University of Gdańsk

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_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
[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-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

<table>
<tr><td>Subject contents</td><td>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.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>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</td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Final test</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>Grabda E., 1986. Zoologia. Bezkręgowce. PWN

Jura Cz., 1997. Bezkręgowce. PWN

Żmudziński L., 1990. Świat zwierzęcy Bałtyku. Atlas makrofauny. Wydawnictwo Szkolne i Pedagogiczne, Warszawa</td></tr><tr><td>Supplementary literature</td><td>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 Penaeus vannamei (Boone). Aquaculture Research 24, 1-6.</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>none</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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