

## Course Syllabus

### I. General Information

Course name	Plant physiology
Programme	Biotechnology
Level of studies (BA, BSc, MA, MSc, long-cycle MA)	BSc
Form of studies (full-time, part-time)	part-time
Discipline	Biological sciences
Language of instruction	English

Course coordinator/person responsible	Dr hab. Ewa Skórzyńska-Polit
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Type of class ( <i>use only the types mentioned below</i> )	Number of teaching hours	Semester	ECTS Points
lecture	30	III	6
tutorial			
classes	30	III	
laboratory classes			
workshops			
seminar			
introductory seminar			
foreign language classes			
practical placement			
field work			
diploma laboratory			
translation classes			
study visit			

Course pre-requisites	knowledge from the course Basics cytophysiology and ontogenesis, Basic taxonomy
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### II. Course Objectives

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. Course learning outcomes with reference to programme learning outcomes

Symbol	Description of course learning outcome	Reference to programme learning outcome
<b>KNOWLEDGE</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 also has knowledge about their use in agricultural practice, 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>SKILLS</b>		
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
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 plans and carries out experiments connected with physiological processes occurring in plants, he/she verifies the obtained results with theoretical knowledge	K_U03, K_U15
U_04	The student reads and understands professional literature, prepares a written report/study related to plant physiology	K_U13, U_17
<b>SOCIAL COMPETENCIES</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. Course Content

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. Uptake and transport of minerals. Assimilation of mineral nutrients. Photosynthesis. C3, C4 and CAM plants, synthesis of organic compounds Chemosynthesis. Respiration, fermentations and other catabolic processes. Plant growth regulators. Plant movements. Plant responses to the environmental stress factors

### V. Didactic methods used and forms of assessment of learning outcomes

Symbol	Didactic methods (choose from the list)	Forms of assessment (choose from the list)	Documentation type (choose from the list)
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KNOWLEDGE			
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
SKILLS			
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
SOCIAL COMPETENCIES			
K_01	Laboratory classes	Observation	Observation report

#### VI. Grading criteria, weighting factors.....

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	
<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. Student workload

Form of activity	Number of hours
Number of contact hours (with the teacher)	60
Number of hours of individual student work	90

### VIII. Literature

Basic literature
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
Additional literature
Hopkins W.G., Huner N.P.A. Introduction to plant physiology 4th edition 2008