СИЛАБУС ДИСЦИПЛІНИ
"AGRICULTURAL PLANT PATHOLOGY"

Field of knowledge ***20 Agricultural sciences and food***
Educational degree ***First (undergraduate)***
Specialty ***202 Protection and quarantine of plants***
Educational program ***Plant protection and quarantine***
Year of training (course) - 4, Semester – 7,8
Full-time education

Number of ECTS credits– 4
The language of the course is English

Лектор курсу	**Voloshchuk N.M., associate professor, Dr. PhD**
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Сторінка курсу в eLearn	**https://elearn.nubip.edu.ua/user/view.php?id=9598&course=3049**

DESCRIPTION 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.

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.

COURSE STRUCTURE

Topic	hours (lectures/laboratory/independent)	Learning outcomes	Task	Assessment
Year of training (course) - 4, Semester – 7,8				
Content module 1. Diseases of grain and leguminous crops		**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	Preparation for lectures (preliminary familiarization with the presentation and full-text lecture and its appendices and cited sources of literature in eLearn).	
Topic 1. Wheat protection system against diseases.	2/3/1			2
Topic 2. Barley protection system against diseases.	2/2/1			2
Topic 3. Rye diseases and the system of measures for their control	-/1/3			1
Topic 4. Oat diseases and the system of measures to control them	-/1/3			1
Topic 5. Corn protection system against diseases.	2/2/1			2

Topic 6. Rice diseases and the system of their control measures	-/1/3	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	Completion and submission of laboratory work (in methodological recommendations - during the practical session and independently - in eLearn). Performing independent work (tasks in eLearn). Preparation and writing of the test (descriptive part in the form of a written/oral answer - in classroom classes and/or test - in eLearn	1 1 1 1 2 2 2 2 2 2 1 2 2 2 2
Topic 7. Millet diseases and the system of measures to control them	-/-/4			
Topic 8. Buckwheat diseases and the system of measures to control them	1/-/3			
Topic 9. Diseases of sorghum, sudanka and cereal grasses. System of their control measures.	1/-/3			
Topic 10. Pea diseases and the system of measures to control them	2/2/3			
Topic 11. Soybean diseases and the system of measures to control them	2/2/2			
Topic 12. Diseases of beans, fodder beans, lupine and vetch. System of their control measures	1/1/2			
Topic 13. Diseases of perennial legumes	2/-/3			
Content module II. Diseases of industrial crops				
Topic 1. Sunflower diseases and the system of measures to control their development.	3/3/4			
Topic 2. Hemp diseases and measures to limit their development	1/1/3			
Topic 3. Flax diseases and measures to limit their development	1/1/4			
Topic 4. Diseases of castor beans and measures to limit their development	1/-/3			
Topic 5. Rapeseed diseases and measures to limit their development	3/2/4			
Topic 6. Tobacco and shaggy diseases. A system of measures to limit their development	2/2/4			
Topic 7. Hop diseases and measures to limit their development	1/2/4			
Topic 8. Beet diseases and measures to limit their development	3/4/4			
Content module III. Diseases of potatoes and vegetable crops				

Topic 1. Potato diseases and the system of their control measures	3/4/6	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.		3
Topic 2. Diseases of tomatoes and the system of their control measures	2/2/4			3
Topic 3. Diseases of cabbage vegetable crops and the system of measures for their control	2/2/4			3
Topic 4. Onion and garlic diseases and the system of measures to control them	2/2/4			3
Topic 5. Carrot diseases and the system of their control measures	2/2/4			3
Topic 6. Diseases of pumpkin crops and the system of measures to control them	2/2/4			3
Topic 7. Diseases of greens and the system of measures to control them	2/1/4			2
Content module IV. Diseases of fruit and berry crops and grapes				
Topic 1. Diseases of seed fruit crops and the system of measures for their control	3/3/5			3
Topic 2. Diseases of stone fruit crops and the system of their control measures	2/3/5			2
Topic 3. Strawberry diseases and the system of measures to control them	2/2/4			2
Topic 4. Currant and Gooseberry diseases and the system of measures for their control	2/1/4			2
Topic 5. Raspberry and blueberry diseases and the system of their control measures	2/2/4			2
Topic 6. Diseases of grapes and the system of their control measures	2/3/4			2
Topic 7. Diseases of nuts and the system of their control measures	2/1/4			2
Додаткові бали можна отримати за підготовку доповіді та/або участь у конференції				до 10 балів
Всього за семестр Екзамен Всього разом				100*0,7 (максимум 70 балів) 30 балів 100 балів

ASSESSMENT POLICY

Deadlines and Rescheduling Policy:	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.
Academic Integrity Policy:	Writing, using mobile devices and additional literature during the relevant type of knowledge control and exam is strictly prohibited.
Attendance Policy:	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. Missed lectures are practiced by the student in the form of an interview with the teacher.

