it is also necessary to analyze the collected literature and to compare the presentation of material on the theme in different literary sources, to collect material, so that it reveals the theme of the report.

3. The analyzed material should be noted. Most importantly, it should not be just a conscientious rewriting source texts from the selected literature without any commentary and analysis.

4. Having worked for literature and student report makes a plan that is the basis for the preparation of the report.

5. The report should be logically built. Students expound material integrally, coherently, consistently and make conclusions. It is desirable that the student could express his opinion on the formulated problem.

6. The duration of the report is not more than 7-10 minutes. Report told, not read on paper.

Criteria for evaluation of the abstract.

The stated understanding of the abstract as a holistic copyright text defines the criteria for its evaluation: the novelty of the text; the validity of the choice of source; the degree of disclosure of the essence of the issue; compliance with the requirements for registration.

The novelty of the text: a) the relevance of the research topic; b) novelty and independence in the formulation of the problem, the formulation of a new aspect of the well-known problem in the establishment of new connections

(interdisciplinary, intra-subject, integration); c) the ability to work with research, critical literature, systematize and structure the material; d) the appearance of the author's position, independence of assessments and judgments; d) stylistic unity of the text, the unity of genre features.

The degree of disclosure of the essence of the question: a) the plan compliance with the topic of the abstract; b) compliance with the content of the topic and plan of the abstract; c) completeness and depth of knowledge on the topic; d) the validity of the methods and methods of work with the material; e) the ability to generalize, draw conclusions, compare different points of view on one issue (problem).

The validity of the choice of sources: a) evaluation of the used literature: whether the most famous works on the topic of research are involved (including recent journal publications, recent statistics, summaries, references, etc.).

Compliance with the requirements for registration: a) how correct the references to the used literature, references are; b) assessment of literacy and presentation culture (including spelling, punctuation, stylistic culture), knowledge of terminology; c) compliance with the requirements for the volume of the abstract.

The reviewer should clearly state the remark and questions, preferably with references to the work (possible on specific pages of the work), to research and evidence that the author did not take into account.

The reviewer can also indicate: whether the student addressed the topic earlier (essays, written works, creative works, Olympiad works, etc.) and whether there are any preliminary results; how the graduate conducted the work (plan, intermediate stages, consultation, revision and processing of the written or lack of a clear plan, rejection of the recommendations of the head).

The student submits an essay for review no later than a week before the defense. The reviewer is the teacher. Experience shows that it is advisable to acquaint the student with the review a few days before the defense. Opponents are appointed by the teacher from among the students. For an oral presentation, a

student needs about 10–20 minutes (approximately as long as he answers with tickets for the exam).

Grade 5 is set if all the requirements for writing and defending an essay are fulfilled: the problem is indicated and its relevance is justified, a brief analysis of various points of view on the problem under consideration is made and one's own position is logically presented, conclusions are formulated, the topic is fully disclosed, the volume is met, the external requirements are met design, given the correct answers to additional questions.

Grade 4 - the basic requirements for the abstract and its protection are met, but there are shortcomings. In particular, there are inaccuracies in the presentation of the material; there is no logical sequence in the judgments; not sustained volume of the abstract; there are omissions in the design; Additional questions for the protection given incomplete answers.

Grade 3 - there are significant deviations from the requirements for referencing. In particular: the topic is covered only partially; factual errors in the content of the abstract or when answering additional questions; during the protection there is no output.

Grade 2 - the topic of the essay has not been disclosed, there is a significant misunderstanding of the problem.

Grade 1 - student's essay not submitted

Appendix 2

MINISTRY OF EDUCATION AND SCIENCE OF RUSSIAN FEDERATION
The Federal state autonomous educational institution
higher education
"Far Eastern Federal University"
(FEFU)

SCHOOL OF BIOMEDICINE

FUND OF ASSESSMENT TOOLS

on the subject "Medical Informatics. Mathematics"

Specialty 31.05.01 General Medicine
Full-time training

Vladivostok
2016

Fund of assessment tools passport

The passport is filled in accordance with the Regulations on the Funds of assessment tools of educational programs of higher education - undergraduate, specialist's and master's programs of Far Eastern Federal University, approved by order of the rector of 12.05.2015 №12-13-850.

