

Документ подписан простой электронной подписью
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**Federal State Autonomous Educational Institution for 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

Biology

course title

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
program of higher education:**

Dentistry

higher education programme profile/specialisation title

2023-2024

1. COURSE GOAL(s)

The goal of the course “Biology” is to equip students with knowledge and skills in the field of general biology, parasitology, classical, molecular, medical, and ecological genetics, which are necessary for the formation of the scientific worldview and practical activities of the physician.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course (module) “Biology” is aimed at the development of the following competences /competences in part: **General Professional Competences- (GPC)-8**

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

Competence code	Competence descriptor	Competence formation indicators (within this course)
GPC-8	Being able to use main physical and chemical, mathematic and scientific notions and methods when dealing with professional tasks	GPC-8.2 Applying basic fundamental physical and chemical knowledge to deal with professional tasks

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

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
GPC-8	Being able to use main physical and chemical, mathematic and scientific notions and methods when dealing with professional tasks	-	Mathematics, Physics, Dental modeling of teeth, Physiotherapy of dental diseases

* 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 5 credits (180 academic hours).

Table 4.1. Types of academic activities during the periods of higher education programme mastering

Type of academic activities	Total academic hours	Semesters/training modules		
		1	2	
<i>Contact academic hours</i>	105	51	54	
Including:				
Lectures (LC)	35	17	18	
Lab work (LW)	70	34	36	
Seminars (workshops/tutorials) (S)				
<i>Self-studies</i>	48	12	36	
<i>Evaluation and assessment (exam/passing/failing grade)</i>	27	9	18	
Course workload	academic hours	180	72	108
	credits	5	2	3

* To be filled in regarding the higher education programme correspondence training mode.

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 Biology. The cell as a unit of life	Topic 1.1. The cell as a unit of life	LW
	Topic 1.2. The chemical components of a cell. The structure and functions of the cell membrane.	LW
Module 2 Genetic material. Structure and functions of nucleic acids	Topic 2.1. Structure and functions of nucleic acids. Genetic code	LC, LW
	Topic 2.2. DNA replication. Gene mutations	LC, LW
	Topic 2.3. Variability of living things. Chromosomal and gene mutations. DNA repair	LC
Module 3 Gene expression	Topic 3.1. Synthesis of RNA molecules in prokaryotic cells. Control of gene expression in prokaryotes. Operon	LC, LW
	Topic 3.2. Synthesis of RNA molecules in eukaryotic cells. Processing of RNA molecules	LC, LW
	Topic 3.3. Translation in prokaryotic and eukaryotic cells	LC, LW
	Topic 3.4. Genetic material of viruses, prokaryotes and eukaryotes. Chromosomal and extrachromosomal DNA. Mobile genetic elements	LC

Course module title	Course module contents (topics)	Academic activities types
Module 4 Cell division	Topic 4.1. Structure of eukaryotic chromosomes. Karyotype. Genes	LW
	Topic 4.2. The cell cycle, mitotic cell division. The control of the cell cycle	LW
	Topic 4.3. Meiotic cell division	LW
Module 5 Concepts of Genetics	Topic 5.1. Law of segregation. Interaction of allelic genes	LW
	Topic 5.2. Law of independent assortment. Interaction of non-allelic genes	LW
	Topic 5.3. Sex-linked inheritance	LW
	Topic 5.4. Inheritance of linked genes. Genetic analysis	LW
Module 6 Human Genetics	Topic 6.1. History of Genetics	LC
	Topic 6.2. Human Genetics. Human genome	LC, LW
	Topic 6.3. Chromosomal diseases	LC
	Topic 6.4. Gene diseases	LC
	Topic 6.5. Non-Mendelian diseases	LC
	Topic 6.6. Genetic engineering. Gene therapy	LC
	Topic 6.7. Methods in Human Genetics. Pedigree analysis. Twin study	LW
	Topic 6.8. Cytogenetic method. Population study	LW
	Topic 6.9. Methods of Molecular Genetics	LW
Module 7 Medical Parasitology	Topic 7.1. Basic concepts of medical parasitology	LC
	Topic 7.2. Subkingdom Protozoa. Phylum Sarcomastigophora. Class Rhizopoda	LW
	Topic 7.3. Class Zoomastigophorea	LW
	Topic 7.4. Phylum Apicomplexa, Class Sporozoa. Phylum Ciliophora, Class Ciliata	LW
	Topic 7.5. Phylum Platyhelminthes. Class Trematoda	LW
	Topic 7.6. Class Cestoda	LW
	Topic 7.7. Phylum Nematelminthes. Class Nematoda. Geohelminths	LW
	Topic 7.8. Class Nematoda. Biohelminths	LW
	Topic 7.9. Phylum Arthropoda. Subphylum Branchiata, class Crustacea. Subphylum Chelicerata, class Arachnida	LW
	Topic 7.10. Subphylum Tracheata, Class Insecta, order Diptera	LW
	Topic 7.11. Subphylum Tracheata, Class Insecta, human parasites	LW
Module 8 Evolution of the organic	Topic 8.1. History of evolutionary ideas	LC
	Topic 8.2. The main points of the modern	LC

