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

ORGANIZATION OF INTEGRATED PLANT PROTECTION SYSTEMS

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 "Organization of Integrated Plant Protection Systems" 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 8 topics and is aimed at studying phytosanitary risks, biological, chemical, etc. plant protection methods.

The purpose of mastering the discipline is: building a modern integrated plant protection system and the technology of its implementation.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the discipline "Organization of Integrated Plant Protection Systems" 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)
GC-1	Able to carry out critical analysis of problem situations based on a systematic approach, develop an action strategy	GC-1.1 Performs search for necessary information, its critical analysis and generalizes the results of the analysis to solve the assigned task; GC-1.3 Develops a strategy for achieving the set goal as a sequence of steps, anticipating the result of each of them and assessing their impact on the external environment of the planned activities and on the relationship between the participants in these activities;
GC-2	Able to manage a project at all stages of its life cycle	GC-2.1 Develops a project concept within the defined problem, formulating the goal, objectives, relevance, significance (scientific, practical, methodological, etc., depending on the project type), expected results and possible areas of their application; GC-2.2 Forms a schedule for the implementation of the project as a whole and a plan for monitoring its execution, organizes and coordinates the work of project participants; GC-2.3 Proposes possible ways (algorithms) for implementing the project results into practice (or implements it);
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-1.3 Applies available technologies, including information and communication technologies, to solve professional tasks in agronomy;
GPC-3	Able to use modern methods of solving problems when developing new technologies in professional	GPC-3.1 Analyzes methods and ways of solving problems related to the development of new technologies in agronomy;

Competence code	Competence descriptor	Competence formation indicators (within this course)
	activities	
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;
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-1	Able to collect, process, analyze and systematize scientific and technical information, domestic and foreign experience in the field of agronomy	PC-1.1 Performs critical analysis of the information received;
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-4.3 Carries out the creation of plant protection systems for specific production conditions; PC-4.4 Masters skills in organizing plant protection work adapted to the soil and climatic conditions of the region;
PC-6	Able to provide consultations on innovative technologies in agronomy	PC-6.2 Able to argue the necessity of using plant protection technologies for accelerated development of agricultural enterprises;

3.COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The discipline "Organization of Integrated Plant Protection Systems" 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 "Organization of Integrated Plant Protection Systems".

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*
GC-1	Able to carry out critical analysis of problem situations based on a systematic approach, develop an action strategy	Plant Protection in Organic Farming**; Scientific and Research Practice; Scientific research work;	Biotechnology in Plant Protection; Scientific research work; Undergraduate practice/Pre-diploma practice;
GC-2	Able to manage a project at all stages of its life cycle	Manuscript Design**; History and methodology of scientific Agronomy; Instrumental methods of research; Information Technology; Forecast of Development of Agricultural Pests and Diseases**; Pest Risk Analysis**; Scientific and Research Practice; Scientific research work;	Plant immunity; Biotechnology in Plant Protection; Scientific research work; Undergraduate practice/Pre-diploma practice;
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	Instrumental methods of research; Bacterial Diseases; Information Technology; Biological Method of Plant Protection; Scientific and Research Practice; Scientific research work;	Plant Quarantine; Plant immunity; Biotechnology in Plant Protection; Scientific research work;
GPC-3	Able to use modern methods of solving problems when developing new technologies in professional activities	Instrumental methods of research; Information Technology; Scientific and Research Practice; Scientific research work;	Scientific research work;
GPC-4	Able to conduct scientific research, analyze results and prepare reporting documents	Instrumental methods of research; Bacterial Diseases; Biological Method of Plant Protection; Scientific and Research Practice; Scientific research work;	Plant Quarantine; Plant immunity; Biotechnology in Plant Protection; Scientific research work; Undergraduate practice/Pre-diploma practice;
GPC-5	Able to carry out feasibility study of projects in professional activity	Biological Method of Plant Protection;	Management and Marketing;
PC-1	Able to collect, process, analyze and systematize scientific and technical information, domestic and foreign experience in the field of agronomy	History and methodology of scientific Agronomy; Information Technology; Forecast of Development of Agricultural Pests and Diseases**; Pest Risk Analysis**; Scientific and	Plant Quarantine; Plant immunity; Biotechnology in Plant Protection; Scientific research work; Undergraduate practice/Pre-diploma practice;

