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 BY"
«General medicine» educational program
Supervising person

Yu.S. Khotimchenko

« 14 » of January 2021

" APPROVED BY"
Clinical Medicine
Department Director

B.I. Geltser

« 14 » of January 2021

WORKING PROGRAM OF ACADEMIC DISCIPLINE (WPAD)

«Medical Informatics, Medical Statistics»
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 108 hours
including using ALM 12 hours
independent self-work 36 hours
including exam preparation is not provided
control works is not provided
credit at the 4 semester
exam is not provided

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 clinical medicine. Protocol No. 5, 14 of January 2021.

Author: Ostanin M.V.

Vladivostok 2021

Reverse side of the title page of the WPAD

I. The work program was revised at the meeting of the Department:
Protocol dated "_____" _____ 20___ No. _____
Department Director _____ _____
(signature) (Full Name)

II. The work program was revised at the meeting of the Department:
Protocol dated "_____" _____ 20___ No. _____
Department Director _____ _____
(signature) (Full Name)

III. The work program was revised at the meeting of the Department:
Protocol dated "_____" _____ 20___ No. _____
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IV. The work program was revised at the meeting of the Department:
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Department Director _____ _____
(signature) (Full Name)

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 72 hours, 2 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**	
UC-1.2 Be able to form value judgments in the professional field	**Know**	Knows the principles, criteria, rules for making judgments and assessments in the professional field
	Can	Able to form his own judgments and assessments, competently and logically arguing his point of view in the professional field.
	Master	Possesses the skills to apply theoretical knowledge to solving practical problems in the professional field
UK-4.6 Able to use modern information and communication tools and technologies)	**Know**	Knows modern information and communication means and technologies.
	Can	Able to use modern information and communication tools and technologies to solve standard communication and professional tasks
	Master	Possesses the skill of conducting business correspondence, receiving and processing information, using modern information and communication tools and technologies to solve standard communication and professional tasks
GPC-10.1. Able to use modern information and communication tools and technologies in professional activities	**Know**	Knows modern information and communication tools and technologies used in professional medical activities
	Can	Able to use modern information and communication tools and technologies in professional medical activities
	Master	Possesses the skill of using modern information and communication tools and technologies in professional medical activities
GPC K-10.2. Able to follow the rules of information security in professional activities	**Know**	Knows modern threats and rules for compliance with information security in professional activities
	Can	Able to work in a virtual information space in compliance with information security rules
	Master	Possesses the skill of safe work in the virtual information space
PC-17.2 Able to analyze medical and statistical indicators of morbidity, disability and mortality to assess	Know	medical and statistical indicators of morbidity, disability and mortality
	Can	analyze medical and statistical indicators of morbidity, disability and mortality to assess the health of the attached population

Code and formulation of competence.	**Stages of formation of competence**	
the health of the attached population	Master	skills in analyzing medical and statistical indicators of morbidity, disability and mortality to assess the health of the attached population
PC-19.1 Knows the rules for issuing medical records in medical organizations that provide medical care on an outpatient basis, including at home when a medical worker is called	Know	Knows medical documentation in medical organizations that provide outpatient medical care, including at home when calling a medical professional
	Can	He is able to draw up medical documentation under control in medical organizations that provide outpatient medical care, including at home when calling a medical worker
	Master	Has the skills of processing medical documentation in medical organizations that provide outpatient medical care, including at home when calling a medical worker
PC-19.2 Knows the rules of work in information systems and information and telecommunications network "Internet"	Know	Knows the information resources of the Internet.
	Can	Is able to work in the information environment of the Internet in compliance with the rules of information and antivirus security.
	Master	Has the skills of systematic work in the information environment of the Internet in compliance with the rules of information and antivirus security
PC - 19.3 Able to fill out medical documentation, including in electronic form	Know	Knows modern medical information systems for electronic document management.
	Can	Is able to use medical information systems of electronic document management to fill out medical documentation
	Master	Has the skill of using medical information systems of electronic document management to fill out medical documentation
PC-19.4 Knows how to use information systems and the information and telecommunications	Know	Knows modern medical professional information resources on the Internet.
	Can	Is able to receive reliable information in modern medical professional information resources on the Internet.
	Master	Has the skill of using modern medical professional information resources on the Internet to obtain reliable professional information.

