

## KARTA PRZEDMIOTU

### I. Dane podstawowe

Nazwa przedmiotu	Plant physiology
Nazwa przedmiotu w języku angielskim	Plant physiology
Kierunek studiów	biotechnology
Poziom studiów (I, II, jednolite magisterskie)	BSc
Forma studiów (stacjonarne, niestacjonarne)	part-time
Dyscyplina	Biological sciences
Język wykładowy	English

Koordinator przedmiotu/osoba odpowiedzialna	Dr hab. Ewa Skórzyńska-Polit
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Forma zajęć ( <i>katalog zamknięty ze słownika</i> )	Liczba godzin	semestr	Punkty ECTS
wykład	30 ( 30 remote)	III	6 ( 2 remote)
konwersatorium			
ćwiczenia	45	III	
laboratorium			
warsztaty			
seminarium			
proseminarium			
lektorat			
praktyki			
zajęcia terenowe			
pracownia dyplomowa			
translatorium			
wizyta studyjna			

Wymagania wstępne	knowledge from the course Basics cytophysiology and ontogenesis, Basic taxonomy
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### II. Cele kształcenia dla przedmiotu

To familiarize students with the course of life processes during plant ontogeny, phenomena occurring in the living plant and processes which are responsible for these phenomena.
Getting to know the mechanisms regulating physiological processes at all levels of biological organization, i.e. molecular, cellular, organs and the whole organism
Familiarization with laboratory work techniques.

### III. Efekty uczenia się dla przedmiotu wraz z odniesieniem do efektów kierunkowych

Symbol	Opis efektu przedmiotowego	Odniesienie do efektu kierunkowego
<b>WIEDZA</b>		
W_01	The student presents knowledge about the cell function and structures, organs and whole plants and as well as metabolic processes in plants	K_W01
W_02	presents knowledge connected with laboratory techniques and research tools to study the mechanisms of plant tolerance to environmental stress	K_W05
W_03	is able to characterize individual regulators of plant growth and development in terms of their functions, and has knowledge of their practical use in biotechnological processes used in agriculture, describes the impact of environmental conditions on changes in the functioning of higher plants	K_W08
W_04	presents health and safety rules in the laboratory	K_W09
<b>UMIEJĘTNOŚCI</b>		
U_01	The student plans and carries out experiments connected with physiological processes occurring in plants, he/she verifies the obtained results with theoretical knowledge	K_U01, K_U03, K_U15
U_02	The student examines the plant material for the determination, among others, its compounds and enzymatic activities, and interprets the obtained results	K_U02
U_03	The student reads the specialist literature with understanding, prepares a written study including issues in the field of plant physiology used in biotechnology	K_U13, U_17
<b>KOMPETENCJE SPOŁECZNE</b>		
K_01	Student shows responsibility for entrusted equipment and his own work, respects for his or her own work and others, knows how to work with chemicals	K_K04

### IV. Opis przedmiotu/ treści programowe

Water and plant cell, water balance of plants. Passive and active exchange of compounds and minerals between cell and the environment Mineral nutrition, essential nutrients. Up taking and transport of minerals. Assimilation of mineral nutrients. Photosynthesis. C3, C4 and CAM plants, synthesis of organic compounds Chemosynthesis. Respiration, fermentations and others catabolic processes. Plant growth regulators. Plant movements. Plant responses to the environmental stress factors.

### V. Metody realizacji i weryfikacji efektów uczenia się

Symbol efektu	Metody dydaktyczne <i>(lista wyboru)</i>	Metody weryfikacji <i>(lista wyboru)</i>	Sposoby dokumentacji <i>(lista wyboru)</i>
<b>WIEDZA</b>			

W_01	Conventional lecture, Conversational lecture	Test / Written test/Exam	Protocol/ Evaluated test
W_02	Conventional lecture, Conversational lecture	Test / Written test/Exam	Protocol/ Evaluated test
W_03	Conventional lecture, Conversational lecture	Test / Written test/Exam	Protocol/ Evaluated test
W_04	Laboratory analysis	Observation	Observation report
<b>UMIEJĘTNOŚCI</b>			
U_01	Laboratory classes	Report	report printout/ report file
U_02	Laboratory classes Practical classes	Report	report printout/ report file
U_03	Discussion	Observation	Observation report
<b>KOMPETENCJE SPOŁECZNE</b>			
K_01	Laboratory classes	Observation	Observation report

#### VI. Kryteria oceny, wagi...

The marks from the written test, colloquium as well as reports and observations are taken into account. The indicated level of knowledge applies to each assessed element.

<b>Mark</b>	<b>Evaluation criteria</b>	
<b>very good (5)</b>	the student realizes the assumed learning outcomes at a very good level	the student demonstrates knowledge of the education content at the level of 91-100%
<b>overgood (4.5)</b>	the student accomplishes the assumed learning outcomes an over good level	the student demonstrates knowledge of the education content at the level of 86-90 %
<b>good(4)</b>	the student accomplishes the assumed learning outcomes at a good level	the student demonstrates knowledge of the education content at the level of 71-85%
<b>quite good(3.5)</b>	the student accomplishes the assumed learning outcomes at a quite good level	the student demonstrates knowledge of the education content at the level of 66-70%
<b>sufficient (3)</b>	the student accomplishes the assumed learning outcomes at a sufficient level	the student demonstrates knowledge of the education content at the level of 51-65%
<b>insufficient (2)</b>	the student accomplishes the assumed learning outcomes at an insufficient level	the student demonstrates knowledge of the education content below the level of 51%

#### VII. Obciążenie pracą studenta

Forma aktywności studenta	Liczba godzin
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Liczba godzin kontaktowych z nauczycielem	75 ( 30 remote)
Liczba godzin indywidualnej pracy studenta	75 ( 20 preparation for remote hours)

#### **VIII.** Literatura

Literatura podstawowa
1. Taiz L., Zeiger E. Plant Physiology Fifth Edition, Sinauer Associates Inc.,U.S. 2010.
2. Taiz L., Zeiger E., Moller I.M., Murphy A. Plant Physiology and development, Sixth edition, 2015
Literatura uzupełniająca
1. Hopkins W.G., Huner N.P.A. Introduction to plant physiology 4th edition 2008