Code and formulation of competence.	**Stages of formation of competence**	
GCC -1 Ability to abstract thinking, analysis, synthesis;	**Know**	Fundamentals of abstract thinking, logical and reasoned analysis;
	Can	Conduct a logical and reasoned analysis, discussions and polemics, edit texts, carry out educational and pedagogical activities, publicly speak;
	Master	Methods and techniques of logical and reasoned analysis, public speech, discussion and controversy, editing of texts of professional content, the implementation of educational and pedagogical activities
GPC -1 readiness to solve standard tasks of professional activity using information, bibliographic resources, medical and biological terminology, information and communication technologies and taking into account the basic information security requirements;	**Know**	Mathematical methods for solving intellectual problems and their application in medicine;
	Can	Thematic network, bibliographic resources, databases, information retrieval systems
	Master	Modern methodological principles and methodological methods in solving standard problems of professional activity Basic information transformation technologies - text, table editors, Internet search; Terminology related to modern information and telecommunication technologies in relation to solving problems of medicine and health
GPC -7 readiness to use basic physical, chemical, mathematical, and other natural science concepts and methods in solving professional problems;	**Know**	Theoretical bases of computer science, collection, storage, search, processing, transformation, information dissemination in medical and biological systems,
	Can	Conduct text and graphic processing of medical data using standard operating system tools and common office applications, as well as application and special software;

Code and formulation of competence.	Stages of formation of competence	
	Master	The basic methods of statistical processing of clinical and experimental data using standard application and special software

CONTROL OF ACHIEVEMENT OF THE OBJECTIVES COURSE

№ п/п	Controlled sections / topics of disciplines	Codes and stages of competence formation		Position tools	
				Formative assessment	Midterm control / exam
	Section 1. Basic Elements of Informatics	GCC -1 Ability to abstract thinking, analysis, synthesis;	**Know**	Poll Test control Presentation	Question for exam 1-25
			Can	task	assignment
			Master	test	assignment
	Section 2. Analysis of data in medicine	GPC -1 readiness to solve standard tasks of professional activity using information, bibliographic resources, medical and biological terminology, information and communication technologies and taking into account the basic information security requirements;	**Know**	Poll Test control Presentation	Question for exam 26-50
			Can	task	assignment
			Master	test	assignment
	Section 3. Information technologies in medicine	GPC -7 readiness to use basic physical, chemical, mathematical, and other natural science concepts and methods in solving professional problems;	**Know**	Poll Test control Presentation	Question for exam 51-75
			Can	task	assignment
			Master	test	assignment

Scale of competence level assessment

Code and formulation of competence.	Stages of formation of competence		Criteria	Indicators	Points
GCC -1 Ability to abstract thinking, analysis, synthesis;	Knows (entry level)	Fundamentals of abstract thinking, logical and reasoned analysis;	Knowledge of the basics of abstract thinking, logical and reasoned analysis;	Formed structured systematic knowledge of the basics of abstract thinking, logical and reasoned analysis;	65-71
	Able (advanced level)	Conduct a logical and reasoned analysis, discussions and polemics, edit texts, carry out educational and pedagogical activities, publicly speak;	Ability to carry out a logical and reasoned analysis, discussion and debate, edit texts, to carry out educational and teaching activities, to speak in public;	Ready and able to carry out a logical and reasoned analysis, discussion and debate, edit texts, to carry out educational and teaching activities, to speak in public;	71-84
	Master (high level)	Methods and techniques of logical and reasoned analysis, public speech, discussion and controversy, editing of texts of professional content, the implementation of educational and pedagogical activities	Skills of logical and reasoned analysis, public speech, discussion and polemics, editing of texts of professional content, implementation of educational and pedagogical activities	Systematic application of the skills of logical and reasoned analysis, public speech, discussion and controversy, editing of texts of professional content, the implementation of educational and pedagogical activities	85-100
GPC -1 readiness to solve standard tasks of professional	Knows (entry level)	Mathematical methods for solving intellectual problems and their application	Knowledge of mathematical methods for solving intellectual	Formed structured systematic knowledge of	65-71

