

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	<p>Biological control:</p> <ul style="list-style-type: none"> - the idea of biological control / biological protection history, aim, examples - the concept of biological protection with the focus on marine (natural and artificial) environments <p>Bacteriophages:</p> <ul style="list-style-type: none"> - 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 <p>Vaccines:</p> <ul style="list-style-type: none"> - 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 <p>Photobiology:</p> <ul style="list-style-type: none"> - 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	<table border="1"> <thead> <tr> <th>Subject passing criteria</th> <th>Passing threshold</th> <th>Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>written test</td> <td>51.0%</td> <td>100.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	written test	51.0%	100.0%
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Recommended reading	Basic literature	<p>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)</p> <p>Male, J. Brostoff, D. B. Roth, I. Roitt "Immunology" (Mosby Inc.)</p> <p>I. M. Hamblin and G. Jori "Medical and Environmental applications (RSC Publishing)</p> <p>E. Kutter, A. Sulakvelidze "Bacteriophages biology and application" (CRC Press)</p>
	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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