Federal State Autonomous Educational Institution of Higher Education
Peoples' Friendship University of Russia named after Patrice Lumumba
RUDN University

Agrarian and Technological Institute

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

COURSE SYLLABUS

VIROLOGY

course title

Recommended by the Didactic Council for the Education Field of:

35.04.04 AGRONOMY

field of studies / speciality code and title

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

INTEGRATED PLANT PROTECTION

higher education programme profile/specialisation title

2026

1. COURSE GOAL(s)

The discipline "Virology" is part of the Master's program "Integrated Plant Protection" under the field of study 35.04.04 "Agronomy" and is studied in the 3rd semester of the 2nd year. The discipline is delivered by the Agrobiotechnology Department.

The discipline consists of 6 sections and 20 topics and is aimed at studying viral infections and methods of combating them.

The purpose of mastering the discipline is: formation of basic knowledge about the methods and ways of spreading viral infection, measures to prevent infection of plants and methods of localization of lesions, familiarization with modern methods of identification and diagnosis of viruses.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the discipline "Virology" is aimed at developing the following competencies (parts of competencies) in students:

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

Competence code	**Competence descriptor**	**Competence formation indicators** (within this course)
GPC-1	Able to solve problems of development of the field of professional activity and/or organization based on the analysis of scientific and production achievements	GPC-1.2 Uses methods for solving problems of agronomy development based on search and analysis of modern scientific and production achievements;
GPC-4	Able to conduct scientific research, analyze results and prepare reporting documents	GPC-4.2 Uses information resources, scientific, experimental and instrumental base for conducting research in agronomy; GPC-4.3 Formulates the results obtained during the solution of research problems;
PC-4	Able to create models of crop cultivation technologies, plant protection systems, and varieties	PC-4.5 Carries out plant protection activities against harmful organisms; PC-4.6 Develops and improves measures for plant protection against harmful organisms;
PC-7	Able to carry out phytosanitary control at the state border to protect the territory of the Russian Federation from the penetration of quarantine and other dangerous pathogens of plant diseases and pests, and weeds	PC-7.1 Recognizes quarantine objects and identifies quarantine pests and pathogens; PC-7.2 Conducts examination of crops and plant products for the presence of quarantine objects;

3.COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The discipline "Virology" belongs to the mandatory part of Block 1 "Disciplines (modules)" of the higher education program.

Within the framework of the higher education program, students also master other disciplines and/or practices that contribute to achieving the planned learning outcomes of the discipline "Virology".

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-1	Able to solve problems of development of the field of professional activity and/or organization based on the analysis of scientific and production achievements	Biological Method of Plant Protection; Instrumental methods of research; Bacterial Diseases; Information Technology; Scientific research work; Scientific and Research Practice;	Biotechnology in Plant Protection; Plant Quarantine; Plant immunity; Scientific research work;
GPC-4	Able to conduct scientific research, analyze results and prepare reporting documents	Scientific research work; Scientific and Research Practice; Instrumental methods of research; Bacterial Diseases; Biological Method of Plant Protection;	Scientific research work; Undergraduate practice/Pre-diploma practice; Plant Quarantine; Biotechnology in Plant Protection; Plant immunity;
PC-4	Able to create models of crop cultivation technologies, plant protection systems, and varieties	Scientific and Research Practice; Biological Method of Plant Protection; Plant Protection in Organic Farming**; Pest Risk Analysis**; Forecast of Development of Agricultural Pests and Diseases**; Nematodes**; Weed biology and management**; Bacterial Diseases;	Plant immunity;
PC-7	Able to carry out phytosanitary control at the state border to protect the territory of the Russian Federation from the penetration of quarantine and other dangerous pathogens of plant diseases and pests, and weeds	Nematodes**; Molecular Methods of Diagnostics**; Bacterial Diseases;	Plant Quarantine;

* To be filled in according to the competence matrix of the higher education programme.
** – Elective disciplines/practices

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total labor intensity of the discipline "Virology" is 4 credit units.

