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Federal State Budget Educational Institution
of Higher Education
Pacific State Medical University
of the Ministry of Health of the Russian Federation

APPROVED BY
First Vice-Rector

_____ / Trankovskaya L.V./
"9" июня 2025

DISCIPLINE WORK PROGRAM

Б1.О.47 Data processing information technologies

(name of discipline)

Specialty	**31.05.03 Dentistry for international students (in English)** (code, name)
Degree	Specialist's degree
Profile	02 "Healthcare" (in the field of providing health care in patients with dental pathology)
Mode of study	Full-time
Period of mastering the BEP	**5 years** (nominal length of study)
Institute	of Fundamentals and Information Technologies in Medicine

Vladivostok, 2025

Program of the discipline **Б1.О.47 Data processing information technologies** is based on:
1) Federal State Educational Standard of Higher Education for the specialty approved by the Order No. 984 of Ministry of Science and Higher Education of the Russian Federation dated August 12, 2020.

2) Curriculum for the 31.05.03 Dentistry for international students (in English), profile 02 "Healthcare" (in the field of providing health care in patients with dental pathology), approved by the Academic Council of FSBEI HE PSMU of the Ministry of Health of Russia, Report No. 8/24-25 dated March 31, 2025.

Work program for the discipline was developed by the writing team of the Institute of Fundamentals and Information Technologies in Medicine of the FSBEI HE PSMU of the Ministry of Health of Russia, under the guidance of the director of the institute Candidate of Biological Sciences Startseva M.S.

Developed by:

Assistant Professor	Candidate of Physical and Mathematical Sciences	Subbotin E.Yu.
(position held)	(academic degree, academic title)	(full name)

1. GENERAL PROVISIONS

1.1. Purpose and Objectives of Mastering Б1.О.47 Data processing information technologies

The purpose of mastering the discipline is to acquire knowledge and skills of using applied and specialized software, means of information support for medical solutions, and automated medical and technological systems for solving the problems of medicine and health care.

Objectives of mastering the discipline:

1. Acquire knowledge modern computer technologies used in medicine and healthcare;
2. Acquire knowledge on mathematical methods, software and technical means of mathematical statistics, computer science used at various stages of obtaining and analyzing biomedical information;
3. Learn about informatization methods used in diagnostic and treatment processes;
4. Learn how to use the Internet to search for biomedical information.

2. DISCIPLINE AS PART OF THE BASIC EDUCATIONAL PROGRAM

Discipline **Б1.О.47 Data processing information technologies** is included in the mandatory part of the Unit 1 of the basic educational program for the specialty 31.05.03 Dentistry for international students (in English), profile 02 "Healthcare" (in the field of providing health care in patients with dental pathology), and is part of the 1st semester's curriculum.

3. PLANNED LEARNING OUTCOMES OF THE DISCIPLINE

3.1. Mastering the discipline **Б1.О.47 Data processing information technologies** is aimed at the development of students' competencies. The discipline facilitates the development of students' competencies corresponding to the types of professional activity.

Name of competency category (group)	**Code and Name of competency of the graduate**	**Competency Indicators**
General Professional Competencies		
Basis of fundamental and natural science knowledge	GPC-8. Is able to use basic concepts and methods of physics, chemistry, mathematics and natural sciences when working to achieve objectives of professional activities	CI.GPC-8_1- employs basic concepts of physics, chemistry, mathematics and natural sciences CI.GPC-8_2- - has a grasp of basic methods of physics, chemistry, mathematics and natural sciences when working to achieve objectives of professional activity CI.GPC-8_3- evaluates the efficacy of basic methods of physics, chemistry, mathematics and natural sciences when working to achieve objectives of professional activity

Information literacy	GPC-13. Is able to achieve objectives of professional activity using information and bibliographic resources, biomedical terminology, as well as information and communication technologies, while observing basic information security procedures	CI.GPC-13_1- searches for and exchanges information using professional bibliographic resources, as well as information and communication technologies CI.GPC-13_2- fluent in biomedical terminology CI.GPC-13_3- understands the information security policies and complies with them when working to achieve objectives of professional activity

3.2. Types of professional activity corresponding to competencies developed over the course of mastering **Б1.О.47 Data processing information technologies**:

Types of professional activity objectives

1. *Medical*

Kinds of professional activity objectives

1. *implementation of anti-epidemic and other measures of public health protection as well as monitoring their effectiveness*

3.3. Planned learning outcomes of mastering the discipline are represented by knowledge, skills, abilities and/or experience, characterize the stages of developing competencies and ensure achievement of the planned outcomes of mastering the basic educational program. Learning outcomes of a discipline are correlated with competency indicators.