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	UC-1.2 UK-4.6 GPC-10.1. GPC K-10.2 PC-17.2 PC-19.1 PC-19.2 PC - 19.3 PC-19.4	**Know**	Poll Test control Presentation	Question for exam 1-25
			Can	task	assignment
			Master	test	assignment
	Section 2. Analysis of data in medicine	UC-1.2 UK-4.6 GPC-10.1. GPC K-10.2 PC-17.2 PC-19.1 PC-19.2 PC - 19.3 PC-19.4	**Know**	Poll Test control Presentation	Question for exam 26-50
			Can	task	assignment
			Master	test	assignment
	Section 3. Information technologies in medicine	UC-1.2 UK-4.6 GPC-10.1. GPC K-10.2 PC-17.2 PC-19.1 PC-19.2 PC - 19.3	**Know**	Poll Test control Presentation	Question for exam 51-75
			Can	task	assignment

		PC-19.4	**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
Multimedia audience	Monoblock Lenovo C360G-i34164G500UDK; Projection screen

	Projecta 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

MINISTRY OF EDUCATION AND SCIENCE OF RUSSIAN FEDERATION
The Federal state autonomous educational institution
higher education
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(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
2021

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

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SCHOOL OF BIOMEDICINE

FUND OF ASSESSMENT TOOLS

on the subject "Medical Informatics. Mathematics"

Specialty 31.05.01 General Medicine
Full-time training

Vladivostok
2021

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**	
UC-1.2 Be able to form value judgments in the professional field	**Know**	Knows the principles, criteria, rules for making judgments and assessments in the professional field
	Can	Able to form his own judgments and assessments, competently and logically arguing his point of view in the professional field.
	Master	Possesses the skills to apply theoretical knowledge to solving practical problems in the professional field
UK-4.6 Able to use modern information and communication tools and technologies)	**Know**	Knows modern information and communication means and technologies.
	Can	Able to use modern information and communication tools and technologies to solve standard communication and professional tasks
	Master	Possesses the skill of conducting business correspondence, receiving and processing information, using modern information and communication tools and technologies to solve standard communication and professional tasks
GPC-10.1. Able to use modern information and communication tools and technologies in professional activities	**Know**	Knows modern information and communication tools and technologies used in professional medical activities
	Can	Able to use modern information and communication tools and technologies in professional medical activities
	Master	Possesses the skill of using modern information and communication tools and technologies in professional medical activities
GPC K-10.2. Able to follow the rules of information security in professional activities	**Know**	Knows modern threats and rules for compliance with information security in professional activities
	Can	Able to work in a virtual information space in compliance with information security rules
	Master	Possesses the skill of safe work in the virtual information space

Code and formulation of competence.	**Stages of formation of competence**	
PC-17.2 Able to analyze medical and statistical indicators of morbidity, disability and mortality to assess the health of the attached population	Know	medical and statistical indicators of morbidity, disability and mortality
	Can	analyze medical and statistical indicators of morbidity, disability and mortality to assess the health of the attached population
	Master	skills in analyzing medical and statistical indicators of morbidity, disability and mortality to assess the health of the attached population
PC-19.1 Knows the rules for issuing medical records in medical organizations that provide medical care on an outpatient basis, including at home when a medical worker is called	Know	Knows medical documentation in medical organizations that provide outpatient medical care, including at home when calling a medical professional
	Can	He is able to draw up medical documentation under control in medical organizations that provide outpatient medical care, including at home when calling a medical worker
	Master	Has the skills of processing medical documentation in medical organizations that provide outpatient medical care, including at home when calling a medical worker
PC-19.2 Knows the rules of work in information systems and information and telecommunications network "Internet"	Know	Knows the information resources of the Internet.
	Can	Is able to work in the information environment of the Internet in compliance with the rules of information and antivirus security.
	Master	Has the skills of systematic work in the information environment of the Internet in compliance with the rules of information and antivirus security
PC - 19.3 Able to fill out medical documentation, including in electronic form	Know	Knows modern medical information systems for electronic document management.
	Can	Is able to use medical information systems of electronic document management to fill out medical documentation

Code and formulation of competence.	**Stages of formation of competence**	
	Master	Has the skill of using medical information systems of electronic document management to fill out medical documentation
PC-19.4 Knows how to use information systems and the information and telecommunications	Know	Knows modern medical professional information resources on the Internet.
	Can	Is able to receive reliable information in modern medical professional information resources on the Internet.
	Master	Has the skill of using modern medical professional information resources on the Internet to obtain reliable professional information.

