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**Federal State Autonomous Educational Institution of Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA
NAMED AFTER PATRICE LUMUMBA
RUDN University**

Institute of Medicine

educational division (faculty/institute/academy) as higher education programme developer

COURSE SYLLABUS

MEDICAL INFORMATICS

Recommended by the Didactic Council for the Education Field of:

31.05.03 Dentistry

field of studies / speciality code and title

The course instruction is implemented within the professional education programme of higher education:

Dentistry

higher education programme profile/specialisation title

1. COURSE GOAL(s)

The discipline "Medical informatics" is included in the program of the specialty "Dentistry" in the direction 31.05.03 "Dentistry" and is studied in the 1st semester of the 1st year. The discipline is implemented by the Department of Medical Informatics and Telemedicine. The discipline consists of 6 sections and 16 topics and is aimed at studying the basics of modern information technologies with trends in their development.

The goal of the course "Medical Informatics" is to teach students the basics of medical informatics, methods of informatization of medical activity, principles of building information models, analyzing the results obtained, and applying modern information technologies in professional activities.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course (module) "Medical Informatics" is aimed at the development of the following competences /competences in part: (GPC)-13.

Table 2.1. List of competences that students acquire through the course study

Competence code	Competence descriptor	Competence formation indicators (within this course)
GPC-13	Able to solve standard tasks of professional activity using information, bibliographic resources, biomedical terminology, information and communication technologies, taking into account the basic requirements of information security	GPC-13.1 Be able to use modern information and communication tools and technologies in professional activities
		GPC-13.2 Be able to follow the rules of information security in professional activities

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course refers to the core/variable/elective* component of (B1) block of the higher educational programme curriculum.

* - Underline whatever applicable.

Within the higher education programme students also master other (modules) and / or internships that contribute to the achievement of the expected learning outcomes as results of the course study.

Table 3.1. The list of the higher education programme components/disciplines that contribute to the achievement of the expected learning outcomes as the course study results

Code	Competence descriptor	Previous Disciplines (Modules)*	Subsequent Disciplines (Modules)*
GPC-13	Able to solve standard tasks of professional activity using information, bibliographic resources, biomedical terminology, information and communication technologies, taking into account the basic requirements of information security		Physics Human Anatomy - Anatomy of Head and Neck Pharmacology Obstetrics Medical Rehabilitation Telemedicine

* To be filled in according to the competence matrix of the higher education programme.

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the course is 3 credits (108 academic hours).

*Table 4.1. Types of academic activities during the periods of higher education programme mastering (**full-time training**)**

Type of academic activities		Total academic hours	Semesters/training modules			
			1			
<i>Contact academic hours</i>		<i>51</i>	<i>51</i>			
including:						
Lectures (LC)						
Lab work (LW)		51	51			
Seminars (workshops/tutorials) (S)		-	-			
<i>Self-studies</i>		<i>30</i>	<i>30</i>			
<i>Evaluation and assessment (exam/passing/failing grade)</i>		<i>27</i>	<i>27</i>			
Course workload	academic hours	108	108			
	credits	3	3			

5. COURSE CONTENTS

Table 5.1. Course contents and academic activities types

Course module title	Course module contents (topics)	Academic activities types
Module 1 Introduction to Medical Informatics	Topic 1.1. Basic concepts of medical informatics	LW
	Topic 1.2. Medical Informatics Hardware	LW
	Topic 1.2. Software tools for the implementation of information processes	LW
Module 2	Topic 2.1. Introduction to word	LW

Course module title	Course module contents (topics)	Academic activities types
Technology for processing medical data using word processors	processors Microsoft Word, Open Office Writer	
	Topic 2.2. Document formatting, special functions.	LW
	Topic 2.3. Word processor: tables	LW
Module 3 Medical data processing technologies using spreadsheets	Topic 3.1. Introduction to spreadsheet processors Microsoft Excel, OpenOffice Calc	LW
	Topic 3.2. Using math functions in Microsoft Excel, Open Office Calc	LW
	Topic 3.3. Medical data visualization in a spreadsheet	LW
Module 4 Technologies for storing and processing medical data using Database Management Systems	Topic 4.1. Introduction to data base Microsoft Access and OpenOffice Base	LW
	Topic 4.2. Working in a DBMS with medical data.	LW
Module 5 Computer networks in medicine	Topic 5.1. Network technologies	LW
	Topic 5.2. Internal electronic resources of RUDN University	LW
Module 6 Python in medicine	Topic 6.1. Basics of Python programming for calculating medical indicators.	LW
	Topic 6.2. Artificial intelligence in Python.	LW

* - to be filled in only for **full**-time training; *LC* - lectures; *LW* - lab work; *S* - seminars.