activity using information, bibliographic resources, medical and biological terminology, information and communication technologies and taking into account the basic information security requirements;		in medicine;	problems and their application in medicine;	mathematical methods for solving intellectual problems and their application in medicine;	
	Can (advanced level)	Thematic network, bibliographic resources, databases, information retrieval systems	The ability to use in the professional activities thematic network, bibliographic resources, databases, information retrieval systems	Ready and able to use in their professional activities thematic network, bibliographic resources, databases, information retrieval systems	71-84
	Master (high level)	Modern methodological principles and methodological methods in solving standard problems of professional activity Basic information transformation technologies - text, table editors, Internet search Terminology related to modern information and telecommunication technologies in relation to solving problems of medicine and health	Skill of application: modern methodological principles and methodical methods in solving problems of professional activity Basic information conversion technologies: text, table editors, Internet search Terminology related to modern information telecommunication technologies applied to solving problems of medicine and health	Systematic application of the skills of modern methodological principles and methodological methods in solving problems of professional activity Basic information conversion technologies: text, table editors, Internet search Terminology related to modern information telecommunication technologies applied to solving problems of medicine and health	85-100
GPC -7 readiness	Knows	Theoretical bases of	Knowledge of the	Formed	65-71

to use basic physical, chemical, mathematical, and other natural science concepts and methods in solving professional problems;	(entry level)	computer science, collection, storage, retrieval, processing, transformation, dissemination of information in medical and biological systems;	theoretical foundations of computer science, storage, search; processing, transformation, dissemination of information in medical and biological systems;	structured systematic knowledge of the theoretical foundations of informatics, storage, retrieval; processing, transformation , dissemination of information in medical and biological systems;	
	Can (advanced level)	Conduct textual and graphic processing of medical data using standard operating system tools and common office applications, as well as application and special software;	Ability to conduct textual and graphic processing of medical data using standard operating system tools and common office applications, as well as application and special software;	Ready and able to carry out textual and graphic processing of medical data using standard operating system tools and common office applications, as well as application and special software tools;	71-84
	Master (high level)	Basic methods of statistical processing of clinical and experimental data with application of standard applied and special software;	Skill in applying basic methods of statistical processing of clinical and experimental data with standard application and special software techniques;	Systematic application of the skills of basic methods of statistical processing of clinical and experimental data with the methods of standard applied and special software;	85-100

Methodical recommendations for the final evaluation of the subject development

The interim attestation of students. The interim attestation of students on the subject " Medical Informatics. Mathematics " is carried out in accordance with the local regulations of the Far Eastern Federal University and is obligatory.

Passing the exam orally suggests as an interim attestation.

Evaluation tools for intermediate certification

Questions for the exam on the subject " Medical Informatics. Mathematics "