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	UC-1.2 UK-4.6 GPC-10.1. GPC K-10.2 PC-17.2 PC-19.1 PC-19.2 PC - 19.3 PC-19.4	**Know**	Poll Test control Presentation	Question for exam 1-25
			Can	task	assignment
			Master	test	assignment
	Section 2. Analysis of data in medicine	UC-1.2 UK-4.6 GPC-10.1. GPC K-10.2 PC-17.2 PC-19.1 PC-19.2 PC - 19.3 PC-19.4	**Know**	Poll Test control Presentation	Question for exam 26-50
			Can	task	assignment
			Master	test	assignment
	Section 3. Information technologies in medicine	UC-1.2 UK-4.6 GPC-10.1. GPC K-10.2 PC-17.2 PC-19.1 PC-19.2 PC - 19.3 PC-19.4	**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
UC-1.2 Be able to form value judgments in the professional field	Knows (entry level)	Knows the principles, criteria, rules for making judgments and assessments in the professional field	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)	Able to form his own judgments and assessments, competently and logically arguing his point of view in the professional field.	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)	Possesses the skills to apply theoretical knowledge to solving practical problems in the professional field	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
UK-4.6 Able to use modern information and communication tools and technologies)	Knows (entry level)	Knows modern information and communication means and technologies.	Knowledge of mathematical methods for solving intellectual problems and their application in	Formed structured systematic knowledge of mathematical methods for solving intellectual	65-71

			medicine;	problems and their application in medicine;	
	Can (advanced level)	Able to use modern information and communication tools and technologies to solve standard communication and professional tasks	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)	Possesses the skill of conducting business correspondence, receiving and processing information, using modern information and communication tools and technologies to solve standard communication and professional tasks	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-10.1. Able to use modern information and communication tools and technologies in professional activities	Knows (entry level)	Knows modern information and communication tools and technologies used in professional medical activities	Knowledge of the theoretical foundations of computer science, storage, search; processing, transformation, dissemination of	Formed structured systematic knowledge of the theoretical foundations of informatics, storage,	65-71

			information in medical and biological systems;	retrieval; processing, transformation, dissemination of information in medical and biological systems;	
	Can (advanced level)	Able to use modern information and communication tools and technologies in professional medical activities	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)	Possesses the skill of using modern information and communication tools and technologies in professional medical activities	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
GPC K-10.2. Able to follow the rules of information security in professional activities	Knows (entry level)	Knows modern threats and rules for compliance with information security in professional activities	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)	Able to work in a virtual information space in compliance with information security rules	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	71-84

				speak in public;	
	Master (high level)	Possesses the skill of safe work in the virtual information space	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
PC-17.2 Able to analyze medical and statistical indicators of morbidity, disability and mortality to assess the health of the attached population	Knows (entry level)	medical and statistical indicators of morbidity, disability and mortality	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)	analyze medical and statistical indicators of morbidity, disability and mortality to assess the health of the attached population	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)	skills in analyzing medical and statistical indicators of morbidity, disability and mortality to assess the health of the attached population	Skills of logical and reasoned analysis, public speech, discussion and polemics, editing of texts of professional content, implementation of educational and	Systematic application of the skills of logical and reasoned analysis, public speech, discussion and controversy, editing of texts of professional	85-100

			pedagogical activities	content, the implementation of educational and pedagogical activities	
PC-19.1 Knows the rules for issuing medical records in medical organizations that provide medical care on an outpatient basis, including at home when a medical worker is called	Knows (entry level)	Knows medical documentation in medical organizations that provide outpatient medical care, including at home when calling a medical professional	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)	He is able to draw up medical documentation under control in medical organizations that provide outpatient medical care, including at home when calling a medical worker	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)	Has the skills of processing medical documentation in medical organizations that provide outpatient medical care, including at home when calling a medical worker	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

