University of Gdańsk

Subject card

Subject name and code	Genetically modified organisms in environmental protection, PG_00103548		
Field of study	Environmental Protection		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
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	2.0
Learning profile	academic	Assessment form	credit
Conducting unit	Department of Molecular Genetics of Bacteria -> Faculty of Biology -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Barbara Kędzierska	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	30.0	0.0	0.0	30

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	30	5.0	15.0	50

Subject objectives

Knowledge of a variety of molecular biology techniques that enable the creation of genetically modified organisms and how they can be used in various environmental aspects. Ability to use basic molecular biology techniques and to analyze and interpret the results obtained.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OŚL3_U04] Uses specialist language in the discussion and properly uses the nomenclature in the field of environmental protection and individual disciplines related to it.	under the supervision of a tutor, using the instructions, conducts simple experiments in the field of molecular biology uses correct terminology in the field of molecular biology	[SU1] oral statement/conversation/ discussion [SU6] demonstration of practical skills
[OŚL3_K01] Behaves in a professional manner at all times; bears full responsibility for the actions taken relating to the protection of the environment and respects the principles of professional ethics and principles of intellectual honesty.	demonstrates the ability to work effectively in a team is responsible for the entrusted equipment/materials and respects his own work and that of others	[SK8] observation of student's independent or team work
[OŚL3_K05] Identifies the level of her/his knowledge and skills, demonstrates the need to update knowledge about the environment and its protection, demonstrates the need for continuous professional training and personal development.	recognizes the limitations of their own knowledge and understands the need for continuous learning is open to the use of modern molecular biology techniques in various areas of life, including environmental protection	[SK7] entries and opinions in the internship diary [SK8] observation of student's independent or team work

Subject contents

Genetic engineering techniques required to construct bacterial strains with novel properties: (1) Isolation of plasmid DNA, (2) Transformation of bacterial cells with plasmid DNA, (3) DNA amplification by PCR, (4) DNA digestion with restriction enzymes, (5) DNA agarose electrophoresis, (6) Use of reporter genes to monitor changes in promoter activity and expression of other genes.

Prerequisites and co-requisites	Courses in chemistry, general biology, microbiology, biochemistry Basic knowledge of chemistry and the ability to use it in the laboratory to properly prepare solutions, buffers, and maintain safety at work; ability to work sterile and conduct bacterial cultures; basic knowledge of nucleic acids and proteins.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
colloquia	51.0%	80.0%
activity in the class	51.0%	20.0%

Recommended reading

Basic literature	The exercises are based on numerous original publications and unpublished materials, their content is not included in any textbook • Krystyna Kowal, Zdzisława Libudzisz, Zofia Żakowska. Mikrobiologia techniczna. PWN 2023 • publications indicated by the lecturer • instructions for laboratory classes provided by the lecturer
Supplementary literature	Buchowicz J. Biotechnologia molekularna, PWN 2009 Klimiuk E, Łebkowska M. Biotechnologia w ochronie środowiska, PWN 2008
eResources addresses	

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable

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