

NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL  
SCIENCES OF UKRAINE

V.F. Peresyphkin Department of Phytopathology

"APPROVED"  
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Dean of the Faculty

Plant Protection,

Biotechnologies and Ecology

 Yulia KOLOMIETS

"23" may 2024

"APPROVED"

V.F. Peresyphkin Department of Phytopathology

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Head of the Department

 Dmytro GENTOSH

"REVIEWED"

Guarantor of the AP Plant Protection and Quarant

 Myroslav PIKOVSKYI

CURRICULUM OF ACADEMIC DISCIPLINE

**"Agricultural Plant Pathology"**

Field of knowledge 20 Agricultural sciences and food

Specialty 202 Plant Protection and Quarantine

Academic programme Plant Protection and Quarantine

Faculty Plant Protection, Biotechnologies and Ecology

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## Description of the discipline “Agricultural Plant Pathology”

<b>Academic degree, specialty, academic programme</b>		
Academic degree	bachelor's	
Specialty	202 Plant Protection and Quarantine	
Academic programme	Plant Protection and Quarantine	
<b>Characteristics of the discipline</b>		
Type	compulsory	
Total number of hours	240	
Number of ECTS credits	8	
Number of modules	4	
Course project (work) (if any)	CW	
Form of assessment	exam / credit	
<b>Indicators of the discipline for full-time and part-time forms of university study</b>		
	Full-time	Part-time
Year of study	4	5
Semester	7,8	8,9
Lectures	60 h.	4 h.
Practical classes and seminars	-	-
Laboratory classes	90 h.	-
Self-study	90 h.	236 h.
Number of hours per week for full-time students	6 h.	

### 1. Aim, objectives, competences and expected learning outcomes of the discipline

The purpose of the discipline "Agricultural Plant Pathology" is to study diseases of agricultural crops, the species composition of pathogens and areas of their harmfulness, diagnostic signs of the manifestation of diseases on various plant organs, the influence of biotic and abiotic factors of the environment on the development of pathologies, sources and places of reservation of infection, measures to protect against certain diseases and systems of measures against diseases of a specific culture.

**Task:** studying the spread, symptoms, and harmfulness of diseases of the following groups of crops: grain cereals, grain legumes, annual and perennial leguminous grasses, sorghum, oilseeds, root crops, tubers, vegetables, fruits, berries, and grapes;

Study of the species composition of pathogens of various agricultural crops, their morphological and biological features;

Study of the influence of biotic and abiotic environmental factors on the development of plant diseases;

Clarification of sources and places of reservation of infectious material of pathogens;

Development and substantiation of preventive and therapeutic measures at a high professional level.

As a result of studying the academic discipline, the student should

**to know:** tasks, goals and objects of agricultural phytopathology; diagnostic signs of diseases on agricultural crops; morphological, biological and ecological features of pathogens; places of reservation and storage of infection; areas of spread of diseases and the extent of crop losses of agricultural plants; substantiation of protective measures against diseases on each agricultural crop;

**to be able to:** independently determine the most common and harmful diseases of various etiologies on agricultural crops by diagnostic signs; to identify the causative agents of diseases by morphological signs; to predict the development of diseases depending on weather conditions; plan and carry out agrotechnical, seed selection, chemical and biological plant protection measures; justify the expediency of using chemical and biological means of plant protection against diseases depending on the phytosanitary state of crops; to select and introduce regional disease-resistant varieties and hybrids of agricultural crops for the conditions of a specific farm.

### ***Competence acquisition:***

#### ***Integral competence:***

The ability to solve complex specialized tasks and practical problems of professional activity in plant protection and quarantine and applied theoretical knowledge and methods of phytosanitary monitoring, inspection, analysis, expertise, characterized by complexity and uncertainty of conditions.

#### ***general competences (GC):***

GC 2. Ability to apply knowledge in practical situations.

GC 3. Knowledge and understanding of the subject area and understanding of professional activity.

GC 9. Ability to make informed decisions.

#### ***professional (special) competences (PC):***

PC 1. The ability to carry out phytosanitary diagnostics of plant diseases, insects, mites, nematodes, rodents and weeds according to the latest principles and methods.

PC 5. Ability to develop and apply plant protection technologies at agricultural and other facilities.

PC 7. The ability to coordinate phytosanitary monitoring for the detection, identification and determination of the features of the biology and ecology of harmful organisms in Ukraine and in accordance with the WTO SPS agreement and the provisions of the legislation of the European Union.

*PC 8.* The ability to comprehensively apply methods for long-term regulation, development and spread of harmful organisms to an economically insignificant level based on the forecast, economic thresholds of harmfulness, the effectiveness of beneficial organisms, energy-saving and environmental protection technologies that ensure reliable protection of plants and ecological safety of the environment in accordance with the agreement WTO SPZ and provisions of legislation of the European Union.