6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. Classroom equipment and technology support requirements

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
Computer-Lab	Computer Lab Classroom can be used for seminars, lab works and consulting. Equipped with a set of specialized furniture, computers with access to electronic information and educational	Set of specialized furniture; whiteboard; a set of devices includes portable multimedia projector TOSHIBA X200, laptop ASUS F9E Core 2 DUO T5750, Monoblocks Acer Aspire C24-865, Lenovo V30a-24IML All-In-One 23,8", Acer Z3-615. projection screen, stable wireless Internet connection. Software: Microsoft Windows, MS Office / Office 365, MS Teams, Chrome (latest stable

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
	environment (EIEE)	release)
Self-studies	Classroom for self-study (can be used for seminars and consulting. Equipped with a set of specialized furniture, computers with access to electronic information and educational environment (EIEE)	Set of specialized furniture; whiteboard; a set of devices includes portable multimedia projector Epson EB-965H, TOSHIBA X200, laptop ASUS F9E Core 2 DUO T5750, Monoblocks Acer Aspire C24-865, Lenovo V30a-24IML All-In-One 23,8", Acer Z3-615 laptop, projection screen, stable wireless Internet connection. Software: Microsoft Windows, MS Office / Office 365, MS Teams, Chrome (latest stable release)

7. RESOURCES RECOMMENDED FOR COURSE STUDY

Main readings:

- Medical Informatics. Laboratory Practice: лабораторный практикум / Е.А. Лукьянова, Т.В. Ляпунова, Е.М. Шимкевич [и др.]. - Книга на английском языке. - Москва : РУДН, 2020. - 32 с. URL: https://lib.rudn.ru/MegaPro/UserEntry?Action=Link_FindDoc&id=491974&idb=0
- Тестовые вопросы по медицинской информатике English Medium : учебно-методическое пособие (на английском языке) / В.Д. Проценко, Е.А. Лукьянова, Т.В. Ляпунова, Е.М. Шимкевич. - Электронные текстовые данные. - М. : РУДН, 2017. - 72 с. URL: https://lib.rudn.ru/MegaPro/UserEntry?Action=Link_FindDoc&id=460187&idb=0
- Никитина, Т. П. Программирование. Основы Python для инженеров : учебное пособие для вузов / Т. П. Никитина, Л. В. Королев. — 2-е изд., стер. — Санкт-Петербург : Лань, 2025. — 156 с. — ISBN 978-5-507-50668-2. — Текст : электронный // Лань : электронно-библиотечная система. — URL: <https://e.lanbook.com/book/454463> (дата обращения: 08.04.2025). — Режим доступа: для авториз. пользователей.
- Янцев, В. В. Web-программирование на Python : учебное пособие для вузов / В. В. Янцев. — 3-е изд., перераб. — Санкт-Петербург : Лань, 2024. — 180 с. — ISBN 978-5-507-48364-8. — Текст : электронный // Лань : электронно-библиотечная система. — URL: <https://e.lanbook.com/book/392993> (дата обращения: 08.04.2025). — Режим доступа: для авториз.

Additional readings:

- Omelchenko V.P. Medical Informatics: textbook / V.P.Omelchenko, A. A. Demidova. - Книга на английском языке. - Moscow : GEOTAR-Media, 2021. - 480 p. URL: https://lib.rudn.ru/MegaPro/UserEntry?Action=Link_FindDoc&id=503715&idb=0

Internet-(based) sources:

1. EBS of RUDN University and third-party EBS to which students have access on the basis of concluded agreements:

- RUDN University Library System <http://lib.rudn.ru/MegaPro/Web>
- EBS "University Library Online" <http://www.biblioclub.ru>
- EBS "Yurayt" <http://www.biblio-online.ru>
- EBS "Student Consultant" www.studentlibrary.ru
- EBS "Lan" <http://e.lanbook.com/>
- TUIS: <http://esystem.rudn.ru/>

2. Database of medical and biological publications:

- Yandex search engine <https://www.yandex.ru/>
- Google search engine <https://www.google.ru/>
- SCOPUS abstract database <http://www.elsevierscience.ru/products/scopus/>

Learning toolkits for self- studies located in RUDN LMS TUIS.

1. Learning toolkits for implementation of control work and self-study on «Medical informatics»

8. ASSESSMENT TOOLKIT AND GRADING SYSTEM* FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL UPON COURSE COMPLETION

Evaluation materials and point-rating system* for assessing the level of competence formation (GPC-13) based on the results of mastering the discipline «Medical informatics» are presented in the Appendix to this Work Program of the discipline.

* The assessment toolkit and the grading system are formed on the basis of the requirements of the relevant local normative act of RUDN University (regulations / order).

DEVELOPERS:

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