
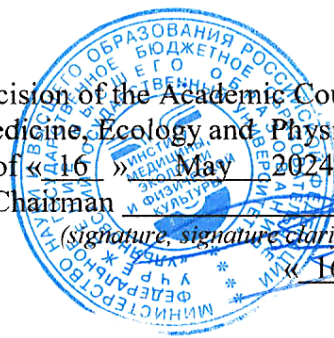


Ministry of Science and Higher Education of the Russian Federation Ulyanovsk State University	Form	
F - Working program on discipline " MODERN MEDICAL INFORMATION SYSTEMS"		

**APPROVED**  
by the decision of the Academic Council of the Institute  
of Medicine, Ecology and Physical Culture of USU  
of «16» May 2024, Record No. 9/260  
Chairman V. V. Mashin  
(signature, signature clarification)  
«16» May 2024



### WORKING PROGRAM

Discipline	MODERN MEDICAL INFORMATION SYSTEMS Б1.В. ДВ.05.02
Faculty	Faculty of medicine T. Z. Biktimirova
Department	General and Clinical Morphology
Course	3

Field (speciality) 31.05.01 General medicine  
*course code (speciality), full name*

Orientation (profile / specialization) \_\_\_\_\_  
*full name*

Form of study intramural  
*intramural, extramural, intra-extramural (specify only those that are implemented)*

Date of introduction in the teaching process at USU: « 01 » september 2024

The program was updated at the department session: protocol № \_\_\_\_\_ of \_\_\_\_\_ 20\_\_ .

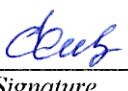
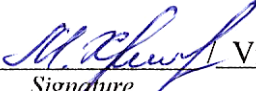
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The program was updated at the department session: protocol № \_\_\_\_\_ of \_\_\_\_\_ 20\_\_ .

The program was updated at the department session: protocol № \_\_\_\_\_ of \_\_\_\_\_ 20\_\_ .

**Information on authors:**

Initials	Department	Degree, title
Zerkalova J.F.	General and Clinical Morphology	Candidate of Medical Sciences, assistant professor
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AGREED	AGREED
Head of the Department of General and Clinical Morphology, implementing the discipline	Head of the Graduating Department of Hospital Therapy
 / <u>Slesareva E.V.</u> / <i>Signature</i> <i>Initials</i>	 / <u>Vize-Khripunova M. A.</u> / <i>Signature</i> <i>Initials</i>
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## 1. OBJECTIVES AND AIMS OF MASTERING THE DISCIPLINE

### Objectives of mastering the discipline:

The purpose of the discipline development is to form students' knowledge about the essence and significance of health Informatization in General, modern information technologies for providing medical and diagnostic process, management in Healthcare Service and biomedical research.

The process of mastering the discipline "Modern medical information systems." is aimed at the formation of universal and professional competencies (UC-4, PC-6).

### Aims of mastering the discipline:

- to form students' knowledge about the use of modern information technologies in medicine, medical science and healthcare;
- study the overall structure, software and hardware for obtaining, entering, storing, searching, processing and analyzing biomedical information and its protection;
- give students information about the types and classification of modern information systems and technologies.
- to give knowledge about the rules of implementation and use used in the treatment and diagnostic process of modern information and telemedicine systems;
- teach students to use modern information and telemedicine systems to process biomedical information.

## 2. PLACE OF DISCIPLINE IN THE STRUCTURE OF THE BASIC PROFESSIONAL EDUCATIONAL PROGRAM: the discipline Б1.В1.ДВ.05.02

Discipline Б1.В1.ДВ.05.02 "Modern medical information system" refers to basic part of the basic professional educational program (BPEP) specialty 31.05.01 General medicine.

Mastering the discipline is based on the knowledge, skills and abilities formed by previous disciplines:

- Foreign language (Russian)
- Psychology and pedagogy
- Russian language and speech culture
- Psychology and pedagogy of medical activity
- Immunology
- Project activity
- The basics of rational nutrition
- Public health and healthcare

The results of mastering the discipline will be necessary for the further learning process in the framework of the gradual formation of competencies in the study of the following special disciplines:

- Marketing in healthcare
- Organization of drug supply to the population
- Practice for obtaining primary professional skills and skills of an outpatient clinic doctor
- Assistant doctor of an outpatient clinic
- Epidemiology
- Quality management of medical care

### 3. LIST OF PLANNED LEARNING OUTCOMES ON DISCIPLINE, CORRELATED WITH THE PLANNED RESULTS OF MASTERING THE BASIC PROFESSIONAL EDUCATIONAL PROGRAM

Name of the category (group) of universal competencies	The code and name of the universal competence	Code and name of the indicator (indicators) of achieving universal competence
Communication	<p><b>UC-4</b> Is able to apply modern communication technologies, including in a foreign language (s), for academic and professional interaction</p>	<p><b>IA-1uc4</b> Know the rules and patterns of personal and business oral and written communication</p> <p><b>IA-2uc4</b> Be able to apply in practice communication technologies, methods and methods of business communication for academic and professional interaction</p> <p><b>IA-3uc4</b> Master the methodology of interpersonal business communication in Russian and foreign languages with the use of language forms, means and modern communication technologies</p>

