

Nazwa zajęć/ <i>Course title:</i>	Herbologia	ECTS	4
Nazwa zajęć w j. angielskim/ <i>Course title in English:</i>	Herbology		
Zajęcia dla kierunku studiów/ <i>Degree program name:</i>	Biotechnology		

Język kursu/ <i>Course language:</i> English		Poziom studiów/ <i>Study level:</i> I	
Typ studiów/ <i>Form of studies:</i> x intramural .. extramural	Status zajęć/ <i>Course status</i> podstawowe/ <i>Basic</i> x kierunkowe/ <i>major</i>	obowiązkowe/ <i>mandatory</i> X do wyboru/ <i>elective</i>	Semestr/ <i>Semester:</i> 6 semestr zimowy/ <i>winter semester</i> x semestr letni/ <i>summer semester</i>
Rok akademicki/ <i>Academic year:</i>		2022/2023	Numer katalogowy/ <i>Catalogue number:</i> BBT_BTa-1S-6L-47_8

Koordinator zajęć/ <i>Course coordinator:</i>	Dr Marta Stankiewicz-Kosyl			
Prowadzący zajęcia/ <i>Teachers responsible for the course:</i>	Dr Mariola Wrochna			
Założenia, cele i opis zajęć/ <i>Aims, objectives and description of the course:</i>	<p>To acquaint students with the knowledge of the biology and competition of weeds occurring in plant crops. Presentation of control methods, especially chemical methods based on herbicides: their proper application and the fate of these substances in the plant and the environment</p> <p>Lectures: Introduction. The positive role of weeds. Weed biology, with particular emphasis on weed resistance to herbicides. Agrotechnical, mechanical, physical and biological methods of weed control. Chemical methods of weed control. Behavior of herbicides in soil. Ingress and metabolism of herbicides in the plant. Mechanisms of action of herbicides. Natural herbicides. Photodynamic herbicides. Acetolactate synthesis inhibitors. Adjuvants. - substances supporting the action of foliar and soil herbicides. Ecological infrastructure.</p> <p>Classes: Introduction to herbology; weed competition test. Outdoor activities. Weed seed studies. Characteristics of perennial and short-term weeds, ecological groups of field weeds, allelopathy test. Identification of weed species at various stages of development. Chemical and non-chemical methods of fighting weeds, test for the penetration of foliar herbicides into the plant. Characteristics of herbicides from various chemical groups. Commentary on the Plant Protection Program.</p>			
Formy dydaktyczne, liczba godzin/ <i>Teaching forms, number of hours:</i>	<p>a) Lectures; number of hours 15</p> <p>b) Auditorium classes; number of hours 25; Field exercises; number of hours 5;</p>			
Metody dydaktyczne/ <i>Teaching methods:</i>	Audio-visual methods, experiments carried out directly by the student in teams, analysis and interpretation of the obtained results, discussion and problem solving, consultations, preparation of a herbarium, collecting seeds, the possibility of using distance learning when necessary			
Wymagania formalne i założenia wstępne/ <i>Formal requirements and prerequisites</i>	Botany, molecular biology, plant physiology, biochemistry; The student should have knowledge of botany, molecular biology and plant physiology. He should be able to carry out a simple experiment on plant material.			
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>	Siła dla ef. kier*/ <i>Impact on the course outcomes*</i>
Wiedza (absolwent zna i rozumie) / <i>Knowledge: (the graduate knows and understands)</i>	W1	the student is able to recognize the weeds that are the most common in our agriculture	K_W09 K_W10	3 3
	W2	the student has mastered basic knowledge in the field of biology and weed competition	K_W09 K_W10 K_W06 K_W08	3 3 3 3
Umiejętności (absolwent potrafi) / <i>Skills: (the graduate is able to)</i>	U1	the student is able to propose a method of weed control appropriate to the state of weed infestation	K_U02 K_U07 K_U14 K_U04	2 2 3 2
	U2	the student can explain the molecular mechanism of weed resistance to herbicides	K_U14 K_U04 K_U17	3 2 3
Kompetencje (absolwent jest gotów do) / <i>Competences: (The graduate is ready to)</i>	K1	It is ready to predict the extent of the negative impact of chemical methods on plants and the environment.	K_K06 K_K03	2 3
Treści programowe zapewniające uzyskanie efektów uczenia się: / <i>Program contents ensuring the achievement of the learning</i>	Acquainting with the biology of selected weeds, techniques for their elimination from crops and the mechanism of acquiring weed resistance to herbicides.			

outcomes:	
Sposób weryfikacji efektów uczenia się/ <i>Methods of the verification of the learning outcomes:</i>	W1 effect - recognition of seeds and whole plants of selected species of weeds at various stages of development, Effect W2, U1-2, K1 - test on the exercise material Effect W2, U1-2, K1 - activity during exercises Effect W2, U1-2, K1 - exam the possibility of using distance learning when necessary
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>	An individual student card with grades from the colloquium and exam as well as activity in the classroom, the possibility of using distance learning when necessary;
Elementy i wagi mające wpływ na ocenę końcową/ <i>Elements and weights influencing the final grade:</i>	Colloquium on the exercise material (40%), identification of seeds and plants (10%). Student involvement during classes (10%). Exam (40%)
Miejsce realizacji zajęć/ <i>Teaching place:</i>	Didactic room, laboratory and the Experimental Greenhouse ZPPO, WOIB
Literature / <i>Literature:</i>	1. Woźnica Z. 2008. Herbolgia, PWRiL, Poznań, 2. Praczyk T., Skrzypczak G. 2004. Herbicydy, PWRiL, Poznań, 3. Skrzypczak G., Blecharczyk A., Swędrzyński A. 2007. Podręczny atlas chwastów. Wydawnictwo Multum, Poznań, 4. Stankiewicz M., Gadamski G., Gawroński S.W. 2001. Spreading of triazine-resistant biotype of <i>Solanum nigrum</i> L. – analysis using RAPD markers. <i>Weed Research</i> 41:287-300, 5. Krysiak M., Gawroński S.W., Adamczewski K., Kierzek R. 2011. ALS gene mutations in <i>Apera spica-venti</i> confer broad-range resistance to herbicides. <i>Journal of Plant Protection Research</i> 51(3):261-267, 6. Cegiełkowska W. Gawroński S.W. 2009. Uciążliwe chwasty wieloletnie w rolnictwie ekologicznym. <i>Postępy Nauk Rolniczych</i> 61 (3/4): 111-125, 7. Dobrzański A. 1999. Ochrona warzyw przed chwastami. PWRiL, Warszawa
UWAGI/ANNOTATIONS	The following scale is used to calculate the final score: 100-91% points - 5.0, 90-81% points - 4.5, 80-71% points - 4.0 70-61% points - 3.5, 60-51% points - 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>	113 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>	1.8 ECTS