4. SCOPE AND CONTENT OF THE DISCIPLINE

4.1. Scope of the Discipline and Types of Academic Work

Type of Academic Work		**Total Hours**	**Semesters**
			1
			hours
1		2	3
Classroom hours (total), including:		**46**	**46**
Lectures (L)		14	14
Practical classes (C)		32	32
Independent work of the student (IW), including:		**26**	**26**
Preparing for classes (CP)		10	10
Preparing for continuous assessment (CAP)		10	10
Preparation for interim assessment (IAP)		6	6
Interim assessment			
Type of interim assessment	pass/fail test (T)	T	T
	exam (E)		
TOTAL: TOTAL credit value	hrs.	**72**	**72**
	credits	**2**	**2**

4.2. Contents of the Discipline

4.2.1. Topics of Discipline Lectures and Academic Hours per Semester

No.	Lecture Topic	Hours
1	2	3
	Semester No. 1	
1.	Medical information. Medical documents. Types of documents and their retention periods	2
2.	Primary and secondary data. Primary and secondary analysis of medical data	2
3.	Hardware and information technologies for collecting medical data. Data collection for genomic and molecular research. Biosensors	2
4.	Electronic medical records (EMR). Electronic personal health records (EPHR). Health information systems (HIS)	2
5.	Archiving, exchange, and standardization systems (DICOM, PACS, RIS). Electronic health (eHealth). Mobile applications (mHealth). Cloud technologies. Telemedicine	2
6.	Big Data. Data Lakes. Data Processing Center (DPC). Clinical Decision Support System (CDSS)	2
7.	Methods of medical data processing. Machine learning. Artificial intelligence in medicine	2
	Hours per semester total	**14**

4.2.2. Topics of Discipline Practical Classes and Academic Hours per Semester

No.	Practical Class Topic	Hours
1	2	3
	Semester No. 1	
1	Assessment of knowledge, skills, and abilities used in creating a medical document	2
2	Practical training: creating complex medical documents for professional reporting using a word processor	4
3	Word processor capabilities for formatting articles, essays, and term papers in accordance with standards Practical training: formatting a thesis	4
4	Creating medical leaflets promoting healthy lifestyle Practical training: designing a medical leaflet	4
5	Slides presentations. Adding animation effects and hyperlinks in slides presentations Practical training: creating multimedia slides presentations on medical topics	4
6	Spreadsheet editor capabilities Practical training: calculating medical parameters and presenting output data as diagrams	4
7	Practical training : creating and automating accounting and reporting documentation in scientific and professional activities	4
8	Applying logical functions and array formulas to one’s professional activity using spreadsheets	2
9	Practical training: merging data from spreadsheets and a word processor	2
10	Final class session. Knowledge and skills test	2
	Hours per semester total	**32**

4.2.3. Independent Work of the Student

No.	Name of the Discipline Section	Type of IW	Total Hours
1	3	4	5
	Semester No. 1		
1	Word processor capabilities for formatting articles, essays, and term papers in accordance with standards	Preparing for continuous assessment, completing the assignment	4
2	Creating complex medical documents for professional reporting using a word processor	Preparing for continuous assessment, completing the assignment	4
3	Creating medical leaflets promoting healthy lifestyle	Preparing for continuous assessment, completing the assignment	4
4	Slides presentations. Creating multimedia slides presentations on medical topics	Preparing for continuous assessment, completing the assignment	4
5	Spreadsheet editor capabilities. Creating and automating accounting and reporting documentation in scientific and professional activities	Preparing for continuous assessment, completing the assignment	6
6	Graphic editors	Preparing for continuous assessment, completing the assignment	4
	Hours per semester total		**26**

5. REQUIREMENTS FOR IMPLEMENTATION OF DISCIPLINE

5.1. Discipline Requirements for Educational Materials and Provided Information

Essential reading

No.	Name/Title, Resource Type	Author(s)/Editor	Publisher Imprint, Web Address	Number of Copies (accesses) in the Library and Information Center
1	**2**	**3**	**4**	**5**
1	«Biomedical Informatics», книга	Edward H. Shortliffe, James J. Cimino	Springer International Publishing, 2021. – 1152 p.	Unlimited access
2	«Biomedical Signals, Imaging, and Informatics», книга	Joseph D. Bronzino, Donald R. Peterson	Taylor & Francis, 2015. – 1468 p.	Unlimited access
3	«Introduction to medical image analysis», книга	Paulsen R. R., Moeslund T. B.	Springer Nature, 2020. – 186 p.	Unlimited access

Supplementary reading

No.	Name/Title, Resource Type	Author(s)/Editor	Publisher Imprint, Web Address	Number of Copies (accesses) in the Library and Information Center
1	**2**	**3**	**4**	**5**
1	«Medical Imaging Systems»,	M. Andreas, S.	Springer Open, 2018. –	Unlimited

	книга	Steidl, V. Christlein, J. Hornegger	259 p.	access
2	«Medical Device Cybersecurity for Engineers and Manufacturers», книга	Wirth A., Gates C., Smith J.	Artech House, 2020. – 270 p.	Unlimited access
3	Medical Statistics: A Textbook for the Health Sciences	Stephen J. Walters, Michael J. Campbell, David Machin	John Wiley & Sons, 2021. – 448 p.	Unlimited access