Name of the category (group) of professional competencies	Code and name of the professional competence	Code and name of the indi- cator (indicators) of achiev- ing professional competence
Maintaining medical records and organizing the activities of the secondary medical personnel at the disposal	<p><b>PC-6</b> Ability to apply the basic principles of organization and management in the field of public health protection, in the medical organizations and their structural divisions</p>	<p><b>To know:</b> the state policy in the field of public health protection; the basics of organizing medical care for the population; the basics of management, planning, financing of medical organizations and their structural divisions.</p> <p><b>Be able to:</b> apply the basic principles of organization and management in the field of public health protection, in medical organizations and their structural divisions.</p>

	<b>Possess:</b> methods for calculating and analyzing the performance indicators of medical organizations.
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#### 4. TOTAL WORKLOAD OF THE DISCIPLINE

4.1. Volume of discipline in credit units (total) 72 hours (2Credit)

4.2. Volume discipline by type of study (in hours)

Type of academic workload	Number of hours (Form of study: intramural )			
	Total in the plan	Hours per term		
		term № 6		
1	2	3	4	5
Contact work of students with the Lecturer in accordance with the EP	<b>34</b>	<b>34</b>	-	-
Classroom	34	34	-	-
Lectures	17	17	-	-
Seminars and practical's	17	17	-	-
Laboratory and work practical's	-	-	-	-
Individual work	<b>38</b>	<b>38</b>	-	-
The form of the current control of knowledge and control of independent work	Quiz Interview	Quiz Interview	-	-
Term paper	-	-	-	-
Types of interim attestation (exam, credit(test))	a credit	a credit	-	-
Total hours in discipline	<b>72</b> <b>(2credit units)</b>	<b>72</b> <b>(2 credit units)</b>	-	-


\* If it is necessary to use partially/exclusively distance learning technologies in the educational process, the number of hours of teaching staff working with students for conducting classes in a distance format using e-learning is indicated in the table using a slash.

4.3. The contents of discipline (module). Distribution of hours on the themes and types of academic work: number of hours- 72

Form of study: intramural

Units / Themes of discipline	Total labor intensity (in hours)	Types of training sessions					Forms of the progress monitoring
		Classroom			Classes in an interactive form	Individual work	
		Lectures	Seminars and practical's	Laboratory and work practical's			
1	2	3	4	5	6	7	8
<b>Section 1. INTRODUCTION</b>							
1.1. Introduction to the course "Modern medical information systems and tele-medicine".	4	1	1			2	Quiz, Interview
1.2. The concept of creating a unified state information system in the field of health of the Ministry of Health of the Russian Federation.	4	1	1			2	Quiz, Interview
1.3. The concept of creating a unified state information system in the field of health of the Ministry of Health of the Russian Federation.	4	1	1			2	Quiz, Interview
<b>Section 2. INFORMATION SYSTEMS IN MEDICINE</b>							
2.1. Basic terms in the field of IT use in healthcare.	4	1	1			2	Quiz, Interview
2.2. Standardization of structure of electronic medical data.	4	1	1			2	Quiz, Interview
2.3. General principles of information security in medical information systems.	4	1	1			2	Quiz, Interview
2.4. Electronic	4	1	1			2	Quiz, Inter-

medical history. Standards, requirements, and structure.							view
2.5. Electronic medical history. Standards, requirements, and structure.	4	1	1			2	Quiz, Interview
2.6. Universal clinical medical and information systems.	4	1	1			2	Quiz, Interview
2.7. Medical information systems of health management.	5	1	1			3	Quiz, Interview
2.8. Special medical information systems.	5	1	1			3	Quiz, Interview
2.9. Reference medical information systems.	4	1	1			2	Quiz, Interview
2.10. Criteria for assessing the reliability of medical Internet information.	4	1	1			2	Quiz, Interview
<b>Section 3. TELEMEDICINE</b>							
3.1. Principles of organization, goals and objectives of the telemedicine system in Russia and abroad.	5	1	1			3	Quiz, Interview
3.2. Legal and economic bases of telemedicine activity							Quiz, Interview
3.3. Organization of work, personnel and documentation of telemedicine centers.	5	1	1			3	Quiz, Interview
3.4. Equipment of telemedicine centers.	4	1	1			2	Quiz, Interview
3.5. The main	4	1	1			2	Quiz, Inter-

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types of telemedicine activities.							view
<b>TOTAL:</b>	<b>72</b>	<b>17</b>	<b>17</b>			<b>38</b>	

## 5. CONTENT OF THE DISCIPLINE

### Section 1. Introduction

#### Unit 1.1. Introduction to the course " Modern medical information systems. Telemedicine in the professional activity of a doctor".

- 1.Goals of healthcare Informatics. Social significance and economic effects of Informatization of medicine. The concept of e-health. Programs of Informatization of the USA, Great Britain, Canada.
- 2.Informatization of health care system in Russia. Federal registers and normative reference information support of the health care system. Personalized accounting of medical care.
- 3.Information support of treatment and diagnostic process and provision of highly technical and logical medical care. Monitoring, planning and management of the health care industry through information systems.

#### Unit 1.2. The concept creating of Uniform State Health Information System

- 1.Prerequisites for the creation of State\_Information System of Health Care (SISHC).
- 2.The purpose and principles of the SISHC (EGIS). The main functions of the SISHC.
- 3.The General architecture of SISHC, its segments, system infrastructure and interaction between components.

#### Unit 1.3. The concept creating of State\_Information System of Health Care of the Ministry of health of the Russian Federation.