*PC 11.* The ability to establish patterns of distribution and development of harmful organisms, to assess their seasonal and multi-year dynamics, to develop, scientifically justify and adapt a set of highly effective pest, disease and weed control measures under various environmental conditions.

***program learning outcomes (PLO):***

*PLO 6.* Correctly use appropriate methods of observation, description, identification, classification, cultivation of objects of agrobiocenoses and maintenance of their stability in order to preserve natural diversity.

*PLO 7.* Have basic knowledge of the basics of genetics, breeding and seed production, microbiology, plant physiology, ecology, soil science, agrochemistry, agriculture, crop production with the basics of fodder production to the extent necessary for mastering general and specialized professional disciplines

*PLO 10.* To train, control and evaluate the professional skills of workers involved in the implementation of plant protection and quarantine measures.

## 2. The program and structure of the academic discipline for:

- full-time full-time (correspondence) form of education;
- reduced period of full-time (correspondence) education.

Titles of modules and themes	Amount of hours											
	total	Full time					total	External				
		including						including				
		l	p	lab	ind	Ind iv. w.		l	p	lab	ind	In di v. w.
1	2	3	4	5	6	7	8	9	10	11	12	13
<b>Content module 1. Diseases of grain and leguminous crops</b>												
Topic 1. Wheat protection system against diseases.	8	3		4	-	1		2				
Topic 2. Barley protection system against diseases.	5	2		2		1						
Topic 3. Rye diseases and the system of measures for their control	4	-	-	1		3						
Topic 4. Oat diseases and the system of measures to control them	4	-	-	1	-	3						
Topic 5. Corn protection system against diseases.	5	2		2		1						
Topic 6. Rice diseases and the system of their control measures	4	-	-	1	-	3						
Topic 7. Millet diseases and the system of measures to control them	4					4						
Topic 8. Buckwheat diseases and the system of measures to control them	2					2						
Topic 9. Diseases of sorghum, sudanka and cereal grasses. System of their control measures.	3	1				2						
Topic 10. Pea diseases and the system of measures to control them	7	2		2		3						
Topic 11. Soybean diseases and the system of measures to control them	5	2		2		2						
Topic 12. Diseases of beans, fodder beans, lupine and vetch. System of their control measures	4	1		1		2						
Topic 13. Diseases of perennial legumes	3					3						
<b>Together according to the content module 1</b>	<b>60</b>	<b>16</b>		<b>15</b>		<b>30</b>						

<b>Content module II. Diseases of industrial crops</b>											
Topic 1. Sunflower diseases and the system of measures to control their development.	8	2		3		3					
Topic 2. Hemp diseases and measures to limit their development	6	1		1		5					
Topic 3. Flax diseases and measures to limit their development	7	1		1		6					
Topic 4. Diseases of castor beans and measures to limit their development	4	1				4					
Topic 5. Rapeseed diseases and measures to limit their development	8	2		2		4					
Topic 6. Tobacco and shaggy diseases. A system of measures to limit their development	7	2		2		5					
Topic 7. Hop diseases and measures to limit their development	6	1		2		4					
Topic 8. Beet diseases and measures to limit their development	10	3		4		4					
<b>Together according to the content module II</b>	<b>61</b>	<b>13</b>		<b>15</b>		<b>35</b>					
<b>Course work</b>											
<b>Credit</b>											
<b>Content module III. Diseases of potatoes and vegetable crops</b>											
Topic 1. Potato diseases and the system of their control measures	11	3		4		5					
Topic 2. Diseases of tomatoes and the system of their control measures	9	3		2		4					
Topic 3. Diseases of cabbage vegetable crops and the system of measures for their control	8	2		2		4					
Topic 4. Onion and garlic diseases and the system of measures to control them	7	2		2		3					
Topic 5. Carrot diseases and the system of their control measures	7	2		2		3					
Topic 6. Diseases of pumpkin crops and the system of measures to control them	8	2		2		4					
Topic 7. Diseases of greens and the system of measures to control them	8	2		1		4					
<b>Together according to the content module III</b>	<b>58</b>	<b>16</b>		<b>15</b>		<b>27</b>					

<b>Content module IV. Diseases of fruit and berry crops and grapes</b>											
Topic 1. Diseases of seed fruit crops and the system of measures for their control	10	3		3		4					
Topic 2. Diseases of stone fruit crops and the system of their control measures	9	2		3		4					
Topic 3. Strawberry diseases and the system of measures to control them	8	2		3		4					
Topic 4. Currant and Gooseberry diseases and the system of measures for their control	7	2		1		4					
Topic 5. Raspberry and blueberry diseases and the system of their control measures	8	2		2		4					
Topic 6. Diseases of grapes and the system of their control measures	9	2		3		4					
Topic 7. Diseases of nuts and the system of their control measures	7	2		1		4					
<b>Together according to the content module IV</b>	<b>58</b>	<b>15</b>		<b>15</b>		<b>28</b>					
<b>Total hours</b>	<b>240</b>	<b>60</b>		<b>60</b>		<b>120</b>					
<b>Course work</b>	15										