Course module title	Course module contents (topics)	Academic activities types
world. Anthropogenesis	evolution theory	
	Topic 8.3. Anthropogenesis	LC
Module 9 Man and the Biosphere	Topic 9.1. Man and the Biosphere	LC

* - 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)
Lecture	Lecture/Seminars/ Lab Classroom, equipped with a set of specialized furniture (328, 329, 330, 331, 342, 343)	A set of specialized furniture; whiteboard; a set of devices includes multimedia projector, laptop, projection screen, stable wireless Internet connection. Software: Microsoft Windows, MS Office / Office 365, MS Teams, Chrome (latest stable release), Microscopes
Lab work	Laboratory of Biomolecular research (332, 332A)	PCR laboratory equipment
Self-studies	Self-studies classroom, equipped with a set of specialized furniture (342)	A set of specialized furniture; whiteboard; a set of devices includes multimedia projector, 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:

1. Klug W.S., Cummings M.R., Spencer C.A., Palladio M.A. Concepts of genetics. – Pearson Education International. – 2014.
2. Myandina G.I. Medical parasitology. – M.: PFU. – 2014.

Additional readings:

1. General genetics [Text/electronic resource] = General Genetics. Manual for Graduate Students : Textbook / E.V. Romanov, P. Keziman. - Book in English; Electronic text data. - M. : Publishing House of RUDN University, 2018. - 104 p.
2. Fletcher H., Hickey I. Genetics. – Garland Science. – 2013.
3. Lewin B. Genes. – Oxford University Press. – 2012.
4. Color Atlas of Genetics / Passarge Eberhard. - 4th edition, revised and update. - Stuttgart ; New York : Thieme, 2013.
5. Vogel and Motulsky's Human Genetics: Problems and Approaches / M. Speicher, Antonarakis S.E., Motulsky A.G. – Springer. – 2010.
6. Gardner A., Davies T. Human Genetics. – Scion Publishing Ltd. – 2009.
7. Stryer L., Berg L., Stryer L., Berg L., Stryer L., Berg L. – Working with Molecular Cell Biology (Fifth Edition). – W.H. Freeman and Company, New York. – 2004.
8. Gangane S.D. Human Genetics (Second edition). - Elsevier. Reed Elsevier India Private Limited. – 2004.
9. Heelan J.S., Ingersol F.W. Essentials of Human Parasitology. – Delmar. Thomson Learning. - 2002.

Internet sources:

1. Electronic libraries with access for RUDN students:

- RUDN online library <http://lib.rudn.ru/MegaPro/Web>
- Royal Society of Chemistry <http://pubs.rsc.org/>
- Scientific electronic library: - <http://elibrary.ru>
- Nature - <http://www.nature.com/siteindex/index.html>
- OxfordJournals - <https://academic.oup.com/journals/>
- <http://www.biblioclub.ru>
- <http://www.biblio-online.ru>
- www.studentlibrary.ru
- <http://e.lanbook.com/>

1. Databases and search engines:

- National Center for Biotechnology Information (NCBI) - www.ncbi.nlm.nih.gov
- ScienceDirect - <http://www.sciencedirect.com>
- Google Academy - <http://scholar.google.ru/>
- SCOPUS <http://www.scopus.com/>

*Training toolkit for self- studies to master the course *:*

The set of lectures on the course “Biology”

* The training toolkit for self- studies to master the course is placed on the course page in the university telecommunication training and information system under the set procedure.

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

The assessment toolkit and the grading system* to evaluate the competences formation level (**GPC-8**) upon the course study completion are specified in the Appendix to the course syllabus.

* 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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position, department

signature

name and surname

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