

Nazwa zajęć/ <i>Course title:</i>	Fizjologia roślin	ECTS	4
Nazwa zajęć w j. angielskim/ <i>Course title in English:</i>	Plant physiology		
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>
		X obowiązkowe/ <i>mandatory</i> do wyboru/ <i>elective</i>	Semestr/ <i>Semester:</i> 3
			x semestr zimowy/ <i>winter semester</i> semestr letni/ <i>summer semester</i>
Rok akademicki/ <i>Academic year:</i>		2022/2023	Numer katalogowy/ <i>Catalogue number:</i> BBT_BTa-1S-3Z-25

Koordynator zajęć/ <i>Course coordinator:</i>	Prof. dr hab. Agnieszka Gniazdowska-Piekarska			
Prowadzący zajęcia/ <i>Teachers responsible for the course:</i>	Prof. dr hab. Stanisław Karpiński, employees of the Department of Plant Physiology: dr Krystyna Oracz, dr Katarzyna Cjekka, dr Paweł Staszek			
Założenia, cele i opis zajęć/ <i>Aims, objectives and description of the course:</i>	<p>Introducing students to basic life processes, from the molecular level to the level of the organism, compounds of plant structure and functioning, mechanisms of regulation and coordination of life processes during plant growth and development, the influence of external and internal factors on these processes.</p> <p>Topics of the lectures: photosynthesis and respiration, transport and distribution of assimilates, water management of the plant cell and the whole plant as well as mineral nutrition, structure and function of plant hormones, differentiation and development of plants, characteristics of plant development phases and the influence of the environment on their course, plant resistance to unfavorable factors the environment.</p> <p>Exercise topics: water management (osmosis); photosynthesis and assimilation pigments; breathing and photorespiration; mineral plant nutrition; regulators of plant growth and development, plant movements.</p>			
Formy dydaktyczne, liczba godzin/ <i>Teaching forms, number of hours:</i>	<p>a) Lecture number of hours ... 40</p> <p>b) Laboratory classes number of hours 20</p>			
Metody dydaktyczne/ <i>Teaching methods:</i>	Lecture, laboratory exercises, discussion with the use of distance learning methods			
Wymagania formalne i założenia wstępne/ <i>Formal requirements and prerequisites</i>	Botany, Biochemistry Knowledge of the basic physiological processes in plants and the basics of their regulation.			
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	knows the course and understands the interdependencies between the basic physiological processes	K_W04 K_W05 K_W06 K_W07	2 1 2 2
	W2	knows the mechanisms of regulation of physiological processes at the cellular, tissue and whole organism levels, taking into account internal and external factors	K_W05 K_W06 K_W07	1 2 2
	W3	knows how to define and classify plant responses to unfavorable environmental factors and knows how to propose ways to improve plant tolerance to stressors	K_W03 K_W13	3 2
Umiejętności (absolwent potrafi) <i>/Skills: (the graduate is able to)</i>	U1	can use methods of measuring selected parameters describing physiological processes	K_U01 K_U02 K_U05 K_U06 K_U16	3 1 2 1 1
	U2	performs simple experiments, collates and interprets their results	K_U04 K_U05 K_U06 K_U16 K_U17 K_U21	3 2 1 1 3 2

Kompetencje (absolwent jest gotów do) /Competences: (The graduate is ready to)	K1	is ready to work as a team in carrying out exercises and preparing presentations	K_K01 K_K02 K_K06	3 2 3
	K2	is ready to apply safety rules in laboratory work and to demonstrate responsibility for the equipment and apparatus used	K_K03	3
Treści programowe zapewniające uzyskanie efektów uczenia się: /Program contents ensuring the achievement of the learning outcomes:		Life processes from the molecular level to the organism level, relationships between plant structure and functioning, mechanisms of regulation and coordination of life processes during plant growth and development, the influence of external and internal factors on these processes. Issues such as: photosynthesis and respiration, transport and distribution of assimilates, water management of the plant cell and the whole plant, and mineral nutrition, structure and function of plant hormones, plant differentiation and development, characteristics of plant development phases and the influence of the environment on their course, plant resistance to unfavorable conditions environmental factors.		
Sposób weryfikacji efektów uczenia się/ Methods of the verification of the learning outcomes:		written test during classes, observation and evaluation of speeches and presentation of a defined problem during classes, observation of activity during laboratory classes, written exam,		
Szczegóły dotyczące sposobów weryfikacji i form dokumentacji osiągniętych efektów uczenia się /Details on the verification methods and of the ways of documenting the learning outcomes:		Personal evaluation cards of the student, the content of the test questions with the assessment, the content of the exam questions with the assessment. In the case of tests and an exam in a remote form - a sheet from the MS Forms application.		
Elementy i wagi mające wpływ na ocenę końcową/Elements and weights influencing the final grade:		Assessment criteria: written test and presentation. The student has to pass the test. Final assessment of exercises 90% test, 10% presentation. Conditions for passing the lecture: the student must complete the exercises before taking the exam. Written exam in the form of a multiple-choice test. The test consists of 50% of questions from the lectures of prof. Karpiński and 50% of the lectures of prof. Gniazdowska-Piekarska. The exam is passed when the student obtains a positive mark for each part of the exam. The final exam grade is the arithmetic mean of both grades. The final grade is the arithmetic mean of the exercises and the exam.		
Miejsce realizacji zajęć/ Teaching place:		Laboratory room, lecture room, in the case of a remote or mixed course, an application for remote communication		
Literatura podstawowa i uzupełniająca: Fizjologia roślin, red. J. Kopcewicz, S. Lewak, PWN Warszawa 2002, Fizjologia roślin wprowadzenie red. S. Lewak, J. Kopcewicz, PWN Warszawa 2009, Fizjologia roślin red. M. Kozłowska, PWRiL, Poznań 2007, Przewodnik do ćwiczeń z fizjologii roślin red. Z. Starck, Wyd. SGGW 2007 Literatura uzupełniająca: Taitz L., Zeiger E. 2005. Plant Physiology. Eds. Sinauer Associates, Sunderland, Hopkins W.G., Huner N. P. A. 2004.				
UWAGI/ANNOTATIONS Do wyciszenia oceny końcowej stosowana jest następująca skala: 100-91% pkt - 5,0; 90-81% pkt - 4,5; 80-71% pkt - 4,0; 70-61% pkt - 3,5; 60-51% pkt - 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 /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:	102h
Łączna liczba punktów ECTS, którą student uzyskuje na zajęciach wymagających bezpośredniego udziału nauczycieli akademickich lub innych osób prowadzących zajęcia/ Total number of ECTS credits accumulated by the student during contact learning:	2.4 ECTS