### 3. Topics of laboratory classes

No	Topic name	Hours
1.	Powdery mildew diseases of wheat	2
2.	Rusty diseases and root rot of wheat	2
3.	Other diseases of wheat	2
4.	Diseases of barley	2
5.	Rye and oat diseases	2
6.	Diseases of soybeans	2
7.	Diseases of peas	2
8.	Diseases of clover and alfalfa	2
9.	Sunflower diseases	2
10.	Flax diseases	2
11.	Rapeseed diseases	2
12.	Tobacco and pure tobacco diseases	2
13.	Diseases of hops	2
14.	Diseases of sugar beets	2
15.	Diseases of sugar beet roots	2
16.	Potato diseases	2
17.	Diseases of tomatoes	2
18.	Diseases of cabbage	2
19.	Diseases of onions and garlic	3

20.	Carrot diseases	2
21.	Cucumber diseases	2
22.	Diseases of green vegetables	2
23.	Diseases of seed fruit crops	3
24.	Diseases of stone fruit crops	2
25.	Strawberry diseases	2
26.	Currant diseases	2
27.	Raspberry diseases	2
28.	Blueberry diseases	2
29.	Diseases of grapes	3
30.	Diseases of walnut and hazelnut	2

#### 4. Topics of independent work

№	Topic name	Hours
1.	Oat protection system against diseases	2
2.	Rye protection system against diseases	2
3.	Rice diseases and the system of cultural protection measures	4
4.	Diseases of millet and the system of cultural protection measures	2
5.	Buckwheat diseases and the system of cultural protection measures	4
6.	Cereal grass diseases. Systems of protection measures	4
7.	Chickpea diseases. System of protection measures	2
8.	Diseases of beans. System of protection measures	4
9.	Diseases of fodder beans. Systems of protection measures	2
10.	Lupine diseases. System of protection measures	2
11.	Diseases of lentils and vetches. System of protection measures	2
12.	Systems of measures to protect clover and alfalfa from diseases	2
13.	Diseases of sainfoin. System of protection measures	2
14.	Flax protection system against diseases	9
15.	Disease protection system for tobacco and shag	9
16.	System of protection of hops from diseases	8
17.	Hemp diseases and protection system	9
18.	System of measures to protect cabbage vegetable crops from diseases	3
19.	A system of measures to protect onions and garlic from diseases	3
20.	System of measures to protect district crops from diseases	3
21.	System of measures to protect pumpkin crops from diseases	3
22.	System of measures to protect green vegetable crops from	4



	diseases	
23.	System of strawberry disease control measures	3
24.	Currant disease control measures system	2
25.	Gooseberry diseases and the system of protection measures	2
26.	System of raspberry disease control measures	3
27.	A system of measures to protect walnuts from diseases	3
28.	A system of measures to protect hazelnuts from diseases	3

**5. Tools for assessing expected learning outcomes:  
(select necessary or add)**

- exam;
- credit;
- module tests;
- abstracts;
- presentation of laboratory and practical works;
- other types.

**6. Teaching methods:**

- verbal method (lecture, discussion);
- practical method (laboratory, practical classes);
- visual method (illustration, demonstration);
- processing learning resources (note-taking, summarising, reviewing, writing an abstract);
- video method (remote, multimedia, web-based, etc.);
- self-study (completing assignments);
- individual research work;
- other types.

**7. Assessment methods:**

*(select necessary or add)*

- exam;
- credit;
- oral or written assessment;
- module tests;
- team projects;
- presentation of laboratory and practical works;
- presentations at academic events
- other types.

**8. Distribution of points received by students**

The student's knowledge is assessed on a 100-point scale and translated into national assessments according to the table. 1 "Regulations on examinations and assessments at NUBiP of Ukraine" (order on implementation dated 04.26.2023, protocol No. 10)

Student's rating, points	National grading of exams and credits	
	exams	credits
90-100	excellent	pass
74-89	good	
60-73	satisfactorily	
0-59	unsatisfactorily	fail

To determine a student's rating in the discipline **RDIS** (up to 100 points), the received assessment rating **RA** (up to 30 points) is added to the academic performance rating **RAP** (up to 70 points): **RDIS = RAP + RA**.

## 9. Teaching and learning aids

- e-learning course of the discipline (<https://elearn.nubip.edu.ua/course/view.php?id=3039>);
- lectures and presentations (in electronic form);
- textbooks, manuals, tutorials;
- guidelines for studying a discipline by full-time and part-time students;
- internship programmes of the discipline (if included in the curriculum).

