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**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

BIOLOGICAL METHOD OF PLANT PROTECTION

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

1. COURSE GOAL(s)

The discipline "Biological Method of Plant Protection" is part of the Master's program "Integrated Plant Protection" under the field of study 35.04.04 "Agronomy" and is studied in the 2nd semester of the 1st year. The discipline is delivered by the Agrobiotechnology Department.

The discipline consists of 6 sections and 8 topics and is aimed at studying the use of natural regulators to control diseases, pests and weeds.

The purpose of mastering the discipline is: It is an introduction to the possibilities and ways of practical use of natural regulators of the development of pest populations, pathogens and weeds.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the discipline "Biological Method of Plant Protection" 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-1.1 Demonstrates knowledge of the main methods of analysis of scientific and production achievements in agronomy; 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-5	Able to carry out feasibility study of projects in professional activity	GPC-5.1 Masters methods of economic analysis and accounting of project indicators in agronomy; GPC-5.2 Analyzes main production and economic indicators of the project in agronomy; GPC-5.3 Develops proposals for improving project efficiency in agronomy;
PC-2	Able to develop methodologies for conducting experiments, master new research methods	PC-2.1 Develops methodologies for conducting experiments; PC-2.2 Applies modern types and methodologies of observations and accounting in field experiments;
PC-3	Able to organize, conduct and analyze the results of experiments (field trials)	PC-3.2 Organizes field experiments to assess the effectiveness of innovative technologies under production conditions;
PC-4	Able to create models of crop cultivation technologies, plant protection systems, and varieties	PC-4.2 Able to identify primary and secondary components of models to accelerate their development; 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-6	Able to provide	PC-6.2 Able to argue the necessity of using plant

Competence code	Competence descriptor	Competence formation indicators (within this course)
	consultations on innovative technologies in agronomy	protection technologies for accelerated development of agricultural enterprises;

3.COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The discipline "Biological Method of Plant Protection" 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 "Biological Method of Plant Protection".

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	Scientific research work; Bacterial Diseases; Information Technology;	Scientific research work; Biotechnology in Plant Protection; Instrumental methods of research; Mathematical Modeling and Design; Plant Quarantine; Virology; Organization of Integrated Plant Protection Systems; Plant immunity;
GPC-4	Able to conduct scientific research, analyze results and prepare reporting documents	Scientific research work; Bacterial Diseases;	Scientific research work; Instrumental methods of research; Mathematical Modeling and Design; Plant Quarantine; Biotechnology in Plant Protection; Virology; Organization of Integrated Plant Protection Systems; Plant immunity; Undergraduate practice/Pre-diploma practice;
GPC-5	Able to carry out feasibility study of projects in professional activity		Management and Marketing; Organization of Integrated Plant Protection Systems;
PC-2	Able to develop methodologies for conducting experiments, master new research methods	Scientific research work; Molecular Methods of Diagnostics**;	Scientific research work; Plant Quarantine; Biotechnology in Plant Protection; Organization of Integrated Plant Protection Systems; Plant immunity; Instrumental methods of research;
PC-3	Able to organize, conduct and analyze the	Scientific research work;	Scientific research work; Mathematical Modeling and

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
	results of experiments (field trials)		Design; Organization of Integrated Plant Protection Systems;
PC-4	Able to create models of crop cultivation technologies, plant protection systems, and varieties	Information Technology;	Organization of Integrated Plant Protection Systems;
PC-6	Able to provide consultations on innovative technologies in agronomy	Pest Risk Analysis**; Forecast of Development of Agricultural Pests and Diseases**; Nematodes**; Bacterial Diseases;	Mathematical Modeling and Design; Organization of Integrated Plant Protection Systems; Plant immunity; Virology;

* 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 "Biological Method of Plant Protection" is 3 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
		2
<i>Contact academic hours</i>	48	48
including:		
Lectures (LC)	24	24
Lab work (LW)	24	24
Seminars (workshops/tutorials) (S)	0	0
<i>Self-studies</i>	52	52
<i>Evaluation and assessment (exam/passing/failing grade)</i>	8	8
Course workload	academic hours	108
	credits	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: The history of the development and	Topic 1.1. The main factors of regulation of the number of harmful organisms	LC, LW

Course module title	Course module contents (topics)	Academic activities types
current state of the biological method of plant protection	Topic 1.2. The ecological foundations of biometrics	LC, LW
Module 2: Entomophages	Topic 2.1. Methods of using entomophages	LC, LW
	Topic 2.2. Trichogramma, Habrobracon, Encarsia, Syrphidae, Rodolia	LC, LW
Module 3: Acariphages	Topic 3.1. Phytoseiulus	LC, LW
Module 4: Phytophages	Topic 4.1. Prospects of use	LC, LW
Module 5: Genetic methods of insect control	Topic 5.1. Sterilization methods. Chemosterilants	LC, LW
Module 6: Production technology and methods for controlling the effectiveness of biological products	Topic 6.1. Biopesticides; biologically active substances in plant protection	LC, 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)
Lecture	A lecture hall for lecture-type classes, equipped with a set of specialized furniture; board (screen) and technical means of multimedia presentations.	Set of specialized furniture; chalkboard
Computer Lab	A computer classroom for conducting classes, group and individual consultations, current and mid-term assessment; equipped with personal computers (16 units), board (screen) and technical means of multimedia presentations	Computer classes; multimedia board, projector, 16 workstations
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. *Plant pathology & diseases.* URI: <https://directory.doabooks.org/handle/20.500.12854/67434> DOI:

10.5772/intechopen.80762 Webshop link: <https://www.intechopen.com/books> ISBN: 9781789851168, 9781789851151, 9781789846980 Publisher: IntechOpen. Publisher website: <https://www.intechopen.com/>. Publication date and place: 2020. Imprint: IntechOpen. Classification: Plant reproduction & propagation. Pages: 240.

2. Sternshis, M.V. *Biological protection of plants: a textbook for universities* / M.V. Sternshis, I.V. Andreeva, O.G. Tomilova. — 7th ed., revised. — St. Petersburg: Lan, 2024. — 332 p. — ISBN 978-5-507-49266-4. — Text: electronic // Lan: electronic library system. — URL: <https://e.lanbook.com/book/384752>

Additional readings:

1. *Biological protection of plants from stress: a textbook for universities* / L.Z. Karimova, V.A. Kolesar, R.I. Safin, G.K. Khuzina. — 3rd ed., revised. — Saint Petersburg: Lan, 2024. — 100 p. — ISBN 978-5-507-49137-7. — Text: electronic // Lan: electronic library system. — URL: <https://e.lanbook.com/book/379346>
2. Belchenko, S.A. *Biological agriculture: a textbook for universities* / S.A. Belchenko, O.V. Melnikova, M.P. Naumova. — Saint Petersburg: Lan, 2025. — 100 p. — ISBN 978-5-507-51687-2. — Text: electronic // Lan: electronic library system. — URL: <https://e.lanbook.com/book/455588>

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 "Znaniy": <https://znaniy.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 "Biological Method of Plant Protection".

* 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:

Professor of the Agrobiotechnology Department

Pakina E. N.

position, department

name and surname

HEAD OF EDUCATIONAL DEPARTMENT:

Director of the Agrobiotechnology Department

Pakina E. N.

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**HEAD
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