


**NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF
UKRAINE**

Department Entomology, integrated protection and quarantine of plants

"APPROVED"
Dean of the Faculty
Plant protection, Biotechnology and Ecology
(Yulia KOLOMIYETC)
Protocol № 9 dated "23" 05 2024.



"APPROVED"
at the meeting of the department Entomology,
integrated protection and quarantine of plants
Protocol №12_ dated "22" 05 2024.


Head of Department
(Mykola DOLYA)

"REVIEWED "
Guarantor of the AP
Plant protection and quarantine
(Myroslav PIKOVSKYI)

PROGRAM OF THE COURSE

GENERAL ENTOMOLOGY

Field of knowledge 20 Agricultural sciences and food
Specialty 202 "Plant protection and Quarantine
Academic programme "Plant protection and Quarantine"
Faculty Plant protection, Biotechnology and Ecology
Author: PhD, Associated Professor Liudmyla Kava

Kyiv – 2024 y.

Description of the discipline General entomology _____

(title)

Field of knowledge, specialization, educational program, educational degree		
Academic degree	<i>Bachelor's</i>	
Specialty	<i>202 Plant protection and Quarantine</i>	
Academic programme	<i>Plant protection and Quarantine</i>	
Characteristics of the discipline		
Type	Compulsory	
Total number of hours	240	
Number of ECTS credits	8	
Number of content modules	4	
Course project (work) (if applicable)	30	
Form of assessment	<i>Exam</i>	
Indicators of the course for full-time and part-time forms of study		
	Full-time form of study	Part-time form of study
Course (year of study)	3	3
Semester	5,6	6
Lecture classes	60	8
Practical, seminar classes		
Laboratory classes	90	12
Self-study	90	94
Individual assignments		
Number of weekly classroom hours for the full-time form of study	4	

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

Aim:

- Explain the importance of insects as members of ecosystems.
- Describe the basic anatomy, morphology, taxonomy, development, life histories and key characteristics of different insect groups.
- Identify common orders and families of insects.
- Demonstrate the ability to properly collect and curate insects

Objectives: It is expected that at the end of this course, you should be able to:

- Explain which order an insect belongs to
- Describe something about an insect's structure and function
- Increase your insect appreciation and decrease your entomophobia (ento - insect, phobia - fear)
- Explain the importance of insects
- Describe basic insect structure and function
- Describe the basic classification of economically important insects
- Explain how insects affect humans
- Discuss and explain major events in arthropod and insect evolution and unique aspects of their biology that have contributed to their diversity.
- Classify and characterize insects with particular reference to vector diseases
- Describe insect ecology
 - o Insect anatomy
 - o Insect physiology
 - o Insect environment and entomology
- Understand the classes of insecticides, their formulation and application
- Compare and contrast human and insect respiratory, endocrine, digestive, circulatory, and reproductive systems.

Acquisition of competencies:

Integrated competency (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 competencies (GC):

GC2 Ability to apply knowledge in practical situations.

GC3. Knowledge and understanding of the subject area and understanding professional activity

GC8 Ability to generate new ideas (creativity).

GC11. Ability to work in an international context considering international and regional standards on phytosanitary measures, international and regional organizations of plant protection and quarantine.

Professional (special) competencies (PC)

SC1 Ability to do phytosanitary diagnosis of plant diseases, insects, mites, nematodes, rodents and weeds according to modern principles and methods.

SC3 The ability to forecast of processes of development and spread of harmful organisms.

Expected Learning Outcomes (ELO):.

ELO 8 Be able to coordinate, integrate and improve organization of production processes during protection measures plants;

ELO 9 Effectively plan time to receive forecasts results of plant protection and quarantine activities

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

2. Programme and structure of the discipline for:

- complete full-time (part-time) form of study;
- shortened full-time (part-time) form of study.

2	Number of hours													
	Full-time form							Part-time form						
	we eks	tot al	including					total	including					
			l	p	lab	in d	sel f		l	p	lab	in d	sel f	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Module 1. Formation of entomology as a science. External anatomy														
Topic 1. Introduction. Subject main objectives of the subject "General entomology"	1		2		2									2
Topic 2. Importance of Insects. Evolution and Diversity	2		2		2		2							2
Topic 3. External anatomy (exoskeleton). The Integument and Cuticular Structures	3		2		2		2		0,5		0,5			2
Topic 4. The Head. Antennae.	4		2		2		2		0,5		0,5			2
Topic 5. Mouthpart and modification.	5		2		2		2		0,5		0,5			2
Topic 6. Torax (legs, wings and locomotion)	6		2		4		2		0,5		0,5			4
Topic 7. Abdomen	7		2		4		2				0,5			4
Topic 8. Egg Structure The types of insect's eggs	8		2		4		2				0,5			4
Topic 9. The types of insect's larva	9		2		4		2							4
Topic 10. The types of insect's pupa	10		2		4		2							4
Total for content module 1	70		20		30		20		2		3			30
Module 2. Internal Anatomy and Physiology														
Topic 1 Respiratory System	11		2		2		2		0,5		0,5			2
Topic 2.. Circulatory System	12		2		2		2		0,5		0,5			2
Topic 3. <u>Digestive & Excretory Systems</u>	13		2		2		2		0,5		0,5			2
Topic 4. <u>Reproductive System</u>	14		2		2		2		0,5		0,5			2
Topic 5. Nervous System	15		2		4		2				0,5			4