## 10. Educational and methodological support

Electronic educational course Agricultural phytopathology / Pikovsky M.Y., website: URL:

<https://elearn.nubip.edu.ua/course/view.php?id=3049>

### 1. Workbook for conducting laboratory work on the discipline

"Agricultural Phytopathology" for students of the specialty 202-protection and quarantine of plants. Part 1. Diseased legumes, legumes and industrial crops

/ editor: M.Y. Pikovsky, M.M. Kirik Kyiv: Editorial and Publishing Department of NUBiP of Ukraine, 2018. 183 p.  
<http://dspace.nubip.edu.ua:8080/jspui/handle/123456789/6069>

2. Workbook for conducting laboratory work of the discipline "Agricultural Phytopathology" for students of the specialty 202-plant protection and quarantine. Part 2. Diseases of vegetable, fruit and berry crops and grapes / comp. M.Y. Pikovsky. Kyiv: Editorial and Publishing Department of NUBiP of Ukraine, 2019. 124 p.  
<http://dspace.nubip.edu.ua:8080/jspui/handle/123456789/6395>

3. Agricultural phytopathology. Methodical instructions for course work by students of the BA "Bachelor" specialty 202 "Protection and quarantine of plants" / comp.: M.Y. Pikovsky, D.T. Gentosh, N.M. Voloshchuk Kyiv: "CP KOMPRINT", 2022. 45 p.

4. Methodical recommendations for independent work on the discipline "Agricultural phytopathology" for first (bachelor's) students level of higher education, specialty 202 Protection and quarantine of plants / comp.: M.Y. Pikovsky. Kyiv: Editorial and publishing department of NUBiP of Ukraine, 2023. 96 p.

5. Kolodiychuk V. D., Kryvenko A. I., Shushkivska N. I. Workshop on agricultural phytopathology: study guide. Kyiv: Center for Educational Literature, 2020. 232 p.

6. Complex systems of protection of agricultural crops from diseases: Education. manual / Turenko V.P., Bilyk M.O., Kuleshov A.V. and others; under the editorship V. P. Turenko, M. O. Bilyka; HNAU named after VV Dokuchaeva. Kind. 2nd, add. Kharkiv: Maidan, 2019. 330 p.

7. List of pesticides and agrochemicals permitted for use in Ukraine /edited by V.U. Yashchuk. Kyiv: UnivestMedia, 2023. 1023 p.

8. Agricultural phytopathology: a textbook / I. L. Markov and others; under the editorship I. L. Markov. Kyiv: Interservice, 2017. 573 p.

### **Internet resources:**

1. Educational and informational portal of the National University of Bioresources and Nature Management of Ukraine: website. URL: <https://elearn.nubip.edu.ua>

2. Journal. Quarantine and plant protection : website. URL: [http://archive.nbu.gov.ua/Portal/chem\\_biol/Kizr/](http://archive.nbu.gov.ua/Portal/chem_biol/Kizr/)

3. Journal. European Journal of Plant Pathology : website. URL: <https://www.springer.com/journal/10658>

4. European and Mediterranean Organization for Plant Protection. European and Mediterranean Plant Protection Organization : website. URL: <https://www.eppo.int/>

5. National Scientific Agricultural Library of the National Academy of Agricultural Sciences: website. URL: <https://dns.gb.com.ua>

6. Scientific library of the National University of Bioresources and Nature Management of Ukraine: website. URL: <https://nubip.edu.ua/structure/library>

7. Periodically harmful and potentially dangerous hazelnut diseases and their prevention: website. URL: <https://www.pro-of.com.ua/periodichno-shkidlyvi-ta-potencijno-nebezpechni-xvorobi-funduka-ta-ix-profilaktika/>

8. Blueberry diseases: website. URL: <https://content.ces.ncsu.edu/leaf-diseases-of-blueberry>

9. State Production and Consumer Service. Plant protection : website. URL: <https://dpss.gov.ua/fitosanitaria-kontrol-u-sferi-nasinnictva-tarozsadnictva/fitosanitrij-kontrol/fitosanitrij-monitoring>

10. Ministry of Environmental Protection and Natural Resources of Ukraine. State register of pesticides and agrochemicals approved for use in Ukraine: website. URL: <https://mepr.gov.ua/upravlinnya-vidhodamy/derzhavnyj-reyestr-pestytsydiv-i-agrohimiaktiv-dozvolenyh-do-vykorystannya-v-ukrayini/>

11. Official site of the Syngenta company: website. URL: <https://www.syngenta.ua/products/search/crop-protection>

12. AgroMage: website. URL: <https://agromage.com>