**Додаток 3**

до наказу від 23.03.2023 р. № 244

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|  | **COURSE SYLLABUS**  **«GENERAL ENTOMOLOGY»** |
| **Degree of higher education - Bachelor** |
| **Specialization** 202\_"Plant protection and Guarantine"\_\_\_ |
| **Educational programme «**Plant protection and Guarantine **»** |
| **Academic year** 3**\_, semester** 5,6**\_\_\_\_\_\_\_\_\_**  **Form of study \_** full-time **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| **Number of ECTS credits\_8\_\_\_\_\_\_\_** |
| **Language of instruction** English \_\_\_\_\_\_\_\_\_\_\_\_ |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
| **Lecturer of the course** | **PhD in Agricultural Science. Associate Professor Liudmyla Kava**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| **Contact information of the lecturer (e-mail)** | **044-527-85-14\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **kavalyuda@ukr.net \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| **Course page on eLearn** | **https://elearn.nubip.edu.ua/course/view.php?id=512** |

**COURSE DESCRIPTION**

*(up to 1000 printed characters)*

The cource is desighned to teach students to identify insect, study of insects, their external and internal biulding. 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

*Course task:*

The protection of plants to reduce or prevent the loss of crop crops from harmful insects in the vegetation period and during storage. The nature of damages and the quantity of ungraded harvest are related not only to pest behavior, but also with the appropriate reaction of the plant to damage caused by its varietal characteristics, economic conditions, etc.

The cource “General Entomology” contributes (according to the educational program of this major ) to the forming of teorhetical and applied professional skills and achevements of study perfirmence according to which student have:

*To know* :

1. Species composition of pests spread in Ukraine;

2**.** How to identify insects based on their morphological features, biological characteristics, damages, their phenology and ecology;

*To be able:*

1. Explain the importance of insects as members of ecosystems. 2. Gain an appreciation of insect biology, diversity and ecology.

3. Describe the basic anatomy, morphology, taxonomy, development, life histories and key characteristics of different insect groups.

4. Identify common orders and families of insects.

5. Demonstrate the ability to properly collect and curate insects.

**Competencies of the educational programme:**

*Integrative competency (IC):\_* The ability to solve complex specialized tasks and practical problems of professional activity by specialty and to apply theoretical knowledge and methods in production situations characterized by complexity and uncertainty of conditions. *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*General competencies (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 8. Ability to generate new ideas (creativity).

GC 11. Ability to make informed decisions.

GC 14. The ability to preserve and multiply moral, cultural, scientific values ​​and achievements of society on based on the understanding of history and patterns of development subject area, its place in the general system of knowledge about nature and society and in the development of society, techniques and technologies, use different types and forms of motor activity for active recreation and leading a healthy lifestyle.

**Program learning outcomes (PLO) of the educational programme:**

PLO 12. To comply with the requirements of legislation in the field of protection and quarantine of plants and promptly respond to changes in legislation.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PLO 13. Comply with labor protection requirements.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**COURSE STRUCTURE**