Topic 6. Endocrine System and hormone	16		2		2		2			0,5		4
Topic 7. Muscular system of insects and locomotion	17		2		2		2					4
Total for content module 2		44	14		16		14		2	3		20
Module 3. Growth and Development and Behavior. Insects ecology												
Topic 1. Embryogenesis	18		2		2		2		0,5	0,5		2
Topic 2. Morphogenesis	19		2		2		2		0,5	0,5		2
Topic 3. Survival Strategies	20		2		4		2		0,5	0,5		4
Topic 4. Insect Defenses	21		2		4		2		0,5	0,5		4
Topic 5. Population Dynamics	22		2		4		2			1		4
Total for content module 3		36	10		16		10		2	3		16
Module 4. Systematics and Taxonomy												
Topic 1. Introduction to Systematics The Arthropods and Hexapods	23		2		4		2			0,5		4
Topic 2. Entognatha	24		2		6		2		0,5	0,5		6
Topic 3. Apterygota	25 26		4		6		4		0,5	0,5		6
Topic 4. Pterygota. Hemimetabola	27 28		4		6		4		0,5	0,5		6
Topic 5. Pterygota. Holometabola	29 30		4		6		4		0,5	1		6
Total for content module 4		60	16		28		16		2	3		28
Total hours												
Course project (work) on <hr style="width: 20%; margin-left: 0;"/> (if included in the curriculum)	30		-		-		-		-	-		-
Total hours												
	240		60		90		60		8	12		94

3. Topics of laboratory (practical, seminar) classes

No	Theme	Amount of hours
1	Introduction. Subject main objectives of the subject "General entomology"	5
2	Importance of Insects	5
3	Evolution and Diversity	5
4	External anatomy (exoskeleton)	5
5	External anatomy. Head. Antennae. Mouthpart and modification.	5

6	Torax (legs, wings and locomotion) and Abdomen	15
7	Digestive & Excretory Systems	5
8	Circulatory System and Respiratory System	5
9	Reproductive System	5
10	Egg Structure	5
11	Embryogenesis	5
12	Morphogenesis	5
13	Introduction to Systematics. The Arthropods and Hexapods	6
14	Apterygota and Pterygota	8
15	Hemipteroids and Holometabola	6
16	Survival Strategies	5
17	Insect Defenses	5
18	Population Dynamics	5
	Total amount	90

4. Topics for self-study

No	Topic title	Number of hours
1	Insect Societies: Termites	6
2	Insect Societies: Ants	6
3	Insect Societies: Bees	6
4	Insect Predation	6
5	Insect Parasitism	6
6	Medical Entomology	6
7	Ground-Dwelling Insects	6
8	Aquatic Insects	6
9	Pollination, Co-evolution, Mutualism	6
10	Defense and Mimicry	6
	Total hours	60

5. . Tools for assessing expected learning outcomes:

- exam;
- credit;
- module tests;
- abstracts;
- graphic design works;
- presentation of laboratory and practical works;

6. Teaching methods:

- verbal method (lecture, discussion, interview, etc.);
- 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;

7. Assessment methods:

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

8. Distribution of points received by students

The assessment of students' knowledge and skills is conducted by means of a 100-point scale and is converted into national grades according to Table 1 of the current Exam and Credit Regulations at NULES of Ukraine

Student rating, points	National grade based on exam results	
	Exams	Credits
90-100	excellent	passed
74-89	good	
60-73	satisfactory	
0-59	unsatisfactory	fail

To determine a student's rating in the discipline R_{DIS} (up to 100 points), the received assessment rating R_A (up to 30 points) is added to the academic performance rating R_{AP} (up to 70 points): $R_{DIS} = R_{AP} + R_A$.

9. Teaching and learning aids

- e-learning course of the discipline (<https://elearn.nubip.edu.ua/course/view.php?id=512>);
- 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. Recommended sources of information

1. T.R. Stefanovska, S.V. Kucherovska., V.V. Kava. 2016, Agricultural Entomology, Komprint Press, Kiev, 375 p.
2. Guidelines for Insecticide Use. Lexington: University of Kentucky, Department of Entomology, 1989.
3. Guidelines for the Control of Insect and Mite Pests of Foods, Fibers, Feeds, Ornamentals, Livestock, and Households. Washington, DC: United States Department of Agriculture, U.S. Government Printing Office, 1982.
4. Entomology (student reference) university of Missouri-Columbia Instruction materials laboratory, 1991 Insect Control Recommendations. Columbia: University of Missouri Extension, 1990