- 1.Federal data processing center (DPC) of the Ministry of health.
- 2.Basic principles of methodology of creation, implementation, support and development of the system. The main stages of the implementation of the SISHC.
- 3.Resource support for the creation and support of the system.

### Section 2. Information systems in medicine

#### Unit 2.1. Key terms in the use of health care.

- 1.Common problems in the definition of key terms in the field of Health Informatization.
- 2.The concept of " Electronic health record". Key terms and concepts, Electronic medical record (EMR). EMR domain model. Electronic Health Record. Electronic document. Electronic medical archives (Electronic Health Record).


#### Unit 2.2. Standardization of Electronic medical data structure.

- 1.Medical data processing processes. Structure of electronic medical records.
- 2.Architecture of EMR. Electronic extract from medical records. CMR (Continuing medical records) standard.

#### Unit 2.3. General principles of information security in Medical Information Systems.

- 1.The main legal and regulatory acts regulating the requirements for the processing of personal data (PD).
2. Definition of PD. Operators PD. Po-row registration of PD operators and the register of PD operators. The concept of PD in the health care system. The PD subjects. Consent and disagreement to



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provide PD, the order, procedure and registration of consent to provide PD. Ensuring the protection of PD in the implementation of information systems in the work of health care institutions.

#### **Unit 2.4. Electronic medical history. Standards, requirements and structure.**

1. Electronic medical documentation. The concept of electronic medical history.
2. Russian National Standard " Electronic medical history. Generalities. GOST R 52636-2006". Optimal electronic medical history (EMH). The order of registration and the main sections.
3. Structure: text, visual and audio applications, dynamic videos.

#### **Unit 2.5. Electronic medical history. Standards, requirements and structure.**

1. The contents of the electronic medical history and applications for their processing. The creation of applications.
2. Basic requirements for the transmission of data on x-ray, functional, ultrasound, morphological studies.
3. Dynamic videos: examination of the patient, recording of ultrasound, invasive manipulation, surgery.

#### **Unit 2.6. Universal clinical medical information systems.**

1. Classification of medical information systems. Structure (building blocks) multi-purpose clinical information systems.
2. Position interface of MIS. Editing tools and setting up access to information. Interaction of MIS with external data storage devices. Structure of information transmission networks in healthcare.

#### **Unit 2.7. Medical information management systems of health care.**

1. General principles of implementation and operation of medical information systems.
2. Medical Center for Information and Analysis. Aims and objectives Medical Center for Information and Analysis (MCIA) for the management of regional health systems.
3. The structure of the MCIA. The main directions (components) of work on the implementation of MCIA. Factors limiting the implementation of MCIA. Adaptation of IIAs to specific institutions. Assessment of MCIA implementation results.

#### **Unit 2.8. Special medical information systems.**

1. MIS ambulance service. Features of the organization of information support of service of medicine of catastrophes.
2. MIS of blood transfusion and procurement services and blood preparations. MIS forensic medicine and Transplantology. Expert decision support systems.
3. Medical information pharmaceutical systems of pharmacies and drug supply services.


#### **Unit 2.9. Reference medical information systems.**

1. Types of reference information systems. Register of medicines of Russia and its electronic version.
2. Internet Smith. Website of the medical institution, its structure, data organization, interface.
3. Interactive services of websites of medical institutions. Medical Advisory sites.

#### **Unit 2.10 Criteria for Assessing the Quality of Health Information on the Internet.**

1. Medical information on the Internet. Health On the Net Foundation (HON).
2. International cooperation of the Foundation. Certification of medical sites. Database HON-code. Search capabilities and technology HON.
3. Prospects for the development of certification and assessment of the quality and reliability of information on medical web sites.



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### Section 3. Telemedicine

#### Unit 3.1. Principles of organization, goals and objectives of the telemedicine system of Russia and foreign countries.

- 1.The order of Ministry of health of the Russian Federation N 344, RAMS N 76 of 27.08.2001 "about the statement of the Concept of development of telemedicine technologies in the Russian Federation and the plan of its implementation"
- 2.Directions of telemedicine development. Principles of telemedicine networks. Levels of organization of telemedicine system — Federal, district, regional, district. Telemedicine centers as an organizational link of telemedicine networks. The main functions of telemedicine centers.

#### Unit 3.2. Legal and economic bases of telemedicine activity.

- 1.Legal and regulatory framework of telemedicine. Organizational and legal forms of creation of telemedicine centers. The concept of telemedicine services, types of telemedicine services.
- 2.Entities operating in the telemedicine market: Basic legal documents on telemedicine. Contract with the patient for telemedicine consultation. Voluntary informed consent for telemedicine consultation Information and advertising support of telemedicine.

#### Unit 3.3. Organization of work, personnel and documentation of telemedicine centres.

- 1.Organization of the center: planning, coordination, control and correction of activities in accordance with the main (statutory) goals and current tasks. Functional duties of employees.
- 2.Documentation of telemedicine centers of the center, their forms and contents.

#### Unit 3.4. Equipment of telemedicine centers.

- 1.The equipment intended for input, transformation and exchange of e-mail, systems of video conferences or other software applications on communication channels the Main hardware and technological elements of a telemedicine complex.
- 2.Program support of the complex.