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| --- | --- | --- | --- | --- |
| **Topic** | **Hours**  (lectures/ laboratory, practical sections) | **Learning outcomes** | **Tasks** | **Assessment** |
| **5 semester** | | | | |
| **Module 1.** MORPHOLOGY OF INSECTS, ANATOMY AND PHYSIOLOGY  INSECTS | | | | |
| **Topic 1.** Introduction  to “General  Entomology”  Arthropod Evolution and Arthropod Systematics  Insect Evolution and Systematics I: Origins, Processes | 2/2,5 | 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, typesf the insect's wings and lags  ability to cause damage, their features fertility  Distinguish: main morphological and anatomical components insect structures | Study theoretical lecture part using text book and lectures notes  Laboratory session  “Arthropod Systematics Availability performed practical works in working  Notebooks and sending them electronic file via Elearn system | 5 |
| **Topic 2.**  External Anatomy | 2/3 | 5 |
| **Topic 3.** The Exoskeleton | 2/2 | 5 |
| **Topic 4.** The Head. The Antenae and types of Antennae | 2/4 | 5 |
| **Topic 5**. The mouthparts | 2/4,5 | 4 |
| **Topic 6.** The Thorax and Modification | 2/2 | 4 |
| **Topic 7.** Abdomen and Modifications | 2/4 | 4 |
| **Topic 8.** Digestion and Excretion | 2/2 | 4 |
| **Topic 9. Circulatory system** | 2/2 | 4 |
| **Topic 10**. The respiratory system. [Respiration in Aquatic Insects](https://projects.ncsu.edu/cals/course/ent425/library/tutorials/internal_anatomy/aquatic_insects.html) | 2/3 | 2 |
| **Topic 11.** [Reproductive System](https://projects.ncsu.edu/cals/course/ent425/library/tutorials/internal_anatomy/reproductive.html) | 2/2 | 2 |
| **Total for the module 1 22|33** | | | | **44** |
| **Module 2** GROWTH, DEVELOPMENT AND BEHAVIOR OF INSECTS | | | | |
| **Topic 12.** [Egg Structure](https://projects.ncsu.edu/cals/course/ent425/library/tutorials/growth_development/egg_structure.html) | 2/2 | To know the embryonic development of insects biological role metamorphosis structure eggs and types oviposition, meaning each stage development in life insects. 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 behind the larva stage | Study theoretical lecture part using text book and lectures notes  Laboratory | 5 |
| **Topic 13**Embryogenesis | 2/2 | 4 |
| **Topic 14.** Morphogenesi**s** Insect Development and Life Histories | 2/2 | 4 |
| **Topic 15.** [Insect Senses](https://projects.ncsu.edu/cals/course/ent425/library/tutorials/behavior/senses.html) | 2/2 | 4 |
| **Topic 16.** [Elements of Behavior](https://projects.ncsu.edu/cals/course/ent425/library/tutorials/behavior/elements_of_behavior.html) | 2/2 | 5 |
| **Topic 17.** [Periodic Behavior](https://projects.ncsu.edu/cals/course/ent425/library/tutorials/behavior/periodic_behavior.html) | 2/2 | 4 |
| **Topic 18.** Insect Communication ([Tactile Communication](https://projects.ncsu.edu/cals/course/ent425/library/tutorials/behavior/tactile.html), [Acoustic Communication](https://projects.ncsu.edu/cals/course/ent425/library/tutorials/behavior/acoustic-chemical/acoustic.html), [Chemical Communication](https://projects.ncsu.edu/cals/course/ent425/library/tutorials/behavior/acoustic-chemical/chemical.html), [Visual Communication](https://projects.ncsu.edu/cals/course/ent425/library/tutorials/behavior/visual.html)) | 2/2 | 10 |
|  | | | |  |
| **Total for the modul 2** 14/14 | | | | **26** |
| **Total for the 5,6 semester** 26/51 | | | | **70** |
| **Exam** | | | | **30** |
| **Total for course** | | | | **100** |

**ASSESSMENT POLICY**

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| ***Policy regarding deadlines and resits:*** | Assignments submitted after the deadline without valid reasons will be graded lower. Resitting of modules will be allowed with the permission from the lecturer and in the presence of valid reasons (e.g. medical reasons). |
| ***Academic honesty policy:*** | Cheating during tests and exams is strictly prohibited (including the use of mobile devices). Coursework and research papers must contain correct citations for all sources used. |
| ***Attendance policy:*** | Class attendance is mandatory. In case of objective reasons (such as illness or international internships), individual learning may be allowed (in online format by the approval of the dean of the faculty). |

**SCALE OF ASSESSMENT OF STUDENT KNOWLEDGE**

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| --- | --- | --- |
| **Student rating, points** | **National grade based on exam results** | |
| **exams** | **credits** |
| 90-100 | excellent | passed |
| 74-89 | good |
| 60-73 | satisfactory |
| 0-59 | unsatisfactory | not passed |

**RECOMMENDED SOURCES OF INFORMATION**

1. Stefanovska T.R.,. Kucherovska S.V., Kava L. P., Agricultural Entomology. Kiev: Komprint Press. 2016. 375 p.
2. Guidelines for Insecticide Use. Lexington: University of Kentucky, Department of Entomology, 1999.
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-Colombia Instruction materials laboratory, 1991
5. Insect Control Recommendations. Columbia: University of Missouri Extension, 1990