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 rating, points	The assessment is national for the assembly results	
	exams	credits
90-100	excellent	credited
74-89	good	
60-73	satisfactory	
0-59	unsatisfactory	not credited

To determine the student's (student's) rating for mastering the **R**dis discipline (up to 100 points), the obtained rating from the certification (up to 30 points) is added to the student's (student's) rating for the RPR educational work (up to 70 points):

$$\mathbf{R_{dis} = R_{EW} + R_{AT}}$$

Recommended Literature

Main:

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.

Addition:

1. Digital plant pathology: a foundation and guide to modern agriculture Kuska M.T.,· Heim R.H.J., Geedicke I., Gold K.M., Brugger A., Paulus S. // Journal of Plant Diseases and Protection (2022) 129:457–468 https://doi.org/10.1007/s41348-022-00600-z

2. He, D.-C.; He, M.-H.; Amalin, D.M.; Liu, W.; Alvindia, D.G.; Zhan, J. Biological Control of Plant Diseases: An Evolutionary and Eco-Economic Consideration. Pathogens 2021, 10, 1311. https:// doi.org/10.3390/pathogens10101311

3. Parthasarathy S., Lakshmidevi P., Chellappan G. Plant Pathology and Disease Management: Principles and Practices. Publisher: CRC Press, London, 2024. DOI: 10.1201/9781032711973

4. Scortichini, M. Sustainable Management of Diseases in Horticulture: Conventional and New Options. Horticulturae 2022, 8, 517. https://doi.org/10.3390/ horticulturae8060517

5. Trends in Plant Disease Assessment. Ed. Ul Haq I., Ijaz S.. Springer Nature Singapore Pte Ltd. 2022. – 279 pp. https://doi.org/10.1007/978-981-19-5896-0

6. Venbrux M, Crauwels S and Rediers H (2023) Current and emerging trends in techniques for plant pathogen detection. Front. Plant Sci. 14:1120968. doi: 10.3389/fpls.2023.1120968

7. Ayaz, M.; Li, C.-H.; Ali, Q.; Zhao, W.; Chi, Y.-K.; Shafiq, M.; Ali, F.; Yu, X.-Y.; Yu, Q.; Zhao, J.-T.; et al. Bacterial and Fungal Biocontrol Agents for Plant Disease Protection: Journey from Lab to Field, Current Status, Challenges, and Global Perspectives. Molecules 2023, 28, 6735.https://doi.org/10.3390/molecules28186735

8. North Dakota Field Crop Plant Disease Management Guide. Complied by Friskop A., Markell S.G., Khan M., 2021. – 152 pp.

9. Worrall, E.A.; Hamid, A.; Mody, K.T.; Mitter, N.; Pappu, H.R. Nanotechnology for Plant Disease Management. Agronomy 2018, 8, 285. https://doi.org/10.3390/agronomy8120285

10. Agroecological systems of integrated protection of fruit and berry crops from pests and diseases: recommendations. Kind. 2nd, add. and trans. / edited by I.V. Shevchuk. Kyiv: PP Sansparel, 2021. 188 p.

11. Protection of rice from pests, diseases and weeds: training. manual / Dudchenko V.V., Markovska O.E., Averchev O.V., Palamarchuk D.P., Makuha O.V. Kherson: OLDI-PLUS, 2021. 174 p.

12. Lavrenko S.O., Mrynskyi I.M. Pests and diseases of annual leguminous crops: study guide/edited by I.M. Mrynskyi. Kherson: OLDI-PLUS, 2020. 324 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.nbuv.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://dnsgb.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-shkidlivi-ta-potencijno-nebezpechni-xvorobi-funduka-ta-їx-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-agrohimikativ-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