Federal State Autonomous Educational Institution of Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA
RUDN University

Agrarian and Technological Institute

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

COURSE SYLLABUS

Immunology

course title

Recommended by the Didactic Council for the Education Field of:

36.05.01 Veterinary

field of studies / speciality code and title

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

Veterinary

higher education programme profile/specialisation title

2024

1. GOALS AND OBJECTIVES OF THE COURSE

The aim of mastering the course "**Immunology**" is to form students' modern knowledge of fundamental and applied immunology, the formation of students' practical skills in using the achievements of immunology in working with animals and in clinical and research laboratories.

2. REQUIREMENTS FOR LEARNING OUTCOMES

The implementation of the course "**Immunology**" is aimed at creating the following competencies (parts of competencies) for students:

Table 2.1. List of competencies formed by students during the development of the course (results of the development of the course)

Competence code	**Competence descriptor**	**Indicators of competence accomplishment** (within the course)
GPC-4	Is able to use in professional activity methods to solve problems using modern equipment in the development of new technologies and use modern professional methodology to conduct experimental research and interpretation of the results	GPC-4.1 Has the conceptual and methodological apparatus of the basic natural sciences at a level sufficient for full professional activity at the modern level
		GPC-4.3 Willing to use modern methodology in designing and conducting experimental research
		GPC-4.4 Uses modern professional methodology in interpreting research results

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course "**Immunology**" refers to the mandatory part of block B1 of the Educational Program of Higher Education.

As part of the Educational Program of Higher Education, students also master other courses and /or practices that contribute to achieving the planned results of mastering the course "**Immunology**".

Table 3.1. List of Higher Education Program components courses that contribute to expected learning outcomes

Competence code	**Competence descriptor**	**Previous courses/modules, internships***	**Subsequent courses/modules, internships***
GPC-4	Is able to use in professional activity methods to solve problems using modern equipment in	Inorganic and analytical chemistry Organic chemistry Biological physics	Laboratory diagnostics of infectious and invasive diseases

	the development of new technologies and use modern professional methodology to conduct experimental research and interpretation of the results	Physical and Colloidal Chemistry Biological chemistry Maths	Veterinary and industrial laboratories with design basics Study practice Clinical internship Industrial practice Academic research practice with the preparation of a scientific qualification project Preparation for and passing the state exam

4. COURSE WORKLOAD AND TRAINING ACTIVITIES

Course workload of the course "**Immunology** " is 2 credits.

*Table 4.1. Types of academic activities during the period of the HE program mastering for **full-time** study*

Types of academic activities		**HOURS**	**Semesters**			
			6	**-**	**-**	**-**
Contact academic hours		34	34	-	-	-
including						
Lectures		17	17	-	-	-
Lab work		-	-	-	-	-
Seminars (workshops/tutorials)		17	17	-	-	-
Self-study		28	28	-	-	-
Evaluation and assessment (exam/pass/fail grading)		10	10	-	-	-
Course workload	Academic hour	**72**	**72**	**-**	**-**	-
	Credit unit	**2**	**2**	**-**	**-**	-

5. COURSE CONTENTS

Table 5.1 Content of the course (module) by type of academic work

Modules	**Content of the modules (topics)**	**Types of academic activities**
Module 1. General immunology	Topic 1.1. Introduction. History of immunology. Mechanisms of innate immunity.	Lectures, Seminars
	Topic 1.2. Organs, tissues and cells of the immune system.	Lectures, Seminars
	Topic 1.3. Effector mechanisms of immunity.	Lectures, Seminars

Module 2. Clinical immunology	Topic 2.1. Immune response. Mechanisms of hypersensitivity. Autoimmunity.	Lectures, Seminars
	Topic 2.2. The immune system of ontogenesis and carcinogenesis. Immunodeficiency.	Lectures, Seminars
	Topic 2.3. Immunotherapy.	Lectures, Seminars

6. COURSE EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. Material and technical support of the course

Classroom for Academic Activity Type	***Equipping the classroom***	**Specialized educational/laboratory equipment, software and materials for the development of the course** (if necessary)
Lecture	An auditorium for conducting lecture-type classes, equipped with a set of specialized furniture; a board (screen) and technical means of multimedia presentations.	- *Information stands.* - *Microscopes.*
Seminary	An auditorium for conducting seminar-type classes, group and individual consultations, ongoing monitoring and interim certification, equipped with a set of specialized furniture and multimedia presentation equipment.	- *Information stands.* - *Microscopes.*
Self-studies	An auditorium for independent work of students (can be used for seminars and consultations), equipped with a set of specialized furniture and computers with access to an electronic information and educational environment.	-

7. RESOURCES RECOMMENDED FOR COURSE STUDIES

Main readings:

1. Skopichev V.G. Morpho-physiological and immunological aspects of animal husbandry : a textbook for bachelors / V.G. Skopichev, N.N. Maksimyuk. - Electronic text data. - St. Petersburg : Quadro, 2020. - 560 p.
2. Sarukhanova L. E. General microbiology, virology and applied immunology: textbook / Sarukhanova L. E., Volina E. G. Yashina N. V. – 3rd ed., ispr. - M.: RUDN, 2020, 2022. – 172 p.

Additional Readings:

1. Krishtoforova B.V.,, Lemeshchenko V.In, Practical morphology of animals with the basics of immunology – M.: Lan, 2016 – 164c. https://e.lanbook.com/book/72987
2. Gosmanov R.G., Ibragimova A.I. Microbiology and immunology / Galiullin A.K. – M.: Lan, 2013 – 240s. https://e.lanbook.com/book/12976
3. Veterinary immunology = Introduction To Veterinary Immunology : an educational and methodical manual / Yu.A. Vatnikov, V.M. Byakhova, E.V. Kulikov, A.A. Gazin. - Book in English; electronic text data. - Moscow : RUDN, 2020. - 105 p.

Internet sources

1. Electronic libraries (EL) of RUDN University and other institutions, to which university students have access on the basis of concluded agreements:

- RUDN Electronic Library System (RUDN ELS) http://lib.rudn.ru/MegaPro/Web
- EL "University Library Online" http://www.biblioclub.ru
- EL "Yurayt" http://www.biblio-online.ru
- EL "Student Consultant" www.studentlibrary.ru
- EL "Lan" http://e.lanbook.com/
- EL "Trinity Bridge"

2.*Databases and search engines:*

- electronic foundation of legal and normative-technical documentation http://docs.cntd.ru/
- Yandex search engine https:// www.yandex.ru/
- Google search engine https://www.google.ru/
- Scopus abstract database http://www.elsevierscience.ru/products/scopus/

Educational and methodological materials for independent work of students during the development of the course/ module*:

1. A course of lectures on the course "**Immunology**".
2. Seminars workshop on the course "**Immunology**".

* - The training toolkit and guidelines for the internship are placed on the internship 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 AS COURSE RESULTS

The assessment toolkit and the grading system* to evaluate the level of competences (competences in part) formation as the course results 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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