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

Agrarian -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

2025

1. COURSE GOAL(s)

The purpose of mastering the discipline "Organization of Integrated Plant Protection Systems" is to build a modern system of integrated plant protection and the technology of its implementation.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the discipline "Organization of Integrated Plant Protection Systems" is aimed at the formation of the following competencies (part of the competencies) among students:

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

Competence code	**Competence descriptor**	**Competence formation indicators** (within this course)
GK-1	Able to carry out search, critical analysis of problem situations on the basis of a systematic approach, to develop an action strategy	GK-1.1. Performs the search for the necessary information, its critical analysis and summarizes the results of the analysis to solve the task
		GK-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 activity and on the relationships of the participants in this activity
GK-2	Able to manage the project at all stages of its life cycle	GK-2.1. Develops the concept of the project within the framework of the designated problem, formulating the goal, objectives, relevance, significance (scientific, practical, methodological and other depending on the type of project), expected results and possible areas of their application.
		GK-2.2. Forms a schedule for the implementation of the project as a whole and a plan for monitoring its implementation, organizes and coordinates the work of project participants
		GK-2.3. Offers possible ways (algorithms) of implementation of the project results into practice (or implements it)
OPK-1	Able to solve the problems of development of the field of professional activity and (or) organization on the basis of analysis of the achievements of science and production	OPK-1.2. Uses methods of solving problems in the development of agronomy based on the search and analysis of modern achievements of science and production
		OPK-1.3. Applies available technologies, including information and communication technologies, to solve the problems of professional activity in agronomy
OPK-3	Able to use modern methods of problem solving in the development of new technologies in professional activities	OPK-3.1. Analyzes methods and methods of solving problems in the development of new technologies in agronomy

Competence code	Competence descriptor	Competence formation indicators (within this course)
OPK-4	Able to conduct research, analyze results and prepare reporting documents	OPK-4.2. Uses information resources, scientific, experimental and instrumental base for research in agronomy
		OPK-4.3. Formulates the results obtained in the course of solving research problems
OPK-5	Able to carry out feasibility studies of projects in professional activities	OPK-5.1. Owns the methods of economic analysis and accounting of project indicators in agronomy
		OPK-5.2. Analyzes the main production and economic indicators of the project in agronomy
		OPK-5.3. Develops proposals to improve the efficiency of the project in agronomy
PK-1	Able to collect, process, analyze and systematize scientific and technical information, domestic and foreign experience in the field of agronomy	PK-1.1. Performs critical analysis of the information received
PK-2	Able to develop methods of conducting experiments, master new research methods	PK-2.1. Develops methods for conducting experiments
		PK-2.2. Applies modern types and methods of observation and accounting in field experiments
PK-3	Able to organize, conduct and analyze the results of experiments (field experiments)	PK-3.2. Organizes field experiments to assess the effectiveness of innovative technologies in production conditions
PK-4	Able to create models of crop cultivation technologies, plant protection systems, varieties	PK-4.2. Able to distinguish the main and secondary components of models in order to accelerate their development
		PK-4.3. Implements the creation of plant protection systems for specific production conditions
		PK-4.4. Has the skills to organize work on plant protection, adapted to the soil and climatic conditions of the region
PK-6	Able to consult on innovative technologies in agronomy	PK-6.2. Able to aggregate the need to use plant protection technologies for accelerated development of agricultural enterprises

3.COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

Mastering the discipline "Organization of Integrated Plant Protection Systems" is aimed at forming the following competencies (part of the competencies) among students:

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*
GK-1	Able to carry out search, critical analysis of problem situations on the basis of a systematic approach, to develop an action strategy	Scientific research work / Научно-исследовательская работа; Research Practice; Plant Protection in Organic Farming;	Scientific research work / Научно-исследовательская работа; Undergraduate practice / Преддипломная практика; Biotechnology in Plant Protection;
GK-2	Able to manage the project at all stages of its life cycle	Manuscript Design; Information Technology; Pest Risk Analysis; Forecast of Development of Agricultural Pests and Diseases; Instrumental methods of research; History and methodology of scientific Agronomy; Scientific research work / Научно-исследовательская работа; Research Practice;	Scientific research work / Научно-исследовательская работа; Undergraduate practice / Преддипломная практика; Biotechnology in Plant Protection; Plant Immunity;
OPK-1	Able to solve the problems of development of the field of professional activity and (or) organization on the basis of analysis of the achievements of science and production	Biological Method of Plant Protection; Instrumental methods of research; Bacterial Diseases; Information Technology: Research Practice; Scientific research work / Научно-исследовательская работа;	Scientific research work / Научно-исследовательская работа; Biotechnology in Plant Protection; Plant Immunity; Plant Quarantine;
OPK-3	Able to use modern methods of problem solving in the development of new technologies in professional activities	Scientific research work / Научно-исследовательская работа; Information Technology: Research Practice; Instrumental methods of research;	Scientific research work / Научно-исследовательская работа;
OPK-4	Able to conduct research, analyze results and prepare reporting documents	Research Practice; Scientific research work / Научно-исследовательская работа; Biological Method of Plant Protection;	Plant Immunity; Plant Quarantine; Scientific research work / Научно-исследовательская работа; Undergraduate practice / Преддипломная практика;

