



SYLLABUS OF AN ACADEMIC DISCIPLINE «General plant pathology»

Academic degree - Bachelor's
Specialty **202 Plant Protection and Quarantine**
Academic programme **Plant Protection and Quarantine**

Year of study **3**, semester **5/6**
Form of study **full-time, part-time**
Number of ECTS credits **8**
Language(s) of instruction **English**

Lecturer of the discipline
Lecturer's contact
information (e-mail)
URL of the e-learning
course on the NULES e-
learning portal

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<https://elearn.nubip.edu.ua/course/view.php?id=3039>

ACADEMIC DISCIPLINE DESCRIPTION

"General plant pathology" is one of the main profiling disciplines in training a specialist in plant protection and quarantine. It has a close connection with many general biological and special disciplines: botany, plant physiology, microbiology, virology, biotechnology, soil science, general agriculture, plant breeding, selection and seed production, fruit growing, vegetable growing, agrochemistry, mycology, agricultural phytopathology, zoology, general and agricultural entomology, etc., due to common objects and research methods.

The goal of general phytopathology as a science is to study the pathological process of plants, the etiology of diseases, the role of biotic and abiotic factors in their appearance and development, and to find out the factors that restrain the spread of pathogens and the diseases they cause.

During the implementation of the program, students study various groups of microorganisms pathogenic to plants, their parasitic properties, specialization and systematic position.

The task of general phytopathology is:

- To acquaint students with the pathological process in a plant,
- To study the reasons for the regularity of the spread and development of plant diseases and to be able to establish the influence of environmental factors on these phenomena
- Master the classic and modern methods of diagnosing plant diseases with subsequent identification of their causative agents;
- Based on signs of manifestations on the plant, establish the etiology of the disease;
- Be able to plan and develop preventive and curative measures to prevent plant diseases and reduce crop losses from diseases

As a result of studying general phytopathology, the student should:

to know the diagnostic signs and types of diseases, methods of identification of pathogens, having mastered the theoretical issues of their biology, ecology, systematics and ways of spreading;

to be able to independently determine the types of diseases, establish their causative agents and taxonomic groups, justify measures that prevent the appearance of epiphytotia and limit the development of diseases caused by them.

Competence acquisition:

Integral competence (IC):

The ability to solve complex specialized tasks and practical problems of professional activity in plant protection and quarantine and to apply 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.

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 16. Know the main historical stages of development of the subject area.

ACADEMIC DISCIPLINE STRUCTURE

Topic	Hours (lectures / laborator y)	Learning outcomes	Tasks	Assesse ment
1.1. The history of the development of phytopathology	4/-	As a result of studying general phytopathology, the student should: to know the diagnostic signs and types of diseases, methods of identification of pathogens, having mastered the theoretical issues of their biology, ecology, systematics and ways of spreading; to be able to independently determine the types of diseases, establish their causative agents and taxonomic groups, justify measures that prevent the appearance of epiphytotia and	<i>Preparation for lectures</i> (preliminary familiarization with the presentation and full-text lecture and its appendices and cited sources of literature in eLearn). Completion and submission of laboratory work (in	3
1.2. Pathological process and its variability	1/2			3
1.3. Harmfulness of plant diseases	1/2			3
1.4. Classification of plant diseases	1/4			3
1.5. Types of plant diseases	1/4			3
1.6. Non-infectious plant diseases	4/4	limit the development of diseases caused by them.	methodological recommendations - during the practical session and independently - in eLearn). <i>Performing independent work</i> (tasks in	5
1.7. Infectious diseases	4/4			5
2.1. Properties of pathogens that determine disease-causing processes in plants	2/2	eLearn). Preparation and writing of the test (descriptive part in the form of a written/oral answer - in		2
2.2. Bacteria and actinomycetes, mycoplasmas and rickettsia	2/4			2
2.3. Viruses and viroids	2/4			2

2.4. Flower parasites	2/2	classroom classes and/or test - in eLearn)	2	
2.5. Morphological, biological and pathogenic properties of lower fungi, their taxonomy.	6/12		2	
3.1. Morphological, biological and pathogenic properties of higher fungi, their taxonomy	12/12		5	
3.2. Penetration of pathogens into the plant	2/4		5	
3.3. The influence of environmental conditions on infection	2/4		5	
3.4. Ways and methods of spread of the infectious beginning	2/2		5	
3.5. The concept of areas and epiphytotypic diseases	2/2		5	
4.1. Methods of diagnosing plant diseases. Molecular diagnostic methods.	2/14		5	
4.2. Methods and means of protecting plants from diseases	8/8		5	
4.2.1. Compliance with agrotechnical requirements for growing plants	1/1			
4.2.2. Immunological method of plant	1/1			
Total for semester				70
Examination				30
Total for the course				100

