University of Gdańsk

Subject card

Subject name and code	Alternative Bio-protection - lecture, PG_00192667		
Field of study	Marine Biotechnology		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	Master's studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	English
Semester of study	2	ECTS credits	1.0
Learning profile	academic	Assessment form	exam
Conducting unit	Office of the Dean of the Intercollegiate Faculty of Biotechnology -> Intercollegiate Faculty of Biotechnology UG-MUG -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. Robert Czajkowski	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	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	1.0	9.0	25

Subject objectives

The course will introduce the students to alternative biological control methods used to protect marine organisms from diseases in their natural environment (natural habitats). These methods include promising and novel biological control approaches such as (oral) vaccines, probiotics, bacteriophage therapy, and the application of light and photosensitizers (photodynamic inactivation) to minimize the impact of pathogens. Likewise, students will also be introduced to the issues of social aspects of industrial (marine) food, enzyme, metabolite production, and related risks

Learning outcomes

Course outcome	Subject outcome	Method of verification
[MBMU2-KK04] Is ready to assess and understand the risks and dilemmas, including ethical dilemmas associated with conducting scientific research and introduction of advanced technologies; understands and appreciates the importance of intellectual property; acts ethically	The student understands the ethical dilemmas and risks associated with conducting research in the field of marine biotechnology. The student understands the importance of intellectual property in marine biotechnology.	[SK4] test/exam - oral or written
[MBMU2-KW04] Knows and deeply understands advanced research methods used in marine biotechnology and related sciences	The student knows and understands the research methods used in marine biotechnology	[SW4] test/exam - oral or written

Subject contents	**Biological control:** - the idea of biological control / biological protection history, aim, examples - the concept of biological protection with the focus on marine (natural and artificial) environments **Bacteriophages:** - the discovery of viruses infecting bacteria, - the use of bacteriophages in therapy (from the past to the future) - marine environment as a source of valuable bacteriophage isolates and their enzymes - bacteriophage-centered biological control in (natural and artificial) marine environments **Vaccines:** - the history and significance of vaccinations - the basics of operation and production of classic and new generation vaccines - antibacterial and antiviral vaccines - vaccination of aquatic organisms, - the role of adjuvants with the focus on adjuvants of marine origin **Photobiology:** - basic biological mechanisms at the molecular level occurring under the influence of light - demonstration of photobiology's importance for biotechnology, medicine, and connection with other fields and disciplines of science. - characterization of modern research tools and measurement methods used in photobiology, related fields, and scientific disciplines.
Prerequisites and co-requisites	basic knowledge of microbiology, molecular biology and genetics
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
writtten test	51.0%	100.0%

Recommended reading	Basic literature	T. W. Fisher & Thomas S. Bellows & L. E. Caltagirone & D. L. Dahlsten & Carl B. Huffaker & G. Gordh "Handbook of Biological Control: Principles and Applications of Biological Control" (Academic Press) Male, J. Brostoff, D. B. Roth, I. Roitt "Immunology" (Mosby Inc.) I. M. Hamblin and G. Jori "Medical and Environmental applications (RSC Publishing) E. Kutter, A. Sulakvelidze "Bacteriophages biology and application" (CRC Press)
	Supplementary literature	Before the classes, the students will be provided with appropriate, relevant learning materials (experimental and review publications, book chapters, reports
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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