

**Subject card**

<b>Subject name and code</b>	Molecular plant physiology, PG_00147014						
<b>Field of study</b>	Genetics and Experimental Biology						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>			2027/2028		
<b>Education level</b>	Bachelor's studies	<b>Subject group</b>			Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	2	<b>Language of instruction</b>			Polish		
<b>Semester of study</b>	3	<b>ECTS credits</b>			2.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>			credit		
<b>Conducting unit</b>	Department of Experimental Biology and Plant Biotechnology -> Faculty of Biology -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr hab. Wojciech Pokora				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	0.0	0.0	30.0	0.0	0.0	30
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	30		5.0		15.0	50
<b>Subject objectives</b>	Prepare students to conduct basic research in plant molecular physiology.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GBEL3_U07] The graduate is able to: work as part of a team and organise work in accordance with the principles of occupational health and safety and ergonomics.	Graduate is able to work in a team and organize work	[SU8] observation of student's independent or team work
	[GBEL3_U03] The graduate is able to: use research apparatus and tools and, following the correct sequence of operations, carry out simple physical, biological or chemical observations and measurements in laboratory work in the biological sciences.	Graduate uses basic apparatus and research tools maintaining the correct sequence of operations, performs simple physical, biological or chemical observations and measurements in laboratory work in the field of biological sciences	[SU1] oral statement/conversation/discussion [SU6] demonstration of practical skills
	[GBEL3_U01] The graduate is able to: independently perform practical tasks in the biological and related sciences, formulate research problems, analyse their results and draw conclusions.	Graduate can independently perform simple practical tasks in the field of physiology molecular physiology of plants.	[SU6] demonstration of practical skills
	[GBEL3_K05] The graduate is prepared to: responsibility for their own and others' safety at work	The graduate is responsible for the safety of his own work and that of others	[SK8] observation of student's independent or team work
	[GBEL3_K02] The graduate is prepared to: critically evaluate their own knowledge and methods in molecular biology and related fields and commercialise their research.	The graduate is ready to critically evaluate methods in the field of molecular physiology plants	[SK1] oral statement/conversation/discussion
[GBEL3_K01] The graduate is prepared to: use of theoretical knowledge in laboratory and production practice	The graduate is ready to apply theoretical knowledge in laboratory and production practice	[SK6] demonstration of practical skills	
Subject contents	Properties of chloroplast pigments, functioning of the photosynthetic apparatus under stress, Water management of plant cells and tissues, plant movements, hormonal regulation, assimilation and metabolism of nitrogenous compounds.		
Prerequisites and co-requisites	lack		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	performance of practical work	51.0%	50.0%
	interpretation and discussion of results	51.0%	25.0%
	written credit for a batch of material (entrance exam)	51.0%	25.0%
Recommended reading	Basic literature	<p>Buchanan, Grisse, Jones (red.), 2015. Biochemistry and molecular biology of Plants, Willey Balacwell.</p> <p>Szmidt-Jaworska, Kopcewicz J.(red.). 2020. Fizjologia roślin. Wyd. PWN, Warszawa</p> <p>Taiz L., Zeiger E. (red.). 2010. Plant physiology. The Benjamin/ Cummings Publ. Comp. Inc.</p> <p>Tukaj Z. (red.). 2012. Przewodnik do ćwiczeń z fizjologii roślin. Wyd. Uniwersytetu Gdańskiego</p>	

	Supplementary literature	<p>Scientific publications in experimental biology and molecular physiology of plants</p> <p>Pokora, W., Aksmann, A., Baścik-Remisiewicz, A., Dettlaff-Pokora, A., Rykaczewski, M., Gappa, M., and Tukaj, Z. Changes in nitric oxide/hydrogen peroxide content and cell cycle progression: Study with synchronized cultures of green alga <i>Chlamydomonas reinhardtii</i>. <i>Journal of Plant Physiology</i> (2017) 208, 8493. Renberg L., Johansson A. I., Shutova T., Stenlund H., Aksmann A., Raven J. A., Gardeström P., Moritz T. &amp; G. Samuelsson A Metabolomic Approach to Study Major Metabolite Changes during Acclimation to Limiting CO<sub>2</sub> in <i>Chlamydomonas reinhardtii</i>. <i>Plant Physiol.</i> 154(1): 187+196. Wilmowicz E., Kućko A., Pokora W., Kapusta M., Jasieniecka-Gazarkiewicz K., Tranbarger T.J., Wolska M., Panek K. EPIP-Evoked Modifications of Redox, Lipid, and Pectin Homeostasis in the Abscission Zone of Lupine Flowers. <i>Int. J. Mol. Sci.</i> 2021 (22), 3001.</p>
Example issues/ example questions/ tasks being completed	eResources addresses	
Work placement	Not applicable	

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