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
		Research Practice; Scientific research work;	
PC-2	Able to develop methodologies for conducting experiments, master new research methods	Molecular Methods of Diagnostics**; Instrumental methods of research; Biological Method of Plant Protection; Plant Protection in Organic Farming**; Scientific and Research Practice; Scientific research work;	Plant Quarantine; Plant immunity; Biotechnology in Plant Protection; Scientific research work;
PC-3	Able to organize, conduct and analyze the results of experiments (field trials)	Biological Method of Plant Protection; Scientific and Research Practice; Scientific research work;	Scientific research work;
PC-4	Able to create models of crop cultivation technologies, plant protection systems, and varieties	Scientific and Research Practice; Information Technology; Biological Method of Plant Protection;	
PC-6	Able to provide consultations on innovative technologies in agronomy	Nematodes**; Bacterial Diseases; Weed biology and management**; Biological Method of Plant Protection; Forecast of Development of Agricultural Pests and Diseases**; Pest Risk Analysis**; Plant Protection in Organic Farming**; Scientific and Research Practice;	Plant immunity;

* 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 "Organization of Integrated Plant Protection Systems" is 5 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
		3
Contact academic hours	*51*	*51*
including:		
Lectures (LC)	17	17

Type of academic activities		Total academic hours	Semesters/training modules
			3
Lab work (LW)		0	0
Seminars (workshops/tutorials) (S)		34	34
Self-studies		*101*	*101*
Evaluation and assessment (exam/passing/failing grade)		*28*	*28*
Course workload	academic hours	**180**	180
	credits	**5**	5

* 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 concept of integrated plant protection, the main goals and objectives	Topic 1.1. Theoretical foundations of integrated plant protection.	LC, S
Module 2: Phytopathogenic complex on various crops	Topic 2.1. Intra- and inter-population relations, their dynamics depending on environmental factors and human economic activity.	LC, S
	Topic 2.2. The species composition of pests, diseases and weeds on major crops	LC, S
Module 3: The specifics of agroecosystems	Topic 3.1. The change in the importance of individual environmental factors in the vital activity of phytopathogens.	LC, S
Module 4: Dynamics of pest populations	Topic 4.1. Density-dependent and density-independent factors.	LC, S
Module 5: The main methods of plant protection	Topic 5.1. Agrotechnical method, physical and mechanical methods, resistant varieties, biological method, chemical method, quarantine.	LC, S
	Topic 5.2. The choice of the method and method of protection, the complex use of various methods on individual crops.	LC, S
Module 6:	Topic 6.1. The harmfulness of phytophages.	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	Set of specialized furniture; technical means: EPSON

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
	(screen) and technical means of multimedia presentations.	EB-965 multimedia projector, Laptop, internet access available. Software: Microsoft products (OS, office applications package, including MS Office/Office 365, Teams, Skype)
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.	Set of specialized furniture; technical means: Interactive complex – Triumph Board interactive whiteboard with Optoma projector
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 Protection: From Chemicals to Biologicals / Edited by Ravindra Soni, Deep Chandra Suyal, and Reeta Goel. — De Gruyter, 2022.*
2. *Integrated plant protection / T.V. Dolzhenko, L.E. Kolesnikov, A.G. Semenova [et al.]. — 3rd ed., ster. — St. Petersburg: Lan, 2024. — 120 p. — ISBN 978-5-507-47304-5. — Text: electronic // Lan: electronic library system. — URL: https://e.lanbook.com/book/359825*

Additional readings:

1. *Integrated plant protection in agrophytocenoses: a textbook for universities / V.E. Torikov, O.V. Melnikova, I.V. Sycheva [et al.]; edited by V.E. Torikov. — St. Petersburg: Lan, 2024. — 180 p. — ISBN 978-5-507-48892-6. — Text: electronic // Lan: electronic library system. — URL: https://e.lanbook.com/book/401012*
2. *Integrated plant protection: a textbook / compiled by V.V. Turchin [et al.]. — Persianovsky: Donskoy State Agrarian University, 2022. — 80 p. — Text: electronic // Lan: electronic library system. — URL: https://e.lanbook.com/book/400784*

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 "Organization of Integrated Plant Protection Systems".

* 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.**
name of department	name and surname

HEAD
OF HIGHER EDUCATION PROGRAMME:

Director of the Agrobiotechnology Department	**Pakina E. N.**
position, department	name and surname