SZKOŁA GŁÓWNA GOSPODARSTWA WIEJSKIEGO

Herbivorous invertebrates and their enemies

Educational subject description sheet

Basic information

Field of study Biotechnology	**Didactic cycle** 2024/25
Speciality -	**Subject code** BBTBTjS_D.310.01617.24
Organizational unit Faculty of Biology and Biotechnology	**Lecture languages** english
Study level first cycle (engineering degree)	**Mandatory** Elective subjects
Study form full-time studies	**Block** Major subjects
Education profile General academic	**Disciplines** Biological sciences

Coordinator	Małgorzata Kiełkiewicz-Szaniawska
Teacher	Małgorzata Kiełkiewicz-Szaniawska

Period Semester 5	**Examination** Pass with grade **Activities and hours** Lecture: 15 Laboratory exercises: 15	**Number of ECTS points** 2

Goals

Code	Goal
C1	Teaching the biology of herbivorous pests and their natural enemies; Teaching the ability to recognize pests and their enemies (insects and mites) and nematodes, as well as the damages inflicted by these pests; Presenting the principles of non-chemical and chemical methods in integrated pest management, and indicating their advantages to humans and the environment; Developing the ability to choose methods of limiting pest population density based on the knowledge of the pest’s biology, its developmental stages and the plant injury rate.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – Student knows and understands:			
W1	the principles of integration of non-chemical methods in Integrated plant protection (IPM)	BTj_K3_W10	Written credit, Test (written or computer based)
W2	the key principles allowing for the identification of the most economically important pests	BTj_K3_W09	Written credit, Test (written or computer based)
Skills – Student can:			
U1	analyze and explain tri-trophic interactions (plant – pest – enemies) and identify the advantages for humans and the environment resulting from the application of the chosen non-chemical methods decreasing pest population density	BTj_K3_U14_inz	Written credit, Test (written or computer based)
U2	procure information from various sources, analyze it, report (in form of essays, reports and/or laboratory reports) and draw conclusions, both individually and in a team	BTj_K3_U20, BTj_K3_U21, BTj_K3_U22	Written credit, Test (written or computer based)
Social competences – Student is ready to:			
K1	update and broaden their knowledge and skills	BTj_K3_K01	Test (written or computer based)
K2	develop and implement non-chemical methods before the application of synthetic pesticides becomes necessary	BTj_K3_K02	Test (written or computer based)

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Presenting the key aspects of sustainable plant protection against herbivorous invertebrates (e.g. pests) as a part of sustainable agriculture – basic ideas and principles. Explaining mass pests appearances on crops. Explaining the Economic Injury Level (EIL) Concept. Presenting modern pest monitoring, signaling and forecasting methods. Discussing pest prevention methods (quarantine, agro-technical treatments, mixed crops, resistant crops) and interventional methods (mechanical, physical, biological, chemical) to decrease pest population density. Presenting integrated pest management (IPM) methods based on case studies.	W1, W2	Lecture

No.	Course content	Subject's learning outcomes	Activities
2.	Discussing the most important pests anatomy and development; Learning about the biology and harmfulness of chosen mite- and insect-pest species with various mouthpieces (piercing-sucking, biting-chewing) infesting above-grown plant organs, as well as insect-pests and plant nematodes infesting below-grown plant organs; Recognizing pests' most important natural enemies (predators, parasites, pathogens, parasitoids) and learning about the practical methods of their commercial use.	U1, U2, K1, K2	Laboratory exercises

Course advanced

Activities	Methods of conducting classes
Lecture	Lecture
Laboratory exercises	Teamwork, Individual work, Laboratory (experiment), learning by experiment, Observation

Activities	Examination method	Percentage
Lecture	Written credit	60%
Laboratory exercises	Test (written or computer based)	40%

Activities	Credit conditions
Lecture	In order to pass the course it is necessary to obtain 51%
Laboratory exercises	In order to pass the course it is necessary to obtain 51%

Literature

Obligatory

1. Pechenik Jan Biology Of The Invertebrates, McGraw-Hill Education (Asia), 2014; ISBN: 9789814738613
2. Wheater C Philip Studying invertebrates, Pelagic Publishing Ltd, 2016

Optional

1. Review articles
2. Original research articles

Calculation of ECTS points

Activity form	Activity hours*
Lecture	15
Laboratory exercises	15
Preparation for the exam	10

Preparation for the test	10
Student workload	**Hours** 50
Number of ECTS points	**ECTS** 2

* hour means 45 minutes

Effects

Code	Content
BTj_K3_K01	The graduate is ready to proper storage of data, updating and extending knowledge on topics related to biotechnology and the related sciences;
BTj_K3_K02	The graduate is ready to development and application of one’s skills in practice (including communication, teamwork), which enable effective lifelong learning with respect to biological sciences;
BTj_K3_U14_inz	The graduate can translate the results of experiments into practical solutions;
BTj_K3_U20	The graduate can plan and organise work, both individual and in a team
BTj_K3_U21	The graduate can coping with understanding, planning and analysing; being able to interpret and report biological data acquired while working individually and in a group;
BTj_K3_U22	The graduate can find and assess information from various sources, including from original research, and present in a well organised manner (e.g. essays, reports and laboratory reports);
BTj_K3_W09	The graduate knows and understands living organisms and their place in the natural environment, and how they can be used for the good of humanity;
BTj_K3_W10	The graduate knows and understands terms, principles and theories related to processes and mechanisms which have shaped the world of nature, knowing how they can be used efficiently;