

Subject card

Subject name and code	Biotechnology of Reproduction and Rearing of Cultivated Invertebrates - lecture, PG_00201270						
Field of study	Aquaculture – Business And Technology						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2028/2029		
Education level	Bachelor’s studies		Subject group		Obligatory subject group in the field of study		
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	practical		Assessment form		exam		
Conducting unit	Faculty of Oceanography and Geography -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Katarzyna Smolarz, prof. UG				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	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		2.0		18.0	50
Subject objectives	The aim of the course is to familiarize the student with the latest methods used in biotechnology of reproduction and breeding of invertebrate organisms in aquaculture.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[AKWAL3-K03] is ready to follow the ethical principles in biological research and adhere to the principles of intellectual honesty		Students are aware of the role of ethics in biological research and the meaning of intellectual honesty (W1-W6)		[SK1] oral statement/conversation/discussion		
	[AKWAL3-U12] can interact and work in a group, and assume different roles		the student is able to cooperate and work in a group, taking on various roles		[SU1] oral statement/conversation/discussion		
	[AKWAL3_W04] has an advanced understanding of the principles of optimization of breeding methods for aquatic invertebrates, and has acquired theoretical and practical knowledge of the diagnostic methods used		Students know the principles of optimization of methods for breeding aquatic invertebrates and they have acquired theoretical and practical knowledge related to the diagnostic methods.		[SW4] test/exam - oral or written		

Subject contents	W.1. The variability in development of aquatic invertebrates used in cultures. W.2. Acquisition of larval forms from the environment or culturing them; preservation and storage of the cultures. W.3. Biotechnological techniques used in aquaculture in order to increase the reproductive success and growth rate: genomic manipulations (polyploid, hybridization), sex determination and controlling (influence of hormones on gonadogenesis, reproductive and physiological processes), transgenesis. W.4. Application of biotechnological techniques in breeding the nucleus cultures for the removal of pathogens or to increase the resistance to pathogens (e.g. use of specific and non-specific immunostimulants, probiotics), or to strengthen the immune system of larval stages; the use of molecular techniques for screening and identification of pathogens. W.5. Production of high assimilation rate foods, which allow to achieve higher growth rates and a wider range of tolerance to abiotic factors (e.g. high-protein food and food that is rich in unsaturated fatty acids and vitamins). W.6. Biotechnics in invertebrate aquacultures in the context of ethics, importance for the environment and human health.		
Prerequisites and co-requisites	Systematics and basic biology of cultivated organisms, Basic physiology of cultivated invertebrates, Basic biochemistry and genetics of cultivated organisms, Diseases of cultivated invertebrates Systematics of cultivated invertebrates and basics of their biology, ecology, biochemistry, physiology and genetics		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final test	51.0%	100.0%
Recommended reading	Basic literature	Grabda E., 1986. Zoologia. Bezkręgowce. PWN	
		Jura Cz., 1997. Bezkręgowce. PWN	
		Żmudziński L., 1990. Świat zwierzęcy Bałtyku. Atlas makrofauny. Wydawnictwo Szkolne i Pedagogiczne, Warszawa	
	Supplementary literature	Hassan M.M., Qina J.G., Li X., 2015. Sperm cryopreservation in oysters: A review of its current status and potentials for .future application in aquaculture. Aquaculture 438, 24-42.	
		Robertson L., Lawrence A.L., Castille F.L., 2008. Effect of feeding frequency and feeding time on growth of <i>Penaeus vannamei</i> (Boone). Aquaculture Research 24, 1-6.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	none		
Work placement	Not applicable		

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