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

Pests and Diseases
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:

General Agriculture
higher education programme profile/specialisation title

2025

1. COURSE GOAL(s)

The purpose of mastering the discipline " Pests and Diseases " is included in the master's degree program "General Agronomy" in the direction of 35.04.04 "Agronomy" and is studied in the 2nd, 3rd semesters of the 1st, 2nd courses. The discipline is implemented by the Agrobiotechnology Department. The discipline consists of 6 sections and 17 topics and is aimed at studying the structure and biology of harmful entomofauna, its role in agriculture, the main groups of pathogens and the features of their pathogenesis.

The purpose of mastering the discipline is to gain basic knowledge about the morphology, physiology, and anatomy of insects. The role of insects in nature and human economic activity. The study of classical and new methods of insect population management. The main types of phytopathogens, features of their development and interaction with the host plant, symptoms of plant diseases. Formation of skills of practical application of acquired knowledge.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the discipline " Pests and Diseases " 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)
GC-1	Able to carry out a critical analysis of problematic situations based on a systematic approach, develop a strategy for action	GC-1.1 Searches for the necessary information, critically analyzes it and summarizes the results of the analysis to solve the task.; GC-1.2 Uses a systematic approach to solve its tasks;
GC-7	Able to search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received to solve problems, evaluate information, its reliability, build logical conclusions based on incoming information and data	GC-7.1 Evaluates information, its reliability, and draws logical conclusions based on incoming information and data; GC-7.2 has practical experience in searching, perceiving, storing, analyzing, and transmitting information and data using digital tools, algorithms, and applications to solve tasks.;
OPK-1	Able to solve the tasks of developing the field of professional activity and (or) organization based on the analysis of scientific and industrial achievements	OPK-1.2 Uses methods to solve the problems of agronomy development based on the search and analysis of modern achievements of science and production; OPK-1.3 Uses available technologies, including information and communication technologies, to solve the tasks of professional activity in agronomy;
OPK-7	Able to master tools for working with large amounts of structured and unstructured information, use modern digital methods of data processing, analysis, interpretation and visualization in order to solve the tasks of professional and research activities in the field of agronomy	OPK-7.2 Uses modern digital methods of data processing, analysis, interpretation and visualization in order to solve the tasks set tasks;

PC-1	Able to organize experiments (field experiments) to evaluate the effectiveness of innovative technologies (technology elements), varieties and hybrids in production conditions	PC-1.1 Develops a research program to study the effectiveness of innovative technologies (technology elements), varieties and hybrids, develops experimental methods, and develops new research methods;
PC-2	Able to develop and implement environmentally friendly techniques and technologies for the production of high-quality crop production, taking into account the properties of agricultural landscapes and economic efficiency	PC-2.2 Organizes quality and safety control of crop production;

3.COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

Mastering the discipline " Pests and Diseases " 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***
GC-1	Able to carry out a critical analysis of problematic situations based on a systematic approach, develop a strategy for action	Information Technology; Information Databases; Soil Fertility Management; Scientific research work / Научно-исследовательская работа;	Soil Fertility Management; Undergraduate practice / Преддипломная практика; Scientific research work / Научно-исследовательская работа;
GC-7	Able to search for the necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received to solve problems, evaluate information, its reliability, build logical conclusions based on	Information Technology; Soil Fertility Management; Crop Production; *Management***; *Marketing***; Scientific research work / Научно-исследовательская работа;	Soil Fertility Management; Postharvest Management; Crop Production; Undergraduate practice / Преддипломная практика; Scientific research work / Научно-исследовательская работа;