#### Unit 3.5. The main types of telemedicine activities.

- 1.Activities of telemedicine centers: Clinical and Advisory, Educational, Organizational and Methodological, Information and Telecommunications, Research, Financial and Economic.

## 6. TOPICS OF PRACTICAL CLASSES (FOR DISCUSSING AND INDIVIDUAL WORK OF STUDENTS)

### Section 1. Introduction


#### Unit 1.1. Introduction to the course " Modern medical information systems. Telemedicine in the professional activity of a doctor".

Questions to unit:

- 1) What are the goals of health Informatization?
- 2) Determine the social significance and economic effects of Informatization of medicine.
- 3) Formulate the concept of e-health.

#### Unit 1.2. The concept creating of Uniform State Health Information System.

Questions to topic:

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- 1) What prerequisites contributed to the creation of a unified state information system SISHC (EGIS) in health care?
- 2) What are the goals and principles of the SISHC (EGIS)?
- 3) List the main functions of the SISHC (EGIS)?
- 4) What is the overall architecture of the SISHC (EGIS), its segments, system infrastructure and interaction between components?

### **Unit 1.3. The concept of creating a unified state information system in the field of health of the Ministry of health of the Russian Federation.**

Questions to topic:

- 1) What is the Federal data processing center (DPC) of the Ministry of health?
- 2) What are the basic principles of the methodology for the creation and implementation of the unified state SYSTEM?
- 3) List and briefly describe the main stages of implementation of the creation of the unified state SYSTEM.
- 4) What is the resource support for the creation and support of the SISHC (EGIS)?

## **Section 2. Information systems in medicine**

### **Unit 2.1. Key terms in the use of it in health care.**

Questions to topic:


- 1) What are the common challenges in defining key terms in health Informatization?
- 2) Formulate the concept of " Electronic medical history."
- 3) Define the term "Electronic medical record (EMR)»
- 4) What is the model of the subject area of EMR?
- 5) Define the term "Electronic records".
- 6) Define the term "Electronic documents".
- 7) Define the term "Electronic medical archives".

### **Unit 2.2. Standardization of electronic medical data structure.**

Questions to topic:

- 1) What are the main processes of medical data processing known?
- 2) What is the structure of electronic medical records?
- 3) What is the architecture of EMR?
- 4) The Main blocks of electronic statements from medical records.
- 5) Describe the CMR (Continuing medical records) standard.

### **Unit 2.3. General principles of information security in medical information systems.**

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Questions to topic:

- 1) List the main legal and regulatory acts regulating the requirements for the processes of personal data processing (PD).
- 2) Define the concept of "personal data" - PD.
- 3) What is meant by the operator PD?
- 4) What is the procedure for registration of PD operators and the register of PD operators?
- 5) Formulate the concept of PD in the health care system.
- 6) Give the definition of the term "subject PD".
- 7) What is the order, procedure and registration of consent to provide PD?
- 8) What are the measures to ensure the protection of PD in the implementation of information systems in the work of health care institutions?

#### **Unit 2.4. Electronic medical history. Standards, requirements and structure.**

Questions to topic:

- 1) List the types and briefly describe the types of electronic medical documentation.
- 2) Formulate the definition of " electronic medical history."
- 3) What is the content of the "National standard "Electronic medical history. General provisions. GOST R 52636-2006"?
- 4) What is the best option EMH.
- 5) What is the procedure for registration and the main sections of the EMH?
- 6) What is the structure of EMH?

#### **Unit 2.5. Electronic medical history. Standards, requirements and structure.**


Questions to topic:

- 1) What is the content of the electronic medical history and applications for its processing?
- 2) What are the main requirements for the transmission of data on x-ray, functional, ultrasound, morphological studies?
- 3) What dynamic videos are used in EMH?

#### **Unit 2.6. Universal clinical medical information systems.**

Questions to the topic:

- 1) Give the classification of medical information systems.
- 2) List the units of structure (building blocks) multi-purpose clinical information systems.
- 3) What should be the interface jobs MIS?
- 4) What editing tools and setting up access to information should be in the MIS interfaces?
- 5) How do MIS interact with external storage devices?

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6) What is the structure of health information networks?

### **Unit 2.7. Medical information management systems of health.**

Questions to topic:

- 1) List the General principles of the organization of implementation and operation of medical information systems?
- 2) Describe the purpose of medical information and analytical centers (MIAC) and their goals and objectives for the management of regional health systems.
- 3) What is the structure of MIAC?
- 4) What are the requirements for IIAs?
- 5) What are the main directions (components) of work on the implementation of MIS? Factors limiting the implementation of IIAs. Adaptation of MIS to specific institutions. Assessment of MIS implementation results.

### **Unit 2.8. Special medical information systems.**

Questions to topic:

- 1) What is the specifics of the MIS ambulance service?
- 2) What are the features of the organization of information support of the disaster medicine service?
- 3) What are the features of MIS services of transfusion and procurement of blood and blood products?
- 4) What are the specifics of MIS forensic medicine and transplantation?
- 5) What are the specifics of expert decision support systems?
- 6) What are the specifics of medical information pharmaceutical systems of pharmacies and drug supply services?

### **Unit 2.9. Reference medical information systems.**


Questions to topic:

- 1) List the types of reference information systems.
- 2) Describe the electronic version of the register of medicines of Russia.
- 3) What should be the website of the medical institution, its structure, data organization and interface?
- 4) What interactive services should the websites of medical institutions contain?
- 5) What is the specificity of medical Advisory sites?

