Додаток 3
до наказу від 23.03.2023 р. № 244

SYLLABUS
«BIOLOGICAL CONTROL»

Educational level – Ferst (Bachelor)
Major 202 Plant Protection and Quarantine
Educational Program «Plant Protection and Quarantine»
Study year 4, semester 8
Form of study regular
Credits ESTS 7,0
Language of teaching English

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Сторінка курсу в eLearn	**https://elearn.nubip.edu.ua/course/view.php?id=3998**

COURCE DESCRIPTION

The overall course objective is to familiarize students with the principles and practices of using natural enemies and antagonists to manage the abundance of, and damage caused by, pests (invertebrates, plant pathogens, and weeds) in field crops, vegetable crops, fruit and berry plantations Primary focus will be placed on the biological control of pests of different plant systems . The discipline is aimed at familiarizing students with the basics of systematics, biology and ecology of the main groups of biological agents: entomophages, herbivores, pathogens and antagonists of the most important pests, weeds and pathogens of agricultural crops.

After course accomplishment students will be able to do:

- Describe some of the more typical natural enemies that can be used to control invertebrate pests, plant pathogens, and weeds, as well as the relative benefits and drawbacks of doing so.
- Describe how biological control is affected by ecological, physiological, and biochemical processes.
- Describe the many methods used to control pests via natural enemies and how each method fits into the integrated pest management framework.
- Describe the advantages and disadvantages of utilizing various biological control methods.
- List the monetary and legal elements that influence the creation and marketing of biological controls.
- Create a program outline for biological control for certain production systems.

COMPETENCIES OF THE EDUCATIONAL PROGRAM

Competence acquisition:

Integral competence. The ability to solve complex specialized tasks and practical problems of professional activity by plant protection and qurintine specialty and to apply theoretical knowledge and methods in production situations characterized by complexity and uncertainty of conditions.

of a bachelor in plant protection and quarantine - the ability to implement educational and social tasks:

General competencies of a bachelor's degree in plant protection and quarantine - the ability to implement educational and social tasks:

GC 3. Ability to communicate in a foreign language, ability to work in a foreign language environment.

GC 7. Ability to learn and master modern knowledge and search, process and analyze information from various sources

GC 9. Ability to make informed decisions.

Special (Professional) competencies of a bachelor's degree in plant protection and quarantine - the ability to perform professional duties by type of professional work:

SC 1. Ability to carry out phytosanitary diagnostics of plant diseases, insects, ticks, nematodes, rodents and weeds according to the latest principles and methods

SC 5. Ability to develop and apply plant protection technologies for agricultural and other purposes.

SC 8. Ability to comprehensively apply methods for long-term regulation, development and spread of pests to an economically insignificant level based on forecasts, economic thresholds of harmfulness, effectiveness of beneficial organisms, energy-saving and environmental technologies that provide reliable plant protection and environmental safety in accordance with the WTO SPS Agreement and the provisions of the European Union

Program learning outcomes:

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

PLO 7. Draw up technological maps for organizing plant protection measures

PLO 15. Realize the value of protecting the independence, territorial integrity and democratic system of Ukraine

COURCE STRUCTIRE

Topics	Overload	Results of study	Tasks	Assessment points
Module 1				
Topic 1 State of the art on cur biocontrol use and perspectives in Ukrain	2/6	To know and understand the history of development and basic concepts of biological protection of plants. Study of theoretical material based on lecture notes and literary sources.	To learn theoretical material using lecture notes and references. Submission of laboratory work assignment.	**10**
Topic 2. Type of of relations between organisms In biocenoses, which are most important for biological control	2/6	To gain knowalage and understand the main types of relationships between organisms that are the basis of biological protection of plants: parasitism, predation. Types of parasitism	To learn theoretical material using lecture notes and references. Submission of laboratory work assignment.	**10**
		Модуль 2		
Topic 3. Principal strategies in biological control	2/5	To know and be able to apply in practice ways of activation of natural biological agents based on REE calculations.	To learn theoretical material using lecture notes and references. Submission of laboratory work assignment.	**5**
Topic 4. Review of the main entomophages and	2/6	To get kbowlage and understand the morphology , biology	To learn theoretical material using lecture notes and references.	**5**

acariphages of pests in open and closed soil		ane ecology of natural enemies of polyphagous pests, pest of cereals, legumes, vegetable, ornamental crops and orchards and berries and pests of green houses	Submission of laboratory work assignment. To write intermediate test to access obtained knowledge in module	
Module 2				
Topic 5. General information about insect diseases	3/9,5	To know and understand the theory and to be able to apply in practice seasonal release and augnebtation of beneficial insect, mites and nematodes	To learn theoretical material using lecture notes and references. Submission of laboratory work assignment.	**20**
Topic 6. Characterisitc of fungal and viral deseases of insects. Review of biopesticides produced based on entomopathigenic	2/6	Understand the basis of insect pathology Ti be able to determine key insect deseases	View educational films. Study of theoretical material based on lecture notes and literary sources. Submission of practical works	**10**
Topic 7. Use of bacteries and entomopathogenic nematodes for biocontrol	2/5,5	To know the characteristics, mechanism of action and regulations for the use of microbiological preparations against	To watch educational videos Study of theoretical material based on lecture notes and literary sources. Submission of practical works	**10**

		pests, mites and rodents.		
Total for the course	**60**			**70**
Final test (exam)				**30**
				100

ASSESSMENT POLICY

Deadlines and Rescheduling Policy:	Laboratory works that are submitted late without good reason will be assigned a lower grade. Modules can be rearranged with the permission of the lecturer if there are good reasons (for example, sick leave).
Academic Integrity Policy:	Cheating during tests and exams is prohibited (including using mobile devices). Independent works, essays must have correct text references to the used literature.
Attendance Policy:	Attending classes is mandatory. For objective reasons (for example, illness, international internship), training can take place individually (in online form with the agreement of the dean of the faculty)

SCALE OF ASSESSMENT OF STUDENT KNOWLEDGE

Student Score	**National score base on pre-final and final tests**	
	Final tests	**Pre-final tests**
90-100	Excellent	Passes
74-89	Good	
60-73	Fair	
0-59	Failed	Not passed

STUDY SOURCES

- Bellows TS Fisher TW (eds).1999. Handbool of Biological Control. Academic Press, 1046 p.
- Opender Koul, G S Dhaliwal, G W Cuperus. Integrated Pest Management: Potential, Constraints and Challenges CABI Publishing,2004, 329 pp.
- Gimme H Walter (eds), Insect Pest Management and Ecological Research
- Cambridge University Press.2023, 300p.
- L. G. Copping (eds) The Manual of Biocontrol Agents: A World Compendium 4th Edition CABI,2011, 896 p
- Heimpel, G. E., & Mills, N. J. (2017). *Biological control*. Cambridge University Press. Publisher:Cambridge University Press Online ISBN:9781139029117 DOI:https://doi.org/10.1017/9781139029117
- Білик М.О. Біологічний захист рослин від шкідливих організмів: підручник; Харків: Майдан, 2022. 356