Online resources

1. Electronic library system "Student Consultant" http://studmedlib.ru/
2. Electronic library system "University Library Online"http://www.biblioclub.ru/
3. Electronic library system "Urait" https://urait.ru/
4. Electronic library system "BookUp" https://www.books-up.ru/
5. Resources owned by the Library and Information Center of FSBEI HE PSMU of the Ministry of Health of Russia https://tgmu.ru/university/bibliotechno-informacionnyj-centr/resursy-bic/sobstvennye/

Online resources and respective user guides are available on the Library and Information Center website Library and Information Center — PSMU (tgmu.ru)

5.2. Discipline Requirements for Facilities and Resources

Information on the facility and resource availability and requirements of the discipline is available on the Facility and resource availability and requirements. FSBEI HE PSMU of the Ministry of Health of Russia (tgmu.ru)" page of the official website of the university.

5.3. List of Information Technologies, Information and Reference Systems, Licensed and Free Software (Including Domestically-developed Software):

1. PolycomTelepresence M100 Desktop Conferencing Application (Videoconference system)
2. SunRav Software tTester
3. 7-PDF Split & Merge
4. ABBYYFineReader
5. Kaspersky Endpoint Security
6. INDIGO online testing system
7. Microsoft Windows 7
8. Microsoft Office Pro Plus 2013
9. 1C:University
10. GARANT system
11. MOODLE (Modular Object-Oriented Dynamic Learning Environment)

6. ASPECTS OF THE IMPLEMENTATION OF THE DISCIPLINE FOR STUDENTS WITH DISABILITIES AND SPECIAL NEEDS

6.1. Availability of Accessible Environment

For students with disabilities and special needs, if a written application is submitted, lectures and practical classes are carried out taking into account health limitations, individual capabilities and medical status (hereinafter referred to as individual characteristics) of the student. Compliance with the following general requirements is ensured: teaching aids for collective and individual use are provided, required technical assistance is provided by an assistant; buildings and premises where lectures and practical classes are taking place meet accessibility requirements, other arrangements lack of which makes it impossible or difficult to master the discipline are made.

6.2. Ensuring Compliance with General Requirements

When lectures and practical classes are carried out at the written application of the student, the following general requirements are met: lectures and practical classes for students with disabilities and special needs take place at the same location as for students who do not have disabilities, if this does not cause difficulties for students; an assistant (assistants), who provide(s) students with the necessary technical assistance taking into account individual characteristics of the student, is (are) provided; necessary teaching aids are provided, taking into account individual characteristics of the student.

6.3. Availability of the Internal Policies and Procedures of FSBEI HE PSMU of the Ministry of Health of Russia to Students with Disabilities in a Format Accessible to Them.

All internal policies and procedures of FSBEI HE PSMU of the Ministry of Health of Russia concerning the discipline are made available to students with disabilities in a format accessible to them.

6.4. Increase in the Time Limit of Interim Assessment for Students with Disabilities and Special Needs in Relation to the Established duration

Format of the interim assessment of academic performance within the scope of the discipline conducted for students with disabilities and special needs is selected taking into account individual characteristics of the students (orally, by writing on paper, by typing on a computer, as a test, etc.). The duration of the interim assessment in relation to the established duration is increased at the written application of the student with disabilities. Time limit for the student's preparation for the test is increased by at least 0.5 hours.

7. STAFFING REQUIREMENTS OF THE DISCIPLINE

Academic teaching personnel that ensure the implementation of the discipline education process meet the requirements of the Federal State Educational Standard of Higher Education for the 31.05.03 Dentistry for international students (in English) specialty; list of the aforementioned personnel is available on the website of the educational organization.



8. TUTORIAL WORK

Type of tutorial work	Forms and approaches to tutorial work	Assessment criteria
Assistance in personal growth	Overt Talks and problem-centric debates aimed at promotion of healthy lifestyle. Participation in interdepartmental conferences aimed at formation of healthy lifestyle and development of skills necessary to preserve and improve health.	Portfolio

	Covert – creating atmosphere and infrastructure. Developing a culture of healthy lifestyle, the ability to preserve and improve health. Creating atmosphere of kindness and respect with a high level of communication during implementation of the discipline.	
Civic position and values	Overt Conducting events that facilitate development of civil culture (roundtable discussions, discussions/debates, and talks). Short discussions on current significant events in case the latter occur.	Portfolio
	Covert Focusing on civic values-oriented position and legal awareness. Cultivating mindful social position during professional activity.	
Social values	Overt Highlighting aspects of organization of healthy lifestyle based on health-preserving technologies. Highlighting ecology-related questions, environmental issues as a factor affecting population health and select population risks.	Portfolio
	Covert Identification in social structure during period of education and in professional activity.	