1. Time series: definition, constituent elements.

2. Classification of time series.

3. What is a trend? Ways of representing the trend.

4. The main types of trend. Methods used to directly identify the trend.

5. What is Medical Information Systems?

6. What is Medical Informatics?

7. The subject, object and purpose of medical informatics. What is "Information" and "Medical Information"?

8. How is biological signal converted into medical information? Explain.

9. What are the types of medical information?

10. What components ensure the availability of medical information?

11. How is the information classified according to the degree of relevance? Explain.

12. What is Health Informatization? What is the main goal of informatization of health care?

13. List the functions of informatization of health care. Explain.

14. List the objectives of the development of health informatization?

15. What is software?

16. What is the operating system? The main functions of the operating system.

17. Classification of medical resources and Internet services.

18. Telemedicine. Directions in the use of telecommunication technologies. History of telemedicine.

19. Standardization of information in telemedicine. Telemedical centers.

20. What is a text editor?

21. List the main elements of the Microsoft Office Word 2007 interface. What are they for?

22. What is a "Header Line"? What does it contain? Describe.

23. What is the Menu Bar of Word? What tabs does it consist of? Describe each tab.

24. What is the "Toolbar". What is it for? What does it include? Describe.

25. What is an information system? For what it is intended.

26. What is a medical information system (IIA)?

27. List the functions of IIAs.

28. What properties should the IIAs possess?

29. List the main tasks of IIAs.

30. Classification of medical information systems by levels. Describe each level.

31. What activities should be automated based on IIAs?

32. List the main types of IIAs and their purpose.

33. List the IIAs for treatment and prevention facilities and characterize them.

34. What is Microsoft Excel for?

35. What is a spreadsheet?

36. What tasks does the spreadsheet solve?

37. List the main types of data.

38. Purpose of computer networks.

39. Classification of computer networks.

40. Special medical computer networks.

41. Describe the stages of processing information in the "doctor-patient" system.

42. What is an Automated Workstation (AWP)?

43. Which components are part of the workstation?

44. List the general principles of creating workstations.

45. What is the structure of the workstation?

46. What is a medical database?

47. What is the medical data.

48. What types of medical information should be shared?

49. What is an electronic document?

50. What is meant by the electronic history of the disease?

51. Modeling. The main types of modeling. Examples

52. Computer modelling. The main stages of computer simulation.

53. Model of natural population growth.

54. Model of change in population size in the presence of competition between individuals.

55. Pharmacokinetic model (single administration of the drug).

56. Pharmacokinetic model (continuous administration of the drug at a constant rate).

57. Information model of therapeutic and diagnostic process.

58. Laboratory Information Systems (LIS). The main components of LIS.

59. The main functions of laboratory information systems.

60. The concept of medical instrument-computer systems (MPCS).

61. Principles of construction of medical instrument-computer systems. Examples of MICS.

62. Classification of medical instrumentation and computer systems by functionality and purpose. Examples

63. Electrocardiography. The main types of leads. Use in medicine. Rheography. The use of rheography in medicine.

64. Electroencephalography. Use in medicine. Polygraphy. The complex of technical means for printing. Spirography The use of spirography in medicine.

65. The main types of clinical monitoring and its purpose.

66. Digital image processing. Main steps. Computer image processing.

67. Theory of color vision. Imaging devices.

68. Diagnostic decision support systems. Expert systems of intellectual support for the interpretation of laboratory data.

69. Medical Information Systems (MIS). The main tasks of the IIA. The functionality of medical information systems.

70. The main groups of IIA health care facilities (list). MIS LPU: IP advisory points, information banks of medical institutions and services, banks and databases, screening systems.

71. Information systems of health facilities: Hospital (tasks of this system.).

72. Information systems of scientific research institutes and universities.

73. Diagnostics. Causes of diagnostic errors of the doctor. Basics of computational diagnostics. The main stages of automatic medical diagnosis. Medical diagnostic systems with the use of computers (structure, advantages and disadvantages).

74. The use of computers in the treatment process. Block diagram of the cycle of automation of the treatment process. Information systems of operative medical control. Device and appointment.

75. The concept of ACS "Health". Main tasks. The structure of the hospital ACS. The structure of the ACS "Pharmacy".

Evaluation tools for the current attestation

Control tests are designed for the students studying the course "Medical informatics, mathematics".

The tests are necessary for the control of knowledge during the current interim attestation, and for the evaluation of knowledge and thus to get credit for course.

While working with tests the student is asked to select one answer from the three - four proposed. At the same time the tests are not identical in their complexity.

Offered tests contain several variants of correct answers. The student must select all the correct answers.