### **Unit 2.10. Criteria for assessing the reliability of medical Internet information.**

Questions to topic:

- 1) What is the overall quality of medical information on the Internet according to the data.international the Net Foundation (HON)?

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- 2) How and for what was created the the Net Foundation (HON)?
- 3) What are the directions of the international cooperation Fund?
- 4) What is the system of certification of medical websites?
- 5) What is the HON-code database?
- 6) What are the prospects for the development of certification and evaluation of the quality and reliability of information on medical web sites?

### **Section 3. Telemedicine**

#### **Unit 3.1. Principles of organization, goals and objectives of the telemedicine system of Russia and foreign countries.**

Questions to topic:

- 1) Describe briefly the history and content of the " Concept of development telemedicine technologies in the Russian Federation.
- 2) What are the main directions of telemedicine development in Russia?
- 3) What are the principles of telemedicine networks?
- 4) What are the known levels of organization of the telemedicine system?
- 5) Describe telemedicine centers as the organizing link of telemedicine networks.
- 6) List the main functions of telemedicine centers.

#### **Unit 3.2. Legal and economic bases of telemedicine activity.**


Questions to topic:

- 1) What is the current legal framework for telemedicine?
- 2) What are the known organizational and legal forms of telemedicine centers?
- 3) Define the concept of telemedicine service.
- 4) What types of telemedicine services are available?
- 5) List the main legal documents on telemedicine.

#### **Unit 3.3. Organization of work, personnel and documentation of telemedicine centers.**

Questions to topic:

- 1) How organized the work of the model telemedicine center (TMC)?
- 2) List the types of work typical goods and materials.
- 3) What is the composition of the staff of a typical TMC?
- 4) What are the responsibilities of employees of a typical TIC?
- 5) List the basic documentation of the telemedicine center, their forms and

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content.

### **Unit 3.4. Equipment of telemedicine centers.**

Questions to topic:

- 1) List the list of equipment intended for input, conversion and exchange of typical goods and materials.
- 2) List the equipment of the video conferencing system and software applications communication channels typical goods and materials.
- 3) What are the main hardware and technology elements of telemedicine complex?
- 4) What is the software of a typical TMC?

### **Unit 3.5. The main types of telemedicine activities.**

Questions to topic:


- 1) List the activities of telemedicine centers.
- 2) What is the Clinical and Advisory activities of the typical TMC?
- 3) What is the educational and organizational and methodological activities of the typical TMC?
- 4) What is the educational, information and telecommunication and research work of a typical TMC?

## **7. LABORATORY AND WORK PRACTICAL'S**

This type of work is not provided

## **8. SUBJECTS OF COURSE, TEST PAPERS AND ABSTRACTS**

1. History of telemedicine.
2. Modern telemedicine projects in Russia.
3. Clinical, educational, managerial, informational, analytical and investigative aspects of telemedicine.
4. Experience of the regional telemedicine center.
5. Activities of the telemedicine center.
6. The structure of the telemedicine center.
7. Strategy of telemedicine network development in the region.
8. Typical errors in the introduction and transmission of telemedicine information.
9. Standardization of equipment and technologies in the telemedicine center.
10. Standardization issues in telemedicine.
11. Telemedicine consultations: goals, forms, types, limits of applicability.
12. Electronic medical history in telemedicine: form and content.
13. Information work with the medical community.
14. Promotion of telemedicine in the media.
15. Glossary of telemedicine.
16. The problem of quality control in telemedicine.
17. IP Protocol capabilities for video conferencing.


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18. Compatibility problems in telemedicine.
19. Cost of telemedicine services.
20. Cost-effectiveness of telemedicine consultations.
21. Marketing of telemedicine services.
22. Advertising telemedicine services.
23. Telemedicine center website.
24. Equipment telemedicine room.
25. Mobile complex of telemedicine consultations.
26. Minimum set of equipment for telemedicine.
27. IP protocols-video conferencing capabilities.
28. Comparative analysis of different image input technologies.
29. Types of video input (equipment, classification).
30. Issues of preserving the quality of information in telemedicine

### 9. LIST OF QUESTIONS FOR A CREDIT

№	Question
1.	Purpose healthcare Informatics. Social significance and economic effects of Informatization of medicine. The concept of e-health.
2.	The main goals, directions and features of Informatization of the health care system in Russia
3.	Structure and content "The concept creating of Uniform State Health Information System" of the Ministry of health of the Russian Federation»
4.	Common problems in defining key terms in health Informatization. The concept of electronic medical document.
5.	The main legal and regulatory acts regulating the requirements of the production process personal data (PD).
6.	The protection of security of personal data (PD) in the implementation of information systems in the work of health care institutions.
7.	The concept of electronic medical history. National standard "Electronic medical history".
8.	The contents of the electronic medical history and applications for their processing.
9.	Classification of medical information systems. Structure (building blocks) multi-purpose clinical information systems.
10.	General principles of implementation and operation of medical information systems
11.	Medical information and analytical centers. Aims and objectives of MIAC for the management of regional health systems
12.	Expert decision support systems.
13.	Medical information pharmaceutical systems of pharmacies and drug supply services
14.	Information support of medical diagnostic equipment. Basic principles of graphic data recognition programs in biopotential recording devices.
15.	Programs for recognition of x-ray images, computer x-ray (CT) and computer magnetic resonance imaging (MRI) data.
16.	Computer analysis of microscopic images.
17.	Website of the medical institution, its structure, data organization, interface
18.	Interactive services of websites of medical institutions.
19.	Types of reference information systems. Register of medicines of Russia and its electronic version