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
	incoming information and data		
OPK-1	Able to solve the tasks of developing the field of professional activity and (or) organization based on the analysis of scientific and industrial achievements	Crop Production; Soil Fertility Management; Information Technology; Scientific research work / Научно-исследовательская работа;	Scientific research work / Научно-исследовательская работа; Undergraduate practice / Преддипломная практика; Crop Production; Postharvest Management; Soil Fertility Management;
OPK-7	Able to master tools for working with large amounts of structured and unstructured information, use modern digital methods of data processing, analysis, interpretation and visualization in order to solve the tasks of professional and research activities in the field of agronomy	Information Technology; Scientific research work / Научно-исследовательская работа;	Scientific research work / Научно-исследовательская работа; Undergraduate practice / Преддипломная практика;
PC-1	Able to organize experiments (field experiments) to evaluate the effectiveness of innovative technologies (technology elements), varieties and hybrids in production conditions	Scientific research work / Научно-исследовательская работа; Information Technology; Crop Production; Mechanization of Crop Production; Soil Fertility Management;	Crop Production; Breeding and Seed Production; Soil Fertility Management; Scientific research work / Научно-исследовательская работа; Undergraduate practice / Преддипломная практика;
PC-2	Able to develop and implement environmentally friendly techniques and technologies for the production of high-quality crop production, taking into account the properties of agricultural landscapes and economic efficiency	Crop Production; Scientific research work / Научно-исследовательская работа;	Scientific research work / Научно-исследовательская работа; Crop Production; Breeding and Seed Production;

* 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 " Pests and Diseases " is 7 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		*116*		*48*	*68*	
including:						
Lectures (LC)		58		24	34	
Lab work (LW)						
Seminars (workshops/tutorials) (S)		*58*		24	34	
Self-studies		*90*		*50*	*40*	
Evaluation and assessment (exam/passing/failing grade)		*46*		*10*	*36*	
Course workload	academic hours_	**252**		**108**	**144**	
	credits	**7**		**3**	**4**	

5. COURSE CONTENTS

Table 5.1. Course contents and academic activities types

Course module title	Course module contents (topics)	Academic activities types
Module 1: General entomology	1.1 Subject and history of entomology	LC; S
Module 2: Agricultural entomology	2.1 Subject and history of entomology	LC; S
	2.2 General plan of insect structure	LC; S
	2.3 Anatomy and physiology of insects	LC; S
	2.4 Lower insects and insects with incomplete transformation. General characteristics of the units	LC; S
	2.5 Insects with complete transformation. General characteristics of the units	LC; S
Module 3: General phytopathology	3.1 Viruses and viroids as pathogens of plant diseases. Virosis of agricultural crops	LC; S
	3.2 Bacteria as pathogens of plant diseases. Bacteriosis of agricultural crops	LC; S
	3.3 Lower fungi as plant pathogens	LC; S
Module 4: Agricultural phytopathology	4.1 Higher fungi as pathogens of plant diseases. Mycoses of agricultural crops	LC; S
	4.2 Diseases of grain and leguminous crops	LC; S
	4.3 Diseases of vegetable and fruit crops	LC; S

Course module title	Course module contents (topics)	Academic activities types
Module 5. Methods of control	5.1 Methods of diagnosis of fungal, bacterial and viral plant diseases	LC; S
	5.2 Methods of control of plant diseases	LC; S
	5.3 Methods of control of plant pests	LC; S
Module 6: Methodological section	6.1 Working with the determinant	LC; S
	6.2 Working with electronic databases	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	An auditorium for conducting lecture-type classes, equipped with a set of specialized furniture; a blackboard (screen) and multimedia presentation equipment	
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. Osmolovsky Grigory Evseevich.Entomology / G. N.E. Osmolovsky, N.V. Bondarenko. - 3rd ed., ser. ; Electronic text data. Saint Petersburg : Quadro, 2020. 360 p. (Textbooks and teaching aids for Higher agricultural educational institutions). URL: https://lib.rudn.ru/MegaPro/UserEntry?Action=Link_FindDoc&id=487754&idb=0

2. Kasinkina,O. M. Fruit growing. Diseases and pests of fruit and berry plants: a textbook / O. M. Kasinkina, I. P. Kosheleva. Penza : PGAU, 2022. 143 p. - Text : electronic // lan : electronic library system. - URL: https://e.lanbook.com/book/270977

Additional readings:

1. Zykin, A.V. English for agricultural universities. Protection and quarantine of plants, entomology, phytopathology / A. V. Zykin, N. G. Kovalenko. - Saint Petersburg : Lan, 2023. - 144 p. — ISBN 978-5-507-45410-5. -Text : electronic // lan : electronic library system. - URL: https://e.lanbook.com/book/302420

2. English for students and postgraduates of agronomy: an educational and methodical manual / compiled by E. G. Korotkov, E. Y. Sementovskaya. Novosibirsk : NGAU, 2020. 453 p. - Text : electronic // lan : electronic library system. - URL: https://e.lanbook.com/book/172293

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 « Pests and Diseases »

* 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