The tests are designed both for individual and collective solving them. They can be used in the process both classroom lessons and independent work. The tests, required for the control of knowledge, are chosen in the process of the intermediate certification by each teacher individually.

The results of the test tasks are evaluated by a teacher on a five-mark grading scale

Evaluation of **"excellent"** is got by student at the correct answer to more than 90% of the proposed tests.

Evaluation of **"good"** getting - at the correct answer by more than 70% of tests.

Evaluation of **"satisfactory"** - at the correct answer to 50% of the offered tests

TEST TASKS ON SUBJECT " Medical Informatics. Mathematics "

Methods of remote provision of medical care based on the use of modern information and telecommunication technologies are ...

1) telemedicine;

2) remote medical assistance;

3) videoconference;

4) video medication;

5) telemonitoring.

2. "multi-point-to-point" communication, when the data of many patients are transferred to a consultative center, is organized within the framework of such telemedicine technology as ...

1) telemedicine consultation;

2) telemonitoring;

3) telemedicine meeting;

4) telemedicine lecture;

5) videoconference.

3. communication on the network scheme ("many points"), as a result of which all participants can communicate with each other, organized in the framework of such telemedicine technology as ...

1) telemedicine consultation;

2) telemonitoring;

3) telemedicine meeting;

4) telemedicine lecture;

5) remote medical assistance.

4. a point-to-multipoint connection, in which a lecturer (teacher) can address all participants simultaneously, is organized within the framework of such telemedicine technology as ...

1) telemedicine consultation;

2) telemonitoring;

3) telemedicine meeting;

4) telemedicine lecture;

5) remote medical assistance.

5. point-to-point communication, which provides discussion of the patient by the attending physician with a consultant, is organized in the framework of such telemedicine technology as ...

1) telemedicine consultation;

2) telemonitoring;

3) telemedicine meeting;

4) telemedicine lecture;

5) remote medical assistance.

6. The regime, which implies the communication of the patient or his attending physician with the consultant in an interactive mode, is ...

1) on-line mode;

2) off-line mode;

3) read mode;

4) recording mode;

5) the mode of delayed data transmission.

7. The following equipment is used for teleconsultations:

1) digitizer;

2) plotter;

3) video conferencing system;

4) pos systems;

5) a video camera.

8. type of medical consultation, when an expert consults a doctor with a sick person or a doctor without a patient, is ...

1) medical telemedicine consultation;

2) telemedical functional or laboratory examination;

3) advice to rescuers;

4) advice to the public;

5) a consultation.

9. type of medical consultation, when a specialist doctor advises employees of mobile rescue teams, is ...

1) medical telemedicine consultation;

2) telemedical functional or laboratory examination;

3) advice to rescuers;

4) advice to the public;

5) a consultation.

10. type of medical consultation, when residents are given the opportunity to consult a doctor, is

1) medical telemedicine consultation;

2) telemedical functional or laboratory examination;

3) advice to rescuers;

4) advice to the public;

5) a consultation.

11. type of medical consultation, when the transfer of objective data about the patient from medical equipment is made, is

1) medical telemedicine consultation;

2) telemedical functional or laboratory examination;

3) advice to rescuers;

4) advice to the public;

5) a consultation.

12. The system of modern telemedicine ekg equipment is:

1) "space bridge";

2) "teleradiology";

3) "cardiosystems";

4) "telemetry";

5) "telecard".

13. Telemedicine technologies in the Russian Scientific Center for Surgery Rams began to be introduced during the period:

1) mid 80-ies of the twentieth century;

2) the late 80-ies of the twentieth century;

3) mid-90-ies of the twentieth century;

4) the end of the 90-ies of the twentieth century;

5) 2005 year.

14. Videoconferencing systems work according to the protocol:

1) FTP;

2) H320 (ISDN);

3) DNS;

4) SMTP;

5) Telnet.

15. Videoconferencing systems work according to the protocol:

1) FTP;

2) IETF;

3) HTTP;

4) DTN;

5) H323 (TCP / IP).