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20.	Medical Advisory Internet sites.
21.	Internet educational resources for pre-and post-graduate training of medical specialists.
22.	Professional medical websites of public and non-governmental organizations and associations of medical specialists.
23.	Electronic medical libraries and organized databases of scientific medical data
24.	Telemedicine as a technology. The main directions of development, principles of construction and levels of organization of telemedicine systems.
25.	The main functions of telemedicine centers.
26.	The concept of telemedicine service. The main legal documents on telemedicine
27.	Equipment designed for input, conversion and exchange of e-mail, video conferencing systems or other software applications over communication channels.
28.	General principles of assessment of reliability of medical information of information systems in health care.
29.	General principles of evaluation of socio-economic efficiency of information systems in health care.
30.	Activities of telemedicine centers.


## 10. INDIVIDUAL WORK.

Form of study intramural

Units / Themes of discipline	Type of individual work (study of educational material, problem solving, essay, report, examination, preparation for the exam, etc.)	Hours	Form of control (checking the solution of problems, abstract, etc.)
1.2.2. The concept of creating a unified state information system in the field of health of the Ministry of health and social development of the Russian Federation.	Individual work on the subject provides for an independent search on the official web-site of the Ministry of health and an independent study of the text of the "concept of creating a unified state information system in the health sector (order of the Ministry of health and social development of the Russian Federation No. 364 of 28 April 2011)" the formulation of the basic concept-rd and terms of a document, abstracting the document structure and content of the main sections. In the process of independent work, the student must master the skills of working with legal documents to obtain the appropriate professional competence in the information support of organizational and managerial activities.  1) What are the goals of health Informatization?  2) Determine the social significance and economic effects of Informatization of medicine.  3) Formulate the concept of e-health.	6	Quiz, Interview
2.1.2. Key terms in the field of IT use in healthcare.	Individual work on the topic provides an independent search in Internet databases, reference information systems, electronic textbooks and teaching	6	Quiz, Interview

	<p>AIDS of the following basic terms used in the field of health Informatization, their understanding, memorization and contextual reproduction: "electronic health or e-health", "electronic medical history", "electronic medical record", "electronic records", "electronic documents", " electronic medical archives»</p> <p>1)What are the common challenges in defining key terms in health Informatization?</p> <p>2) Formulate the concept of " Electronic medical history."</p> <p>3) Define the term "Electronic medical record (EMR)»</p> <p>4) What is the model of the subject area of EMR?</p> <p>5) Define the term "Electronic records".</p> <p>6) Define the term "Electronic documents".</p> <p>7) Define the term "Electronic medical archives</p>		
2.3.2. General principles of information security in medical information systems.	<p>Individual work on the subject provides for an independent search in the Internet, and independent study of the text of the "Federal law on personal data 152-FL of the Russian Federation", the language of basic concepts and terms in the document, abstracting the document structure and content of the main sections and values for the information infrastructure of medical, managerial and research activities. In the process of independent work, the student must master the skills of working with legal documents to obtain appropriate professional competencies in the information support of organizational and management activities.</p> <p>1) List the main legal and regulatory acts regulating the requirements for the processes of personal data processing (PD).</p> <p>2) Define the concept of "personal data" - PD.</p> <p>3) What is meant by the operator PD?</p> <p>4) What is the procedure for registration of PD operators and the register of PD operators?</p> <p>5) Formulate the concept of PD in the health care system.</p> <p>6) Give the definition of the term "subject PD".</p> <p>7) What is the order, procedure and registration of consent to provide PD?</p> <p>8) What are the measures to ensure the protection of PD in the implementation of infor-</p>	6	Quiz, Interview

	mation systems in the work of health care institutions		
2.8.2. Special medical information systems.	<p>Information support of medical diagnostic equipment. Basic principles of graphic data recognition programs in electrocardiography and biopotential recording devices.</p> <p>X-ray image recognition software. Computer x-ray and computed tomography software. Computer analysis of microscopic images.</p> <p>1) What is the specifics of the MIS ambulance service?</p> <p>2) What are the features of the organization of information support of the disaster medicine service?</p> <p>3) What are the features of MIS services of transfusion and procurement of blood and blood products?</p> <p>4) What are the specifics of MIS forensic medicine and transplantation?</p> <p>5) What are the specifics of expert decision support systems?</p> <p>6) What are the specifics of medical information pharmaceutical systems of pharmacies and drug supply services?</p>	7	Quiz, Interview
2.10.2. Information and educational medical Internet resources.	<p>Internet educational resources for pre-and post-graduate training of medical specialists. Educational portals for the training of nurses and doctors.</p> <p>Professional medical websites of public and non-governmental organizations and associations of medical specialists. Sites of professional communities of medical specialists.</p> <p>Scientific medical societies on the Internet. Electronic medical libraries and organized databases.</p> <p>Medical reference sites for patients. Individual work of the student is an assessment of the above electronic resources on the basis of HON criteria and submission of a brief conclusion in writing to the lector.</p> <p>1) What is the overall quality of medical information on the Internet according to the data.international the Net Foundation (HON)?</p> <p>2) How and for what was created the the Net Foundation (HON)?</p> <p>3) What are the directions of the international cooperation Fund?</p> <p>4) What is the system of certification of medi-</p>	7	Quiz, Interview

