

Nazwa zajęć/ <i>Course title:</i>	Roślinożerne bezkręgowce i ich wrogowie	ECTS	2
Nazwa zajęć w j. angielskim/ <i>Course title in English:</i>	Herbivorous invertebrates and their enemies		
Zajęcia dla kierunku studiów/ <i>Degree program name:</i>	Biotechnology		

Język kursu/ <i>Course language:</i> English		Poziom studiów/ <i>Study level:</i>	
Typ studiów/ <i>Form of studies:</i> <input checked="" type="checkbox"/> intramural <input type="checkbox"/> extramural	Status zajęć/ <i>Course status</i> <input type="checkbox"/> podstawowe/ <i>basic</i> <input checked="" type="checkbox"/> kierunkowe/ <i>major</i> <input type="checkbox"/> obowiązkowe/ <i>mandatory</i> <input checked="" type="checkbox"/> do wyboru/ <i>elective</i>	Semestr/ <i>Semester:</i> 5	<input checked="" type="checkbox"/> semestr zimowy/ <i>winter semester</i> <input type="checkbox"/> semestr letni/ <i>summer semester</i>
Rok akademicki/ <i>Academic year:</i>		2022/2023	Numer katalogowy/ <i>Catalogue number:</i> BBT_BTa-1S-5Z-42_8

Koordynator zajęć/ <i>Course coordinator:</i>	Prof. dr hab. Małgorzata Kielkiewicz-Szaniawska		
Prowadzący zajęcia/ <i>Teachers responsible for the course:</i>	Prof. dr hab. Małgorzata Kielkiewicz-Szaniawska And employees of the Department of Plant Protection, Institute of Horticultural Sciences, WULS-SGGW		
Założenia, cele i opis zajęć/ <i>Aims, objectives and description of the course:</i>	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.		
Formy dydaktyczne, liczba godzin/ <i>Teaching forms, number of hours:</i>	a) lectures; number of hours - 15 b) laboratory classes; number of hours 15		
Metody dydaktyczne/ <i>Teaching methods:</i>	Lectures – multimedia presentations Laboratory classes – stereomicroscope observation of life and preserved pests and their natural enemies; preparation of chosen insect species; identification of plant injuries; completion of exercise books; individual projects; consultations		
Wymagania formalne i założenia wstępne/ <i>Formal requirements and prerequisites</i>	Basic knowledge on invertebrate animals and botany		
Efekty uczenia się/ <i>Learning outcomes:</i>	Treść efektu przypisanego do zajęć/ <i>the content of the effect assigned to the course:</i>		Odniesienie do efektu kierunkowego / <i>Relation to the course outcomes</i>
Wiedza (absolwent zna i rozumie) <i>/Knowledge: (the graduate knows and understands)</i>	W1	01 – knows and understands the principles of integration of non-chemical methods in Integrated plant protection (IPM) 02 – knows and understands the key principles allowing for the identification of the most economically important pests	K_W10 K-W09 2
Umiejętności (absolwent potrafi) <i>/Skills: (the graduate is able to)</i>	U1	03 – is able to 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 04 – is able to 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	K_U14 K_U20 K_U22 K_U21 2
Kompetencje (absolwent jest gotów do) <i>/Competences: (The graduate is ready to)</i>	K1	05 – is ready to update and broaden their knowledge and skills 06 – is ready to develop and implement non-chemical methods before the application of synthetic pesticides becomes necessary	K_K01 K_K02 2
<i>Treści programowe zapewniające uzyskanie efektów uczenia się: /Program contents ensuring the achievement of the learning outcomes:</i>	<p>The lectures will focus on: 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 (a) pest prevention methods (quarantine, agro-technical treatments, mixed crops, resistant crops) and (b) interventional methods (mechanical, physical, biological, chemical) to decrease pest population density; Presenting integrated pest management (IPM) methods based on case studies;</p> <p>Practical laboratory classes: 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; Preparing individual reports based on own experimental data and/or literature.</p>		

Sposób weryfikacji efektów uczenia się/ <i>Methods of the verification of the learning outcomes:</i>	Effects 01, 02 - tests written during classes Effects 04, 06 – the report on an indicated subject Effects 01-06 – the student’s activity during discussions on an indicated subject Effects 01-03 - the final written exam
Szczegóły dotyczące sposobów weryfikacji i form dokumentacji osiągniętych efektów uczenia się <i>/Details on the verification methods and of the ways of documenting the learning outcomes:</i>	The results of ongoing evaluation, written exam, and presentations on indicated subjects given during practical classes
Elementy i wagi mające wpływ na ocenę końcową/ <i>Elements and weights influencing the final grade:</i>	<ol style="list-style-type: none"> 1) a grade for tests written during practical classes 2) a grade for the final written exam 3) a grade for the report/presentation on an indicated subject 4) a grade for the student’s activity <p>The student can receive 100 points for each of the final grade components. The weight of each of the elements: 1) – 30%; 2) - 50%; 3) – 15%; 4) – 5%. To pass the student must receive at least 51% of points for components 1 and 2. The final mark is the sum of points received in each of the components (taking into consideration their individual weight). To pass the student must receive at least 51% of the total sum of points of all the components together.</p>
Miejsce realizacji zajęć/ <i>Teaching place:</i>	Lecture room; Laboratory
Literatura/Literature: 1. Boczek J., Lewandowski M. 2016. Nauka o szkodnikach roślin uprawnych; Boczek J. 1992. Niechemiczne metody zwalczania szkodników roślin; 3. Matyaszczuk i wsp. 2010. Wybrane zagadnienia ochrony roślin w rolnictwie ekologicznym i integrowanej ochronie roślin; 4. Tomalak M. 2005. Rolnictwo ekologiczne nowym wyzwaniem dla biologicznych metod ochrony roślin. 5. Tomalak M. i wsp. 2010. Tendencje rozwoju metod biologicznych w ochronie roślin.	
UWAGI/ANNOTATIONS To calculate the final grade below scale will be used: 100-91% - 5.0; 90-81% - 4.5; 80-71% - 4.0; 70-61% - 3.5; 60-51% - 3.0	

**) 3 – zaawansowany i szczegółowy, 2 – znaczący, 1 – podstawowy/ 3 – significant and detailed, 2 – considerable, 1 – basic,*

Wskaźniki ilościowe charakteryzujące moduł/przedmiot/*Quantitative summary of the course:*

Szacunkowa sumaryczna liczba godzin pracy studenta (kontaktowych i pracy własnej) niezbędna dla osiągnięcia zakładanych dla zajęć efektów uczenia się - na tej podstawie należy wypełnić pole ECTS / <i>Estimated number of work hours per student (contact and self-study) essential to achieve the presumed learning outcomes - basis for the calculation of ECTS credits:</i>	55 h
Łączna liczba punktów ECTS, którą student uzyskuje na zajęciach wymagających bezpośredniego udziału nauczycieli akademickich lub innych osób prowadzących zajęcia/ <i>Total number of ECTS credits accumulated by the student during contact learning:</i>	1.2 ECTS