16. The regional target program "Support to the development of primary health care in rural areas of the Krasnoyarsk Territory" was approved in ...

1) 1970;

2) 1985;

3) 1990;

4) 2004;

5) 2011 year.

17. The main tasks of telemedical centers of medical institutions of regional level are

A) counseling patients from remote lpu;

B) preparation of patient data in electronic form according to the established requirements;

C) timely submission of applications for teleconsultation;

D) development of new telemedicine technologies, generalization of experience in the form of scientific publications;

D) methodical help to doctors of remote health facilities;

1) A, B, C;

2) A, D, D;

3) B, C, D;

4) B, D, D;

5) A, B, D.

18. The advantages of telemedicine are:

1) poor quality of communication channels;

2) increased losses of time in the health care system;

3) overcoming difficulties in the diagnosis and treatment of complex clinical cases;

4) increase the cost of staff training;

5) increased transportation costs for both patients and doctors.

19. choose the simplest technology for telemedicine consultations

1) telemetry;

2) e-mail;

3) videoconference;

4) telemonitoring;

5) a consultation.

20. On-line mode is mandatory for:

1) telemetry;

2) teleconsultation;

3) distance learning;

4) videoconferencing;

5) deferred counseling by e-mail

21. The responsibility for the result of treatment appointed during the telemedicine

1) a consulted physician;

2) the attending physician;

3) the head of the telemedicine consultation center;

4) the consultant;

5) network administrator.

22. Telemedicine technologies include:

1) telemetry;

2) artificial intelligence;

3) mobile communication 4G;

4) 3D printers;

5) Regenerative medicine.

23. The greatest capacity is possessed by:

1) telephone line (modem, ADSL);

2) a dedicated line;

3) the radio channel;

4) satellite channel;

5) optical fiber channel.

24. The founder of electrocardiography is:

1) Alexander Bell;

2) Ivan Mikhailovich Sechenov;

3) William Einthoven;

4) Nikolai Vasilievich Sklifasovsky;

5) Albert Yuthras.

25. the transmission of the electrocardiogram was first carried out by telephone the following year:

1) 1855;

2) 1905;

3) 1950;

4) 1985;

5) 2010.

26. The greatest economic effect from telemedicine consultations is observed:

1) in emergency situations (accidents, accidents);

2) in a situation where there is a long distance between the consultant and the consultant;

3) when conducting a large number of telemedicine consultations;

4) during complex telemedicine consultations;

5) when conducting a small number of telemedicine consultations.

27. The process of verifying the access of a health worker to the patient's electronic data in a mission is called

1) identification;

2) authentication;

3) initiation;

4) personalization;

5) personification.

28. The process of identifying the identity of an employee starting a session with a

1) identification;

2) authentication;

3) initiation;

4) personalization;

5) personification.

29. from the introduction of a comprehensive medical information system, a physician-therapist can get a useful effect

1) simplicity and efficiency of monitoring indicators of the effectiveness of health facilities;

2) operative access to complete information about the patient in electronic form;

3) simplification of reporting to health authorities and the CHI fund;

4) simplification of personalized accounting of medical devices;

5) simplification of the procedure for calculating the cost of medical services.

30. from the introduction of an integrated medical information system, the head of a medical institution:

1) simplicity and efficiency of monitoring indicators of the effectiveness of health facilities;

2) simplification of reporting to health authorities and the MHI fund;

3) simplification of personalized accounting of medical devices;

4) simplification of the procedure for calculating the cost of medical services;

5) all of the above.

31. Operational work to support the working capacity of the mission in a medical institution, as a rule, carries out

1) administration of the medical institution;

2) information service;

3) doctor - medical statistician;

4) treating doctors;

5) specialists of the company - supplier of MIS.