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	cal websites? 5) What is the HON-code database? 6) What are the prospects for the development of certification and evaluation of the quality and reliability of information on medical web sites?		
3.5. The main types of telemedicine activities.	Individual work in studying the work of a typical telemedicine centre, its structural organization, staff, distribution of functional duties of employees, annual plan, list and types of work performed, list of equipment and the direct participation in its operation or participation in specific telemedical event, with the design of brief written report and presentation to the lector  1) List the activities of telemedicine centers 2) What is the Clinical and Advisory activities of the typical TMC? 3) What is the educational and organizational and methodological activities of the typical TMC? 4) What is the educational, information and telecommunication and research work of a typical TMC?	6	Quiz, Interview
<b>TOTAL:</b>		<b>38</b>	<b>A credit</b>

## 8. EDUCATIONAL-METHODICAL AND INFORMATION SUPPORT OF DISCIPLINE


### a) List of recommended literature:

#### Core reading:

1. Omelchenko, V. P. Medical Informatics : textbook / V. P. Omelchenko, A. A. Demidova. – Москва : ГЭОТАР-Медиа, 2021. - 480 с. - ISBN 978-5-9704-6389-5. - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <https://www.studentlibrary.ru/book/ISBN9785970463895.html>
2. Medical informatics = Информатика в медицине : пособие для студентов учреждений высшего образования, обучающихся по специальности 1-79 01 01 «Лечебное дело» [на англ. яз.] : manual for students of higher education institutions studying in the specialty 1-79 01 01 "General Medicine" / С. И. Клинецвич, Е. П. Наумюк, В. М. Завадская и др. - Гродно : ГрГМУ, 2020. - 108 с. - ISBN 9789855952979. - Текст : электронный // ЭБС "Букап" : [сайт]. - URL : <https://www.books-up.ru/ru/book/medical-informatics-13570186/>

#### Supplementary reading:

1. Guide to Medical Informatics for Foreign Students. - Москва : ГЭОТАР-Медиа, 2022. - 272 с. - ISBN 978-5-9704-6898-2. - Электронная версия доступна на сайте ЭБС "Консультант студента" : [сайт]. URL: <https://www.studentlibrary.ru/book/ISBN9785970468982.html>

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2. Guidelines for students to practical lessons for the discipline "Modern medical information systems" Specialty - 31.05.01 «General medicine» Form of study: intramural / J. F. Zerkalova, M. V. Vorotnikova; Ulyanovsk State University, Faculty of Medicine. - Ulyanovsk : UISU, 2019. - Загл. с экрана; На англ. яз.; Неопубликованный ресурс. - Электрон. текстовые дан. (1 файл : 369 Кб). - Текст : электронный. <http://lib.ulsu.ru/MegaPro/Download/MObject/5609>

### Educational-methodical reading:

1. Guidelines for Individual work of students for the discipline "Modern medical information systems" : Specialty - 31.05.01 "General medicine". Form of study: intramural / J. F. Zerkalova, M. V. Vorotnikova; Ulyanovsk State University, Faculty of Medicine, Department of Human Anatomy. - 2023. - 9 p. - Неопубликованный ресурс. - URL: <http://lib.ulsu.ru/MegaPro/Download/MObject/14772> . - Режим доступа: ЭБС УлГУ. - Текст : электронный.

### AGREED:

Leading specialist Стадольникова /  / 2024  
 The position of the worker scientific library Full name signature data


### b) Computer software

The information infrastructure of the Department includes web-pages on the official website of the University, its own computer class for testing students at 8 workplaces, personal computers of modern generation (equipped with each workplace of teachers, staff and graduate students), multimedia lecture complexes (2 stationary and portable), all computers without exception are in the local network of the University and have access to the Internet, printers and copiers, computer equipment. 100% of lectures on specialties of the medical faculty are provided with multimedia presentations, including animations and video clips. The educational process uses more than 30 electronic textbooks and manuals, open Internet resources, including the use in on-line mode during practical classes and lectures, DVD-videos on individual sections of the disciplines taught, the Department has organized a database of electronic textbooks and atlases with network access in the local network of the educational building of the medical faculty.

### c) Professional databases, information and reference systems:

#### 1. Digital Library System:

- 1.1. Цифровой образовательный ресурс IPRsmart : электронно-библиотечная система : сайт / ООО Компания «Ай Пи Ар Медиа». - Саратов, [2024]. – URL: <http://www.iprbookshop.ru>. – Режим доступа: для зарегистрир. пользователей. - Текст : электронный.
- 1.2. Образовательная платформа ЮРАЙТ : образовательный ресурс, электронная библиотека : сайт / ООО Электронное издательство «ЮРАЙТ». – Москва, [2024]. - URL: <https://urait.ru> . – Режим доступа: для зарегистрир. пользователей. - Текст : электронный.
- 1.3. База данных «Электронная библиотека технического ВУЗа (ЭБС «Консультант студента») : электронно-библиотечная система : сайт / ООО «Политехресурс». – Москва, [2024]. – URL: <https://www.studentlibrary.ru/cgi-bin/mb4x>. – Режим доступа: для зарегистрир. пользователей. – Текст : электронный.
- 1.4. Консультант врача. Электронная медицинская библиотека : база данных : сайт / ООО «Высшая школа организации и управления здравоохранением-Комплексный медицинский консалтинг». – Москва, [2024]. – URL: <https://www.rosmedlib.ru>. – Режим доступа: для зарегистрир. пользователей. – Текст : электронный.
- 1.5. Большая медицинская библиотека : электронно-библиотечная система : сайт / ООО «Букап». – Томск, [2024]. – URL: <https://www.books-up.ru/ru/library/> . – Режим доступа: для зарегистрир. пользователей. – Текст : электронный.

