

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

Department Entomology, integrated protection and quarantine of plants

APPROVED

Faculty Plant protection,
Biotechnology and Ecology

Protocol № 9 dated “21” 05 2026

PROGRAM OF THE COURSE

GENERAL ENTOMOLOGY

Field of knowledge H "Agriculture, forestry, fisheries and veterinary medicine"

Specialty _ H1 "Agronomy"

Academic programme Plant protection and Quarantine"

Faculty Plant protection, Biotechnology and Ecology

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Description of the discipline General entomology

The course is designed to teach students to identify insect, study of insects, their external and internal building. After this course student will be able to explain the importance of insects and to use standart keys to idetifying insects to family and subfamily. Basic concepts of entomology such as morphology, taxonomy and systematics, developmental biology, and ecology provide important background information for Agricultural Entomology

Field of knowledge, specialization, educational program, educational degree		
Academic degree	<i>Bachelor's</i>	
Specialty	<i>H1 "Agronomy"</i>	
Academic programme	<i>Plant protection and Guarantine</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, 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

Acquisition of competencies:

Integrated competency (IC): The ability to solve complex specialized tasks and practical problems of professional activity in plant protection and quarantine or in the learning process, characterized by complexity and uncertainty of conditions, using theories and methods of biology and agricultural sciences.

General competencies (GC):

GC 1 The ability to think abstractly, analyze, and synthesize.

GC 2 Ability to apply knowledge in practical situations.

GC 8 Ability to generate new ideas (creativity).

GC 11. 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)

SC 1 Ability to do phytosanitary diagnosis of plant diseases, insects, mites, nematodes, rodents and weeds according to modern principles and methods.

SC 4 Ability to communicate in the state language both orally and in writing.

SC 5 Ability to communicate in a foreign language, ability to work in a foreign language environment.

SC 7 Ability to learn and master modern knowledge and research

SC 8 The ability to generate new ideas (creativity).

SC 9 Ability to make informed decisions.

SC 11 Ability to work in an international context, taking into account international and regional standards on phytosanitary measures, international and regional plant protection and quarantine organizations

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:

2	Number of hours													
	Full-time form							Part-time form						
	we eks	tot al	including					total	including					
1			p	lab	in d	sel f	1		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. Population Dynamics	21		2		4		2		0,5		0,5		4
Topic 5. Application of digital databases and mobile applications in the study of insect fauna	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 <small>(if included in the curriculum)</small>	30		-		-		-		-		-		-
Total hours													
	240		60		90		60		8		12		94

3. Topics of lectures

№	Theme	hours
1	Introduction. Subject main objectives of the subject "General entomology"	2
2	Importance of Insects. Evolution and Diversity	2
3	External anatomy (exoskeleton). The Integument and Cuticular Structures	2
4	The Head. Antennae.	2
5	Mouthpart and modification.	2
6	Torax (legs, wings and locomotion)	2

7	Abdomen	2
8	Egg Structure The types of insect's eggs	2
9	The types of insect's larva	2
10	The types of insect's pupa	2
11	Respiratory System	2
12	Circulatory System	2
13	Digestive & Excretory Systems	2
14	Reproductive System	2
15	Nervous System	2
16	Endocrine System and hormone	2
17	Muscular system of insects and locomotion	2
18	Embryogenesis	2
19	Morphogenesis	2
20	Survival Strategies	2
21	Insect Defenses	2
22	Population Dynamics	3
23	Topic 1.Introduction to Systematics	3
24	The Arthropods and Hexapods	3
25	Entognatha	3
26	Apterygota	3
27	Pterygota. Hemimetabola	3
	Total amount	60

4. Topics of laboratory (practical, seminar) classes

№	Theme	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

5. Topics for self-study

№	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

6. Methods of assessing expected learning outcomes:

- oral or written survey;
- interview;
- test;
- defending laboratory/practical, design/graphical works, projects;
- peer-to-peer assessment, self-assessment.

