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Информация о владельце:  
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Должность: Ректор  
Дата подписания: 28.05.2026 11:58:41  
Уникальный программный ключ:  
ca953a0120d891083f939673078ef1a989dae18a

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

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

## **COURSE SYLLABUS**

### **PESTS AND DISEASES OF PLANTS**

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course title

**Recommended by the Didactic Council for the Education Field of:**

#### **35.04.04 AGRONOMY**

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field of studies / speciality code and title

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

#### **GENERAL AGRICULTURE**

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higher education programme profile/specialisation title

## 1. COURSE GOAL(s)

The course "Pests and Diseases of Plants" is part of the Master's programme "General Agriculture" in the field of study 35.04.04 "Agronomy" and is studied in the 2nd and 3rd semesters of the 1st and 2nd years. 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 disease pathogens, and the features of their pathogenesis.

### The course aims to:

1. Provide students with fundamental knowledge of the morphology, physiology, and anatomy of insects;
2. Familiarize students with the role of insects in nature and in human economic activity;
3. Introduce students to classical and modern methods of managing insect populations;
4. Present the main types of phytopathogens, the features of their development and interaction with the host plant, and symptoms of plant diseases;
5. Develop students' skills in the practical application of acquired knowledge.

The goal of mastering the discipline is to obtain fundamental knowledge about the morphology, physiology, and anatomy of insects; to understand the role of insects in nature and in human economic activity; to study classical and modern methods of managing insect populations; to learn about the main types of phytopathogens, the features of their development and interaction with the host plant, and symptoms of plant diseases; and to develop practical skills in applying the acquired knowledge.

## 2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course "Pests and Diseases of Plants" is aimed at the development of the following competences (or parts thereof) 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-7	Ability to search for necessary information sources and data, perceive, analyze, memorize, and transmit information using digital tools, as well as using algorithms when working with data from various sources to effectively use the obtained information for problem-solving; able to evaluate information and its reliability, and build logical conclusions based on incoming information and data	GC-7.1 Evaluates information and its reliability, builds 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 application software to solve assigned tasks;

<b>Competence code</b>	<b>Competence descriptor</b>	<b>Competence formation indicators (within this course)</b>
GC-1	Ability to carry out critical analysis of problematic situations based on a systemic approach and to develop an action strategy	GC-1.1 Performs search for necessary information, its critical analysis, and summarizes the results of the analysis to solve the assigned task;
		GC-1.2 Uses a systemic approach to solve assigned tasks;
GC-7	Ability to search for necessary information sources and data, perceive, analyze, memorize, and transmit information using digital tools, as well as using algorithms when working with data from various sources to effectively use the obtained information for problem-solving; able to evaluate information and its reliability, and build logical conclusions based on incoming information and data	GC-7.1 Evaluates information and its reliability, builds 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 application software to solve assigned tasks;
GPC-7	Ability to use tools for working with large arrays of structured and unstructured information; use modern digital methods for processing, analyzing, interpreting, and visualizing data to solve assigned tasks in professional and research activities in the field of agronomy	GPC-7.2 Uses modern digital methods for processing, analyzing, interpreting, and visualizing data to solve assigned tasks;
PC-1	Ability to organize experiments (field trials) to assess the effectiveness of innovative technologies (technology elements), varieties, and hybrids under production conditions	PC-1.1 Develops a research program to study the effectiveness of innovative technologies (technology elements), varieties, and hybrids; develops methodologies for conducting experiments; masters new research methods;
PC-2	Ability to develop and implement environmentally safe practices and technologies for producing high-quality crop production, taking into account the properties of agro-landscapes and economic efficiency	PC-2.2 Organizes quality control and safety assurance of crop production;

### 3.COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course refers to the **core** component of Block 1 "Disciplines (Modules)" of the higher educational programme curriculum.

Within the higher education programme, students also master other disciplines and/or internships that contribute to the achievement of the expected learning outcomes as results of the course study.

*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*

<b>Competence code</b>	<b>Competence descriptor</b>	<b>Previous courses/modules*</b>	<b>Subsequent courses/modules*</b>
GC-7	Ability to search for necessary information sources and data, perceive, analyze, memorize, and transmit information using digital tools, as well as using algorithms when working with data from various sources to effectively use the obtained information for problem-solving; able to evaluate information and its reliability, and build logical conclusions based on incoming information and data	Information Technology; Pests and Diseases; Information Databases; Soil Fertility Management; Scientific Research Work	Soil Fertility Management; Scientific Research Work; Undergraduate Practice / Pre-graduation Practice
GC-1	Ability to carry out critical analysis of problematic situations based on a systemic approach and to develop an action strategy	Information Technology; Soil Fertility Management; Crop Production; Management; Marketing; Scientific Research Work	Undergraduate Practice / Pre-graduation Practice; Scientific Research Work; Soil Fertility Management; Postharvest Management; Crop Production
GPC-1	Ability to use tools for working with large arrays of structured and unstructured information; use modern digital methods for processing, analyzing, interpreting, and visualizing data to solve assigned tasks in professional and research activities in the	Scientific Research Work; Information Technology	Scientific Research Work; Undergraduate Practice / Pre-graduation Practice

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
	field of agronomy		
PC-1	Ability to organize experiments (field trials) to assess the effectiveness of innovative technologies (technology elements), varieties, and hybrids under production conditions	Information Technology; Crop Production; Mechanization of Crop Production; Soil Fertility Management; Scientific Research Work	Scientific Research Work; Undergraduate Practice / Pre-graduation Practice; Crop Production; Breeding and Seed Production; Soil Fertility Management
PC-2	Ability to develop and implement environmentally safe practices and technologies for producing high-quality crop production, taking into account the properties of agro-landscapes and economic efficiency	Scientific Research Work; Crop Production	Crop Production; Breeding and Seed Production; Scientific Research Work

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

#### 4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the course "Pests and Diseases of Plants" amounts to 7 credits (252 academic hours).