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1.6. ЭБС Лань : электронно-библиотечная система : сайт / ООО ЭБС «Лань». – Санкт-Петербург, [2024]. – URL: <https://e.lanbook.com>. – Режим доступа: для зарегистрир. пользо-вателей. – Текст : электронный.

1.7. ЭБС **Znanium.com** : электронно-библиотечная система : сайт / ООО «Знаниум». - Моск-ва, [2024]. - URL: <http://znanium.com> . – Режим доступа : для зарегистрир. пользователей. - Текст : электронный.

**2. КонсультантПлюс** [Электронный ресурс]: справочная правовая система. / ООО «Кон-сультант Плюс» - Электрон. дан. - Москва : КонсультантПлюс, [2024].

**3. eLIBRARY.RU**: научная электронная библиотека : сайт / ООО «Научная Электронная Библиотека». – Москва, [2024]. – URL: <http://elibrary.ru>. – Режим доступа : для авториз. поль-зователей. – Текст : электронный

**4. Федеральная государственная информационная система «Национальная электрон-ная библиотека»** : электронная библиотека : сайт / ФГБУ РГБ. – Москва, [2024]. – URL: <https://нэб.рф>. – Режим доступа : для пользователей научной библиотеки. – Текст : электрон-ный.

**5. Российское образование** : федеральный портал / учредитель ФГАУ «ФИЦТО». – URL: <http://www.edu.ru>. – Текст : электронный.

**6. Электронная библиотечная система УлГУ** : модуль «Электронная библиотека» АБИС Мега-ПРО / ООО «Дата Экспресс». – URL: <http://lib.ulsu.ru/MegaPro/Web>. – Режим доступа : для пользователей научной библиотеки. – Текст : электронный.

#### AGREED:

Инженер ведущий



Щуренко Ю.В.

2024

## 12. MATERIAL AND TECHNICAL SUPPORT OF DISCIPLINE

Audiences for the conduct lectures, for practical work, for ongoing monitoring and intermediate certification, group consultations.

#### Conducting lectures:

1. The lecture hall (№ 404, Building 4, Sviyaga River Embankment, 106)

#### Conducting practical training, ongoing monitoring and intermediate certification, group con- sultations:

1. Classroom № 01 for 16 seats.
2. Classroom № 02 for 26 seats.
3. Classroom № 04 for 26 seats.
4. Classroom № 012 for 26 seats.
5. Classroom № 014 for 40 seats.


Audiences are located at: Ulyanovsk, st. Architect Livchak, 2/1, Faculty of Medicine (ground floor). The classrooms are equipped with specialized furniture, a training board. The lecture halls are equipped with multimedia equipment to provide information to a large audience. The premises for independent work are equipped with computer equipment with the ability to connect to the Internet and provide access to an electronic educational information environment, an electronic library sys- tem.

The rooms for independent work are equipped with computer equipment with the ability to connect to the Internet and provide access to an electronic educational information environment, an electronic library system.

#### The list of equipment used in the educational process:

1. Multimedia projector - 1 pc.



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2. Screen - 1 pc.
3. Speakers - 1 pc.
4. Laptop - 1 pc.
5. Epson printer - 3 pcs.

### 13. SPECIAL CONDITIONS FOR STUDENTS WITH DISABILITIES

Education for BPEP HE students with disabilities is carried out taking into account the peculiarities of psychophysical development, individual empowerment and health status of the students. Education of students with disabilities can be arranged as a shared with other students, as well as separately. If necessary, students from the number of persons with disabilities (at the request of the student) can offer some of the following information perception options tailored to their individual psycho-physical features:

- for the visually impaired: in printed form in large print; in the form of an electronic document; in the form of an audio file (translation of educational materials in audio format); in printed form in Braille; individual consultations involving tactile interpreter; individual tasks and advice.
- for persons with hearing impairments: in printed form; in the form of an electronic document; videos with subtitles; individual counseling with the involvement of a sign language interpreter; individual tasks and advice.
- for people with disorders of the musculoskeletal system: in printed form; in the form of an electronic document; in the form of an audio file; individual tasks and advice. "

If it is necessary to use partially / exclusively distance educational technologies in the educational process, the organization of teaching staff work with students with disabilities and disabled people is provided in the electronic information and educational environment, taking into account their individual psychophysical characteristics.

#### Developers:

Assistant Professor <small>position</small>	/	 <small>signature</small>	/	Zerkalova J.F. <small>full name</small>
Assistant Professor <small>position</small>	/	 <small>signature</small>	/	Vorotnikova M.V. <small>full name</small>

#### Agreed:

Head of Department <small>position</small>	/	 <small>signature</small>	/	Slesareva E.V. <small>full name</small>
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