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
		Bacterial Diseases; Instrumental methods of research;	Biotechnology in Plant Protection;
OPK-5	Able to carry out feasibility studies of projects in professional activities	Biotechnology in Plant Protection;	Management and Marketing;
PK-1	Able to collect, process, analyze and systematize scientific and technical information, domestic and foreign experience in the field of agronomy	Scientific research work / Научно-исследовательская работа; Research Practice; Pest Risk Analysis; Forecast of Development of Agricultural Pests and Diseases; History and methodology of scientific Agronomy; Information Technology;	Scientific research work / Научно-исследовательская работа; Biotechnology in Plant Protection; Plant Immunity; Plant Quarantine;
PK-2	Able to develop methods of conducting experiments, master new research methods	Molecular Methods of Diagnostics; Biological Method of Plant Protection; Plant Protection in Organic Farming; Instrumental methods of research; Scientific research work / Научно-исследовательская работа; Research Practice;	Scientific research work / Научно-исследовательская работа; Undergraduate practice / Преддипломная практика; Biotechnology in Plant Protection; Plant Immunity; Plant Quarantine;
PK-3	Able to organize, conduct and analyze the results of experiments (field experiments)	Scientific research work / Научно-исследовательская работа; Research Practice; Biological Method of Plant Protection;	Scientific research work / Научно-исследовательская работа;
PK-4	Able to create models of crop cultivation technologies, plant protection systems, varieties	Research Practice; Biological Method of Plant Protection; Plant Protection in Organic Farming; Pest Risk Analysis; Forecast of Development of Agricultural Pests and Diseases;	Plant Immunity;

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
		Nematodes; Weed biology and management; Bacterial Diseases;	
PK-6	Able to consult on innovative technologies in agronomy	Information Technology; Biological Method of Plant Protection; Research Practice;	

* To be filled in according to the competence matrix of the higher education programme.

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

Possible wording

The total labor intensity of the discipline "Organization of Integrated Plant Protection Systems" is 5 credits for full-time education.

Table 4.1 – Types of educational work by periods of mastering the OP HE for full-time education

Type of academic activities		Total academic hours	Semesters/training modules			
			1	2	3	4
Contact academic hours		*51*			*51*	
including:						
Lectures (LC)		17			17	
Lab work (LW)						
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**	

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. The relationship between plants and phytophages. Climatic factors, edaphic background, anthropogenic factors.	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; the nature of damage.	LC; S

Course module title	Course module contents (topics)	Academic activities types
Module 3: The specifics of agroecosystems	Topic 3.1. The change in the importance of individual environmental factors in the vital activity of phytopathogens. The main patterns of formation of harmful entomofauna. Directions of adaptation of harmful organisms to environmental conditions.	LC; S
Module 4: Dynamics of pest populations	Topic 4.1. Density-dependent and density-independent factors. The main phases in the development of pest and disease populations.	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. Economic thresholds of harmfulness	Topic 6.1. The harmfulness of phytophages. Methods of its assessment, the use of EPW and integrated plant protection.	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 Hall	Auditorium for lecture-type classes, equipped with a set of specialized furniture; whiteboard (screen) and technical means of multimedia presentations.	
Seminary	An auditorium for seminar-type classes, group and individual consultations, ongoing monitoring and intermediate certification, equipped with a set of specialized furniture and multimedia presentation equipment.	
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. - Электронные текстовые данные. - De Gruyter, 2022.URL: https://lib.rudn.ru/MegaPro/UserEntry?Action=Link_FindDoc&id=515568&idb=0

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/

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/

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

The set of lectures on the course «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:

position, department name and surname

position, department | name and surname

position, department | name and surname

HEAD OF EDUCATIONAL DEPARTMENT:

name of department | name and surname

HEAD
OF HIGHER EDUCATION PROGRAMME:

position, department | name and surname