32. from the introduction of a comprehensive medical information system, a physician-therapist can get the following beneficial effect

1) simplicity and efficiency of monitoring indicators of the effectiveness of health facilities;

2) operative access to complete information about the patient in electronic form;

3) simplification of reporting to health authorities and the CHI fund;

4) simplification of personalized accounting of medical devices;

5) simplification of the procedure for calculating the cost of medical services.

33. Is, containing medical information banks for information service of medical institutions and health management services, is ...

1) medical and technological IS;

2) information and reference systems;

3) statistical information systems;

4) research IS;

5) learning IS.

34. IS, intended for information support of the processes of diagnostics, treatment, rehabilitation and prevention of patients in medical and preventive institutions, is ...

1) medical and technological IS;

2) information and reference systems;

3) statistical information systems;

4) research IS;

5) learning IS.

35. Is, intended for health authorities, is ...

1) medical and technological IS;

2) information and reference systems;

3) statistical information systems;

4) research IS;

5) learning IS.

36. The basic unit of accumulation and storage of data in medical information systems is:

1) the database;

2) cell or record;

3) illness;

4) the person;

5) medical institution.

37. information (messages, data) regardless of the form of their presentation:

1) information;

2) information technology;

3) the information system;

4) information and telecommunications network;

5) owner of information.

38. processes, methods of searching, collecting, storing, processing, providing, disseminating information and ways to implement such processes and methods:

1) information;

2) information technology;

3) the information system;

4) information and telecommunications network;

5) owner of information.

39. A person who independently created information or obtained the right to authorize or restrict access to information on the basis of a law or contract:

1) source of information;

2) the consumer of information;

3) information destroyer;

4) the information carrier;

5) owner of information.

40. A technological system designed to transmit information via communication lines, access to which is carried out using computer aids is:

1) the database;

2) information technology;

3) the information system;

4) information and telecommunications network;

5) medical information system.

41. The requirement that a person who has received access to certain information does not require the transfer of such information to third parties without the consent of the holder is:

1) electronic communication;

2) dissemination of information;

3) provision of information;

4) confidentiality of information;

5) access to information.

42. Actions aimed at obtaining information from an undefined circle of persons or transmitting information to an undefined circle of persons are:

1) destruction of information;

2) dissemination of information;

3) provision of information;

4) confidentiality of information;

5) access to information.

43. The possibility of obtaining information and using it is:

1) preservation of information;

2) dissemination of information;

3) provision of information;

4) confidentiality of information;

5) access to information.

44. information transmitted or received by the user of the information and telecommunications network:

1) electronic communication;

2) an information message;

3) a text message;

4) visual communication;

5) SMS-message.

45. all components of the enterprise information system, in which personal data is accumulated and processed:

1) information system of personal data;

2) the database;

3) centralized data storage;

4) the system of the Statexpress;

5) the server.

46. Information of confidential nature, according to the decree of the President of the Russian Federation of March 6, 1997, includes:

1) information on the distribution of programs;

2) information on software licensing;

3) information posted in newspapers, the Internet;

4) personal data;

5) personal secret.

47. Methods of remote provision of medical care based on the use of modern information and telecommunication technologies is ...

1) telemedicine;

2) remote medical assistance;

3) videoconference;

4) video medication;

5) telemonitoring.

48. Many point-to-point communication, when the data of many patients are transferred to a consultative center, is organized in the framework of such telemedicine technology as ...

1) telemedicine consultation;

2) telemonitoring;

3) telemedicine meeting;

4) telemedicine lecture;

5) videoconference.

49. communication by the network scheme ("many points"), as a result of which all participants can communicate with each other, organized in the framework of such telemedicine technology as ...

1) telemedicine consultation;

2) telemonitoring;

3) telemedicine meeting;

4) telemedicine lecture;

5) remote medical assistance.

50. Point-to-multipoint communication, where a lecturer (teacher) can address all participants simultaneously, is organized within the framework of such telemedicine technology as ...

1) telemedicine consultation;

2) telemonitoring;

3) telemedicine meeting;

4) telemedicine lecture;

5) remote medical assistance.