University of Gdańsk

Subject card

Subject name and code	Plant biotechnology, PG_00048685		
Field of study	Biotechnologia roślin (Ćw. laboratoryjne)		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
Education level	Bachelor's studies	Subject group	Optional subject group
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	5	ECTS credits	1.0
Learning profile	academic	Assessment form	credit
Conducting unit	Laboratory of Plant Biotechnology -> Department of Experimental Biology and Plant Biotechnology -> Faculty of Biology -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Monika Majewska	
	Teachers	dr Monika Majewska	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	15.0	0.0	0.0	15

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	15	0.0	0.0	15

Subject objectives

1. Familiarizing students with the role of genetically modified plants in the development of biological sciences as well as in the emergence of new fields and research disciplines.

2. Introducing students to the principles of establishing and maintaining plant in vitro cultures.

3. Familiarizing and training students in the planning, establishment, maintenance, analysis, and documentation of plant in vitro cultures, as well as in the creation of genetically modified plants using selected examples; demonstrating the practical applications of plant in vitro cultures and GMO plants in human life (agriculture, horticulture).

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOLL3_W14] the graduate knows the theoretical basis of experimental methods and the most important techniques of the biological sciences	The graduate is able to explain the theoretical foundations of experimental methods and the key techniques applied in the establishment of plant in vitro cultures and in the creation of genetically modified plant organisms	[SW5] realizacja zadania problemowego
[BIOLL3_K01] the graduate is ready to evaluate his/her own knowledge and understands the need for continuous learning and development and is open to new ideas	The graduate is aware of the limitations of their own knowledge and understands the need for continuous learning and development, and is open to new ideas.	[SK1] wypowiedź ustna/rozmowa/ dyskusja
[BIOLL3_W10] the graduate is familiar with the development and current state of knowledge and the latest trends in biology, as well as their relationship with other natural disciplines	The graduate is familiar with the development and current state of knowledge, as well as the latest trends in the field of plant biotechnology fundamentals, and is able to indicate their relationship with other natural science disciplines.	[SW1] wypowiedź ustna/rozmowa/ dyskusja
[BIOLL3_U07] the graduate is able to independently search and use available sources of biological information, including electronic sources	The graduate is able to independently search for and make use of available sources of biological information, including electronic resources	[SU1] wypowiedź ustna/rozmowa/ dyskusja [SU6] demonstracja umiejętności praktycznych

Subject contents

Basic methods for preparing, establishing, and maintaining *in vitro* cultures.
Isolation and evaluation of plant genomic DNA.
Plant transformation.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
completing a final assignment - completing a specific practical assignment	51.0%	40.0%
systematic assessment of the student's progress using laboratory documentation.	51.0%	20.0%
completion of the course assignment – project or presentation	51.0%	40.0%

Recommended reading

Basic literature

Malepszy, S. (ed.). 2009. *Plant Biotechnology*. PWN, Warsaw.

Kopcewicz, J. (ed.). 2007. *Plant Physiology*. PWN, Warsaw.

	Supplementary literature	• Loyola-Vargas, V.M., & Vázquez-Flota, F. (eds.). 2006. *Plant Culture Protocols.* In *Methods in Molecular Biology.* Humana Press, Totowa, New Jersey. • Neumann, K.-H., Kumar, A., Imani, J., Pua, E.-C., & Davey, M.R. 2009. *Plant Cell and Tissue Culture: A Tool in Biotechnology.* Springer Science & Business Media. • Kole, C. (ed.). 2010. *Plant Developmental Biology: Biotechnological Perspectives.* Springer. • (ed.) 2011. *Wild Crop Relatives: Genomic and Breeding Resources Oilseeds.* Springer. • Rojek, J., Tucker, M.R., Rychłowski, M., Nowakowska, J., & Gutkowska, M. 2021. The Rab Geranylgeranyl Transferase Beta Subunit Is Essential for Embryo and Seed Development in *Arabidopsis thaliana. International Journal of Molecular Sciences, 22*(15), 7907. https://doi.org/10.3390/ijms22157907 • Woźny, J., & Rojek, J. 2020. Qualitative and quantitative assessment of the effects of steroid hormones on obtaining and productivity of doubled haploid rapeseed. In T. Wysoczański (ed.), *Science, Research and Scientific Reports 2020: Natural and Medical Sciences* (Vol. 1, pp. 165175). Idea Knowledge Future. ISBN 978-83-953882-6-2. • Rojek, J., Pawełko, Ł., Kapusta, M., Naczk, A., & Bohdanowicz, J. 2015. Exogenous steroid hormones stimulate full development of autonomous endosperm in *Arabidopsis thaliana. Acta Societatis Botanicorum Poloniae, 84*, 287301.
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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