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**Federal State Autonomous Educational Institution for Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA
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 Dental medicine

field of studies / speciality code and title

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

Dental medicine

higher education programme profile/specialisation title

1. COURSE GOAL

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

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the Biology course is aimed at the development of the following competences (competences in part): 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 component of (B1) block of the higher educational programme curriculum.

Within the higher education programme students also master other courses 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	Subsequent courses
GPC-8	Being able to use main physical and chemical, mathematic and scientific notions and methods when dealing with professional tasks	Mathematics, Physics	Physiotherapy of dental diseases, Obstetrics

* 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 (**full-time training**)*

Type of academic activities	Total academic hours	Semesters	
		2	3
Contact academic hours	105	54	51
including:			
Lectures (LC)	35	18	17
Lab work (LW)	70	36	34
Seminars (workshops/tutorials) (S)			
Self-studies	39	36	3
Evaluation and assessment (exam/passing/failing grade)	36	18	18
Course workload	academic hours	180	108
	credits	5	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 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
Module 4 Cell division	Topic 4.1. Structure of eukaryotic chromosomes. Karyotype. Genes	LW

Course module title	Course module contents (topics)	Academic activities types
	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	Topic 8.1. History of evolutionary ideas	LC

Course module title	Course module contents (topics)	Academic activities types
Evolution of the organic world. Anthropogenesis	Topic 8.2. The main points of the modern evolution theory	LC
	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 classrooms	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
Specialized classroom	A classroom for laboratory work, individual consultations, current and mid-term assessment; equipped with a set of specialised furniture and machinery (328, 329, 330, 331, 342, 343)	A set of specialized furniture; whiteboard; technical means of multimedia presentations. Microscopes. Software: Microsoft Windows, MS Office / Office 365, MS Teams.
Laboratory	Laboratory of Molecular Genetics (332, 332A)	PCR laboratory equipment
Classroom for independent work of students	A classroom for independent work of students (can be used for seminars and consultations), equipped with a set of specialised furniture (342)	A set of specialized furniture; whiteboard; technical means of multimedia presentations.

* The premises for students' self-studies are subject to **MANDATORY** mention

7. RESOURCES RECOMMENDED FOR COURSE STUDY

Main readings:

- Essential medical biology. V. 1 : Cell biology / N. V. Chebyhev, I.A. Berechikidze, S.M. Kuzin [и др.] ; Ed. by N.V. Chebyshev. - Книга на английском языке. - Moscow : Medical Informational Agency, 2020. - 113 p.

2. Essential medical biology. V.2 : Genetics / N. V. Chebyhev, S.H. Larina, E.S. Gorozhanina [и др.] ; Ed. by N.V. Chebyshev. - Книга на английском языке. - Moscow : Medical Informational Agency, 2020. - 112 p.
3. Essential medical biology. V. 3 : Human parasitology / N. V. Chebyhev, I.A. Berechikidze, G.G. Grineva [и др.] ; Ed. by N.V. Chebyshev. - Книга на английском языке. - Moscow : Medical Informational Agency, 2020. - 264 p.
4. Myandina G.I. Medical parasitology. – М.: PFU. – 2014. https://lib.rudn.ru:443/MegaPro/UserEntry?Action=Link_FindDoc&id=444651&idb=0

Additional readings:

1. Общая генетика [Текст/электронный ресурс] = General Genetics. Manual for Graduate Students : Учебное пособие / Е.В. Романова, П. Кезимана. - Книга на английском языке; Электронные текстовые данные. - М. : Изд-во РУДН, 2018. - 104 с.
2. Fletcher H., Hickey I. Genetics. – Garland Science. – 2013.
3. Klug W.S., Cummings M.R., Spencer C.A., Palladio M.A. Concepts of genetics. – Pearson Education International. – 2014.
4. Lewin B. Genes. – Oxford University Press. – 2012.
5. Color Atlas of Genetics / Passarge Eberhard. - 4th edition, revised and update. - Stuttgart ; New York : Thieme, 2013.
6. Vogel and Motulsky's Human Genetics: Problems and Approaches / M. Speicher, Antonarakis S.E., Motulsky A.G. – Springer. – 2010.

Internet sources:

1. Electronic libraries with access for RUDN students:
 - RUDN online library <http://lib.rudn.ru/MegaPro/Web>
 - Scientific electronic library: - <http://elibrary.ru>
 - Nature - <http://www.nature.com/siteindex/index.html>
 - EL "University Library Online" <http://www.biblioclub.ru>
 - <http://www.biblio-online.ru>
 - EL "Student Consultant" www.studentlibrary.ru
 - EL "Lan" <http://e.lanbook.com/>
 - EL "Yurayt" <http://www.biblio-online.ru>

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 *:*

1. Biology workbook
2. Methodological recommendations on discipline study

* 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 (competences in part) 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).

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