KARTA PRZEDMIOTU

I. Dane podstawowe

Nazwa przedmiotu	Fizjologia roślin
Nazwa przedmiotu w języku angielskim	Plant physiology
Kierunek studiów	Biotechnologia
Poziom studiów (I, II, jednolite magisterskie)	I
Forma studiów (stacjonarne, niestacjonarne)	stacjonarne
Dyscyplina	biologia
Język wykładowy	Grupy w języku polskim – język polski Grupy w języku angielskim – język angielski

Koordynator przedmiotu/osoba odpowiedzialna	Dr hab. Ewa Skórzyńska-Polit

Forma zajęć *(katalog zamknięty ze słownika)*	Liczba godzin	semestr	Punkty ECTS
wykład	30	III	6
konwersatorium			
ćwiczenia	30	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

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 kształcenia dla przedmiotu wraz z odniesieniem do efektów kierunkowych

Symbol	Opis efektu przedmiotowego	Odniesienie do efektu kierunkowego
WIEDZA		
W_01	The student has knowledge of the structure and functioning of a single plant cell and plant organism as a whole	K_W01
W_02	is able to explain the impact of environmental conditions on changes in the functioning of higher plants, as well as define the basic concepts and describe the physiological mechanisms underlying plant tolerance to environmental stress	K_W01
W_03	is able to characterize individual regulators of plant growth and development in terms of their functions, and also has knowledge about their use in agricultural practice	K_W02
W_04	The student has knowledge on basic research techniques used to describe the physiological processes in plants, knows the safety rules in force in the lab	K_W06, KW_09
UMIEJĘTNOŚCI		
U_01	The student carries out experiments related to the basic physiological processes occurring in plants, is able to verify the obtained results with theoretical knowledge	K_U01, K_U02, K_U03, K_U05
U_02	interprets the relationship between the plant organism and the surrounding environment, and assesses the mechanisms underlying the adaptation of plant organism to the changing conditions of plant growth and development, including the impact of growth regulators on these processes	K_U07
U_03	is able to analyze plant material for determining, inter alia compounds and the enzymatic activities contained therein and to interpret the obtained results	K_U01, K_U02
U_04	The student reads and understands professional literature, prepares a written report/study related to plant physiology	K_U07, U_10
KOMPETENCJE SPOŁECZNE		
K_01	The student displays an interest in phenomena occurring in living plant	K_K01
K_02	shows responsibility for entrusted equipment and his own work, respects for his or her own work and others	K_K02
K_03	The student has the ability to work in a team and safe handling of chemicals	K_K02, K_K03

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 kształcenia

Symbol efektu	Metody dydaktyczne *(lista wyboru)*	Metody weryfikacji *(lista wyboru)*	Sposoby dokumentacji *(lista wyboru)*
WIEDZA			
W_01	Conventional lecture, Conversational lecture	Written Test / Written exam	Evaluated test / written test
W_02	Conventional lecture, Conversational lecture	Written Test / Written exam	Evaluated test / written test
W_03	Conventional lecture, Conversational lecture	Written Test / Written exam	Evaluated test / written test
W_04	Laboratory analysis	Observation	Observation report
UMIEJĘTNOŚCI			
U_01	Laboratory classes	Report	report printout/ report file
U_02	Laboratory classes Practical classes	Report	report printout/ report file
U_03	Laboratory classes Practical classes	Report	report printout/ report file
U_04	discussion	Observation	Observation report
KOMPETENCJE SPOŁECZNE			
K_01	Laboratory classes	Observation	Observation report
K_02	Laboratory classes	Observation	Observation report
K_03	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.

Mark	**Evaluation criteria**	
very good (5)	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%
overgood (4.5)	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 %
good(4)	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%
quite good(3.5)	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%

sufficient (3)	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%
insufficient (2)	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
Liczba godzin kontaktowych z nauczycielem	**60**
Liczba godzin indywidualnej pracy studenta	**90**

VIII. Literatura

Grupy w języku polskim

Literatura podstawowa
Fizjologia roślin, Kopcewicz J. 2012. Państ. Wydaw. Rolnicze i Leśne, Warszawa. Fizjologa roślin. Szwejkowska A. 2002. Wydaw. Nauk. UAM, Poznań. Podstawy biologii komórki roślinnej, pod red. Woźnego A. 2000. Wydaw. Nauk. UAM, Poznań, Regulatory wzrostu i rozwoju roślin. Tom1 i 2– pod red. Jankiewicz LS. 1997. PWN, Warszawa
Literatura uzupełniająca
Fizjologia roślin. Czerwiński W. 1981. PWN, Warszawa. Taiz L., Zeiger E. Plant Physiology Fifth Edition, Sinauer Associates Inc.,U.S. 2010. Artykuły w czasopismach: Postępy biologii komórki, Postępy biochemii, Kosmos, Journal of Plant Physiology, Trends in Plant Science

Grupy w języku angielskim

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