PC-19.2 Knows the rules of work in information systems and information and telecommunications network "Internet"	Knows (entry level)	Knows the information resources of the Internet.	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)	Is able to work in the information environment of the Internet in compliance with the rules of information and antivirus security.	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)	Has the skills of systematic work in the information environment of the Internet in compliance with the rules of information and antivirus security	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
PC - 19.3 Able to fill out medical documentation, including in electronic form	Knows (entry level)	Knows modern medical information systems for electronic document management.	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)	Is able to use medical information systems of electronic document management to fill out medical documentation	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)	Has the skill of using medical information systems of electronic document management to fill out medical documentation	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
PC-19.4 Knows how to use information systems and the information and telecommunications	Knows (entry level)	Knows modern medical professional information resources on the Internet.	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)	Is able to receive reliable information in modern medical professional information resources on the Internet.	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	71-84

				speak in public;	
	Master (high level)	Has the skill of using modern medical professional information resources on the Internet to obtain reliable professional information.	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

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

Assessment tools for ongoing appraisal

The current certification of students in the discipline "Medical Informatics, Medical Statistics" is carried out in accordance with the local regulations of FEFU and is mandatory.

Current certification in the discipline "Medical Informatics, Medical Statistics" is carried out in the form of testing and is carried out by a leading teacher.

Typical test tasks

(specify the number of one correct answer)

1. What is a population?

a. Part of the whole
b. All objects of the studied category+
c. The size of the characteristic of the object

2. What is sampling?

a. The magnitude of the feature of the object
b. Trait Evaluation Indicator
c. Part of the general population+

3. What indicators of variability do you know?

a. fashion
b. median
c. limits, standard deviation, coefficient of variation+

4. What determines the variant (date) in statistics?

a. The numeric value of the characteristic size of the + object
b. Distance between objects
c. The rate of evolution in biology

5.What is regression?

a. change in hereditary material
b. partial return of offspring to the average level for the population+
c. variability of the characteristics of the group of the organism

6. What factor determines the correlation?

a. Independent chromosome divergence in meiosis
b. The relationship between the signs+
c. Alteration of genetic material

7. Indicate the degree of relationship between the signs?

a. positive, negative
b. direct, reverse
c. Strong, Medium, Weak+

8. What constants of the variation series are considered basic?

a. Heritability and repeatability coefficients
b. arithmetic mean, square deviation, stat. Bugs+
c. correlation and regression coefficients.

9. How to establish the reliability of the results of a statistical error?

a. If the parameter > its error by 3 times or more, then it is reliable+
b. the number of errors in the recombination of genetic material
c. method of heteroploidy

10. Absolute growth is:

A. Percentage of absolute increase to previous level

b. the difference between the level of this year and the previous one+

11. The growth rate is:

a. percentage of absolute increase to the previous level +

b. the difference between the level of this year and the previous one

12. What is a variation series?

a. the volume of observation units is not more than 30

b. a series of numerical values of the trait under study, arranged in a certain

order+

c. the relationship between phenomena, which does not manifest itself in each specific case, but in mass comparison

13. Morbidity is:

a. a set of new, not registered anywhere, not recorded, for the first time in a given year detected

b. the totality of all existing diseases first identified both this year and in previous years, but for which patients have applied again in this year+

c. the totality of all existing diseases first detected by medical examinations

14. Which filename extension corresponds to a document created in Excel spreadsheets

a. . xcs

b. . .exe

c. .exl+

d. .doc

15. What determines the address of a cell in an Excel table?

a. the digits of the column name and the letters of the row designation at the intersection of which this cell is located

b. the letters of the column name and the numbers of the row designation at the intersection of which this cell is located+

c. the letters of the column name and the worksheet number of the spreadsheet;

D. Digits of the String Designation and File Name of the Spreadsheet

16. How can I remove the "Virus" malware?

a. Restart the computer

b. Turning off the computer from the electrical outlet

c. with the help of special programs+

d. Mechanically.

17. How are Excel spreadsheets organized?

A. They are a workbook that can consist of multiple worksheets+

b. they are a white field

c. they are a collection of diagrams

18. What data can Excel table cells contain?

A. Numeric

B. Text

c. Formulas

d. All of the above+

19. Is it technical support?

A. These are computers

b. a set of technical means intended for the operation of the information system, as well as the relevant documentation for these means and technological processes +

c) this software

20.What is standard deviation?