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	3	
<i>Contact academic hours</i>	116	48	68	
including:				
Lectures (LC)	58	24	34	
Lab work (LW)	0	0	0	
Seminars (workshops/tutorials) (S)	58	24	34	
<i>Self-studies</i>	90	50	40	
<i>Evaluation and assessment (exam/passing/failing grade)</i>	46	10	36	
<b>Course workload</b>	academic hours	<b>252</b>	<b>108</b>	<b>144</b>
	credits	<b>7</b>	<b>3</b>	<b>4</b>

\* 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: General Entomology	Topic 1.1. General Entomology	LC, S
Module 2: Agricultural Entomology	Topic 2.1. Agricultural Entomology	LC, S
	Topic 2.2. General plan of insect structure	LC, S
	Topic 2.3. Anatomy and physiology of insects	LC, S
	Topic 2.4. Lower insects and insects with incomplete metamorphosis	LC, S
	Topic 2.5. Insects with complete metamorphosis	LC, S
Module 3: General Phytopathology	Topic 3.1. Viruses and viroids as causative agents of plant diseases	LC, S
	Topic 3.2. Bacteria as causative agents of plant diseases	LC, S
	Topic 3.3. Lower fungi as causative agents of plant diseases	LC, S
Module 4: Agricultural Phytopathology	Topic 4.1. Higher fungi as causative agents of plant diseases	LC, S
	Topic 4.2. Diseases of cereal and grain legume crops	LC, S
	Topic 4.3. Diseases of vegetable and fruit crops	LC, S
Module 5: Control Methods	Topic 5.1. Diagnostic methods	LC, S
	Topic 5.2. Methods for controlling plant diseases	LC, S
	Topic 5.3. Methods for controlling plant pests	LC, S
Module 6: Methodological Section	Topic 6.1. Working with identification keys	LC, S
	Topic 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	A lecture hall for lecture-type classes, equipped with a set of specialised furniture; board (screen) and technical means of multimedia presentations.	Set of specialised furniture; technical facilities: Interactive complex – Triumph Board interactive

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
		whiteboard with Optoma projector
Seminar	A classroom for conducting seminars, group and individual consultations, current and mid-term assessment; equipped with a set of specialised furniture and technical means for multimedia presentations.	Set of specialised furniture, MIKMED-5 binocular medical microscope, microscopic preparations. Technical facilities: 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. Osmolovsky, G. E. Entomology / G. E. Osmolovsky, N. V. Bondarenko. — 3rd ed., ster. — Saint Petersburg: Kvadro, 2020. — 360 p.: ill. — (Textbooks and teaching aids for higher agricultural educational institutions). — URL: [https://lib.rudn.ru/MegaPro/UserEntry?Action=Link\\_FindDoc&id=487754&idb=0](https://lib.rudn.ru/MegaPro/UserEntry?Action=Link_FindDoc&id=487754&idb=0)

2. Kasyankina, O. M. Fruit Growing. Diseases and Pests of Fruit and Berry Plants: teaching aid / O. M. Kasyankina, I. P. Koshelyaeva. — Penza: PGAU, 2022. — 143 p. — Electronic text // Lan: electronic library system. — URL: <https://e.lanbook.com/book/270977> (accessed: 17.03.2025). — Access mode: for authorized users.

### *Additional readings:*

1. Zykin, A. V. English for Agricultural Universities. Plant Protection and Quarantine, Entomology, Phytopathology / A. V. Zykin, N. G. Kovalenko. — Saint Petersburg: Lan, 2023. — 144 p. — ISBN 978-5-507-45410-5. — Electronic text // Lan: electronic library system. — URL: <https://e.lanbook.com/book/302420>

2. English for Students and Postgraduates of Agronomy: teaching aid / compilers E. G. Korotkikh, E. Yu. Sementovskaya. — Novosibirsk: NSAU, 2020. — 453 p. — Electronic text // Lan: electronic library system. — URL: <https://e.lanbook.com/book/172293> (accessed: 17.03.2025). — Access mode: for authorized users.

### *Internet sources*

1. **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): <https://mega.rudn.ru/MegaPro/Web>
- EL "University Library Online": <http://www.biblioclub.ru>

- EL "Yurait": <http://www.biblio-online.ru>
  - EL "Student Consultant": [www.studentlibrary.ru](http://www.studentlibrary.ru)
  - 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/>
  - Bibliometric database Lens.org: <https://www.lens.org>

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

1. The set of lectures on the course "Pests and Diseases of Plants".

\* 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, Agrobiotechnology Department

Pakina E. N.

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position, department

name and surname

**HEAD OF EDUCATIONAL DEPARTMENT:**

Director, Agrobiotechnology Department

Pakina E. N.

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name of department

name and surname

**HEAD  
OF HIGHER EDUCATION PROGRAMME:**

Director, Agrobiotechnology Department

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