7. Tools for assessing expected learning outcomes:

- problem-based method;
- practice oriented studying method;
- case method;
- project education method;
- flipped classroom, mixed education method;
- research based method;
- learning discussions and debates method;
- team work, brainstorm method

8. Teaching methods:

The student's knowledge is assessed by means of a 100-point scale converted into the national grades according to the "Exam and Credit Regulations at NULES of Ukraine" in force

8.1. Distribution of points by types of educational activities

Educational activity	Results	Assessment
Module 1. Formation of entomology as a science. External anatomy		
Laboratory work 1.	To know and understand the task and history of Entomology, To know external anatomy of insects, types of mouthparts, of which parts of them are composed as well types of staging heads, wing types and limbs, features anatomical structure. Be able to: determine mouthparts, types of the insect's wings and legs ability to cause damage, their features fertility	6
Laboratory work 2.		6
Laboratory work 3		6
Laboratory work 4		6
Laboratory work 5		6
Laboratory work 6		6
Laboratory work 7		6
Laboratory work 8		6
Laboratory work 9		6
Laboratory work 10		6
Self-study	Distinguish: main morphological and anatomical components insect structures	10
Module control work 1.		30
Total for module 1		100
Module 2. Internal Anatomy and Physiology		
Laboratory work 11	To know and understand the task and history of Entomology, To know external anatomy of insects, types of mouthparts, of which parts of them are composed as well types of staging heads, wing types and limbs, features anatomical structure.	6
Laboratory work 12		6
Laboratory work 13		6
Laboratory work 14		6
Laboratory work 15		6
Laboratory work 16		6
Laboratory work 17		6
Laboratory work 18		6
Laboratory work 19		6
Laboratory work 20		6
Self-study		10
Module control work 2.		30
Total for module 2		100
Module 3. Growth and Development and Behavior. Insects ecology		
Laboratory work 21	To know the embryonic development of insects biological role metamorphosis structure eggs and types oviposition, meaning each stage development in life insects.. behind the larva stage Reasons diapause and her importance in life cycles Be able: identify of family belonging to insects by types of eggs and oviposition, identify species affiliation	6
Laboratory work 22		6
Laboratory work 23		6
Laboratory work 24		6
Laboratory work 25		6
Laboratory work 26		6
Laboratory work 27		6
Laboratory work 28		6
Laboratory work 29		6
Laboratory work 30		6
Self-study		10

Module control work 3.		30
Total for module 3		100
Module 4. Systematics and Taxonomy		
Laboratory work 11		6
Laboratory work 12		6
Laboratory work 13		6
Laboratory work 14		6
Laboratory work 15		6
Laboratory work 16		6
Laboratory work 17		6
Laboratory work 18		6
Laboratory work 19		6
Laboratory work 20		6
Self-study		10
Module control work 4.		30
Total for module 4		100
Class work	$(M1 + M2+M3+M4)/2*0,7 \leq 70$	
Exam/credit	30	
Total for year	$(\text{Class work} + \text{exam}) \leq 100$	
Course project/work (if any)		100

8.1. Scale for assessing student's knowledge

Student's rating, points	National grading (exam/credits)
90-100	excellent
74-89	good
60-73	satisfactory
0-59	unsatisfactory

8.2. Assessment policy

<i>Deadlines and exam retaking rules</i>	<i>EXAMPLE:</i> works that are submitted late without valid reasons will be assessed with a lower grade. Module tests may be retaken with the permission of the lecturer if there are valid reasons (e.g. a sick leave).
<i>Academic integrity rules</i>	<i>EXAMPLE:</i> cheating during tests and exams is prohibited (including using mobile devices). Term papers and essays must have correct references to the literature used
<i>Attendance rules</i>	<i>EXAMPLE:</i> Attendance is compulsory. For good reasons (e.g. illness, international internship), training can take place individually (online by the faculty dean's consent)

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. ISBN 978-966-929-352-7.
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