A. Confidence interval

B. Characterization of the diversity of the trait

C. Characteristics of the sample as a whole

20. Is "Mednet"?

a. telecommunication medical network of Russia+

B. Automated monitoring of public health

c. Automated control system

D. Automated workplace

21. Is automated screening?

A. Telecommunication network

B. Automated Targeted Health Check-up+

c. Automated workplace of the district pediatrician

D. Automated control system

21.The sample population in relation to the general should be

A. Medium

b. representative+

c. Group

d. Relative

22. The following statistical methods shall be used in the practice of the doctor:

A. Graphic

B. Sociological

C. Calculation of intensive quantities

D. All of the Above+

23. Options are:

A. Numeric expression of the feature+

B. Average value

c. Relative indicator

d. Absolute magnitude

24.The criteria for the diversity of a trait are:

A. Amplitude

B. Standard deviation

C. Coefficient of variation

D. All of the Above+

25. Statistics as a science studies:

A. Single phenomena

B. Mass phenomena+

C. Recurring Events

26.Statistics studies phenomena and processes by studying:

a. certain information
b. Statistical indicators+
c. signs of various phenomena

27. The distribution range is:

a. Ordered arrangement of units of the studied population by groups +
b. a series of indicator values arranged randomly

28. The values of the feature that are repeated with the greatest frequency are called

A. Fashion+
b. Median

29. What is meant in statistics by the term "variation of the indicator"?

A. Change in the value of the indicator+
B. Change of the name of the indicator
C. Change in the dimensionality of the indicator

30. Standard deviation characterizes

A. Data Relationship
B. Data Spread+
C. Data Dynamics

Test Evaluation Criteria

Assessment is carried out in an e-learning session on a hundred-point scale.

The test contains 100 tasks, the maximum score on the test is 100 points.

Within the framework of the current level of assimilation of knowledge in the discipline, a test result of at least 61 points is allowed.

Evaluation tools for intermediate certification

Intermediate certification of students in the discipline "Medical Informatics, Medical Statistics" is carried out in accordance with the local regulations of FEFU and is mandatory.

Depending on the type of intermediate control in the discipline and the form of its organization, various criteria for assessing knowledge, skills and abilities can be used.

Intermediate certification in the discipline "Medical Informatics, Medical Statistics" is carried out in the form of a test in the form of a written answer.

Exam Questions

1. The subject of statistics.

2. The concept of the statistical method.

3. The concept of statistical observation.

4. Stages, forms, types and methods of statistical observation.

5. Classification and grouping as a method of processing and analysis of primary statistical information.

6. Basic techniques for building and performing grouping.

7. Types of groupings. Statistical table.

8. The concept of absolute indicator. Types of absolute indicators.

9. Relative indicators. Their role and typology.

10. The concept of average. Scope of mean values in statistical research.

11. Types of average values and methods for their calculation.

12. Structural characteristics of the sample population. Fashion and median.

13. Mean power characteristics of the sample population.

14. The concept of variation. Sampling scope.

15. The concept of variation. Mean linear deviation.

16. The concept of variation. Dispersion.

17. Variance and standard deviation.

18. Coefficient of variation.

19. The essence of the correlation.

20. The essence of the main components.

21. Pearson's linear correlation coefficient.

22. Spearman's rank correlation coefficient.

23. The concept of selective observation. Types of sampling. Methods of sampling.

24. The concept of data in the general population. Methods for extending sample observation to the general population.

25. Statistical graphs and charts.

26. Basic concepts of regression analysis. Pairwise linear regression.

Criteria for grading a student on an exam / test

in the discipline "Medical Informatics, Medical Statistics"

Exam Assessment	Requirements for formed competencies
"Excellent"	An "excellent" grade is given to a student if he has deeply and firmly mastered the program material, exhaustively, consistently, clearly and logically coherently sets it out, knows how to closely link theory with practice, freely copes with tasks, questions and other types of application of knowledge, and does not find it difficult to answer when modifying tasks, uses monographic literature in the answer, correctly justifies the decision made, possesses versatile skills and methods of implementation practical tasks;
"Good"	A "good" grade is given to a student if he firmly knows the material, competently and essentially presents it, avoiding significant inaccuracies in the answer to the question, correctly applies theoretical positions in solving practical issues and tasks, has the necessary skills and techniques for their implementation;
"satisfactory"	A "satisfactory" grade is given to a student if he has knowledge of only the basic material, but has not mastered its details, makes inaccuracies, insufficiently correct formulations, violations of the logical sequence in the presentation of the program material, has difficulties in performing practical work;
'Unsatisfactory'	An "unsatisfactory" grade is given to a student who does not know a significant part of the program material, makes significant mistakes, and performs practical work with great difficulty.