ASSESSMENT POLICY

<i>Deadlines and exam retaking policy:</i>	Practical/laboratory, independent work and/or control survey must be submitted in the scheduled time before the end of the study of current topics. Violation of the submission deadlines without a good reason gives the teacher the right to lower the grade. The rescheduling of the appropriate type of knowledge control takes place in the presence of good reasons (for example, sick leave) and is allowed until the end of the discipline course.
<i>Academic integrity policy:</i>	Writing, using mobile devices and additional literature during the relevant type of knowledge control and exam is strictly prohibited.
<i>Attendance policy:</i>	Attendance at lectures and practical/laboratory classes is mandatory for all applicants. Lateness to classes is not allowed. For objective reasons (for example, illness, international internship), training may take place according to an individual curriculum approved in a specified manner.

SCALE FOR ASSESSING STUDENTS 'KNOWLEDGE AND SKILLS

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

RECOMMENDED SOURCES OF INFORMATION

Main:

1. Bashta O.V., Voloshchuk N.M., Vuyek A.O., Gentosh D.T., Pikovsky M.Y., Artemchuk I.P. Methodological recommendations for educational practice in phytopathology for applicants of the first (bachelor) level of higher education, specialty 202 Protection and quarantine of plants Kyiv: Editorial and publishing department of NUBiP of Ukraine. 2023. 78 pages.
2. Bashta O.V., Vuyek A.O. Workbook for performing laboratory work in General Phytopathology for students of the first (bachelor) level of higher education, specialty 202 Protection and quarantine of plants. Kyiv: Editorial and publishing department of NUBiP of Ukraine. 2023. 128 pages.
3. Bashta O.V., Voloshchuk N.M. Methodical guidelines for writing a coursework on general phytopathology for students of the BA "Bachelor" specialty 202 "Protection and Quarantine of Plants". Kyiv: Editorial and publishing department of NUBiP of Ukraine. 2022. 12 p.
4. Bashta O.V., Voloshchuk N.M., Vuyek A.O. Methodical instructions for laboratory work on general phytopathology for students of the BA "Bachelor" specialty 202 "Protection and Quarantine of Plants". Kyiv: Editorial and publishing department of NUBiP of Ukraine. 2022. 95 p.
5. Bhunjun C.S.; Phillips A.J.L.; Jayawardena R.S.; Promputtha I.; Hyde K.D. Importance of Molecular Data to Identify Fungal Plant Pathogens and Guidelines for Pathogenicity Testing Based on Koch's Postulates. *Pathogens* 2021. 10. 1096. <https://doi.org/10.3390/pathogens10091096>
6. Mapuranga J, Zhang N, Zhang L, Chang J, Yang W. Infection Strategies and Pathogenicity of Biotrophic Plant Fungal Pathogens. *Front Microbiol.* 2022 Jun 2;13:799396. doi: 10.3389/fmicb.2022.799396.
7. Modern Approaches in Plant Pathology. Elite Publishing House. 2023. 321 pp.

- Principles of Plant Pathology. Mishra R. C. & Singh R. (eds.). 2023. 19 pp.
<https://www.researchgate.net/publication/370025309>
8. Plant Pathology Concepts and Laboratory Exercises Third edition. – CRC Press. – 2016. – 598 p.
9. The Study of Plant Disease Epidemics. [Laurence V. Madden](#), [Gareth Hughes](#), and [Frank van den Bosch](#), 2017 <https://doi.org/10.1094/9780890545058>
10. Venbrux M, Crauwels S and Rediers H. Current and emerging trends in techniques for plant pathogen detection. *Front. Plant Sci.* 2023. 14:1120968. doi: 10.3389/fpls.2023.1120968
11. Phytopathology: Textbook [I.L. Markov, O.V. Bashta, D.T. Gentosh, V. A. Glymyazny, O.P. Dermenko, E. P. Chernenko]; under the editorship I.L. Markov. K., 2016. 548 p. 2.
12. General phytopathology: Education. manual / Under the editorship N.V. Pinchuk: -. Vinnytsia, 2018. – 272 p.

Internet resources:

1. European Journal of Plant Pathology <https://www.springer.com/journal/10658/>
2. Atlas of ornamental plant diseases. Access: <https://naurok.com.ua/atlas-hvorob-dekorativnih-roslin-320421.html>
3. Identifier of plant pests and diseases. KWS. Access: www.kws.com/ua/uk/agroservis/vyroshchuvannya-roslyn/zahyst-roslyn/vyznachnyk-shkidnykiv-ta-hvorob/
4. TOP-5 applications for diagnosing plant diseases. Access: <https://superagronom.com/news/5925-top-5-dodatki-dlya-diagnostiki-hvorob-roslin>
5. Diseases and pests of indoor plants. Access: <https://asterias.od.ua/860-khvorobi-ta-shkidniki-kimnatnikh-roslin-zakhist-i-likuvannya.html>