*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
Contact academic hours		*68*	*68*
including:			
Lectures (LC)		34	34
Lab work (LW)		0	0
Seminars (workshops/tutorials) (S)		34	34
Self-studies		*48*	*48*
Evaluation and assessment (exam/passing/failing grade)		*28*	*28*
Course workload	academic hours	**144**	144
	credits	**4**	4

* 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 Virology	Topic 1.1. The subject and history of virology	LC, S
Module 2: Morphological and biological features	Topic 2.1. Classification of viruses, viroids and phytoplasmas	LC, S
	Topic 2.2. Morphological features of viruses	LC, S
	Topic 2.3. Morphological features of viroids	LC, S
	Topic 2.4. Morphological features of phytoplasmas	LC, S
	Topic 2.5. Biological features of viruses, viroids and phytoplasmas.	LC, S
Module 3: Diagnostic methods for viruses, viroids and phytoplasmas	Topic 3.1. Classical methods of detecting viral infections	LC, S
	Topic 3.2. Enzyme immunoassay	LC, S
	Topic 3.3. Molecular genetic diagnostic methods	LC, S
Module 4: Viruses, viroids and phytoplasmas are pathogens of nightshade crops. Diagnostics and control measures	Topic 4.1. Especially dangerous pathogens of tomato diseases	LC, S
	Topic 4.2. Especially dangerous pathogens of potato diseases	LC, S
Module 5: Viruses, viroids and phytoplasmas are pathogens of cereal crops. Diagnostics and control measures	Topic 5.1. Especially dangerous pathogens of wheat diseases	LC, S
	Topic 5.2. Especially dangerous pathogens of rice diseases	LC, S
	Topic 5.3. Especially dangerous pathogens of corn diseases	LC, S
Module 6: Viruses, viroids and phytoplasmas are pathogens of fruit and	Topic 6.1. Especially dangerous pathogens of stone crops	LC, S
	Topic 6.2. Especially dangerous pathogens of seed	LC, S

Course module title	Course module contents (topics)	Academic activities types
berry crops. Diagnostics and control measures	crops	
	Topic 6.3. Especially dangerous pathogens of strawberry diseases	LC, S
	Topic 6.4. Especially dangerous pathogens of raspberries and other berry crops	LC, S
	Topic 6.5. Especially dangerous pathogens of grape diseases	LC, S
	Topic 6.6. Certification of planting material.	LC, S

* - 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	A lecture hall for lecture-type classes, equipped with a set of specialized furniture; board (screen) and technical means of multimedia presentations.	A set of specialized furniture; technical means: Interactive complex – Triumph Board interactive whiteboard with Optoma projector
Seminar	A classroom for conducting seminars, group and individual consultations, current and mid-term assessment; equipped with a set of specialized furniture and technical means for multimedia presentations.	A set of specialized furniture, a binocular medical microscope MIKMED-5, microscopic preparations. Technical means: interactive whiteboard
Self-studies	A classroom for independent work of students (can be used for seminars and consultations), equipped with a set of specialised furniture and computers with access to the electronic information and educational environment.	

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

7. RESOURCES RECOMMENDED FOR COURSE STUDY

Main readings:

1. Fields Virology: Emerging Viruses / Peter M. Howley, David M. Knipe. — Wolters Kluwer Health, 2020.
2. Tretyakova, Y.V. Virology. Practicum / Y.V. Tretyakova, M.S. Kalmykova, V.N. Yarygin, V.M. Kalmykov. — 4th ed., ster. — St. Petersburg: Lan, 2023. — 132 p. — ISBN 978-5-507-47971-9. — Text: electronic // Lan: electronic library system. — URL: https://e.lanbook.com/book/335198

Additional readings:

1. Sashenkov, S.A. *Virology: a practical guide* / S.A. Sashenkov, G.V. Ilyin, D.S. Ilyin. — Penza: PGAU, 2022. — 157 p. — Text: electronic // Lan: electronic library system. — URL: https://e.lanbook.com/book/332963
2. Tretyakova, Y.V. *Virology. Practicum* / Y.V. Tretyakova, M.S. Kalmykova, V.N. Yarygin, V.M. Kalmykov. — 4th ed., ster. — St. Petersburg: Lan, 2023. — 132 p. — ISBN 978-5-507-47971-9. — Text: electronic // Lan: electronic library system. — URL: https://e.lanbook.com/book/335198

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 "Znanium": https://znanium.ru/

2.Databases and search engines:

- Sage: https://journals.sagepub.com/
- Springer Nature Link: https://link.springer.com/
- Wiley Journal Database: https://onlinelibrary.wiley.com/
- Scientometric database Lens.org: https://www.lens.org

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

- Lecture course on the discipline "Virology".

* 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.

DEVELOPERS:

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position, department	name and surname

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