University of Gdańsk

Subject card

Subject name and code	Biotechnology of Reproduction and Rearing of Cultivated Invertebrates - laboratory classes, PG_00201269		
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 Subject group related to practical vocational preparation
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	3.0
Learning profile	practical	Assessment form	credit
Conducting unit			
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	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	2.0	43.0	75

Subject objectives

The aim of the course is to familiarize the students 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-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 (program content: 1-2)	[SU8] observation of student's independent or team work
[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 [SW1] 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. Students know and value the practical application of knowledge	[SK1] oral statement/conversation/ discussion
[AKWAL3-U03] can competently obtain selected aquatic invertebrates for ongoing breeding and perform simple practical tasks related to their breeding under the guidance of the scientific supervisor	Students can independently acquire selected aquatic invertebrates for the ongoing breeding and perform simple practical tasks related to the breeding under the supervision of an academic advisor	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written

Subject contents	1. Developmental stages of cultivated invertebrates - identification of larval and juvenile stages. 2. Cytogenetic techniques in genomic manipulations: methods of polyploid creation in selected marine mussels. 3. Determination of the effect of food on the growth rate and indicators of bioenergetic efficiency in selected species of crustaceans.
Prerequisites and co-requisites	Systematics of cultivated invertebrates and basics of their biology, ecology, biochemistry, physiology and genetics. Systematics and basic biology of cultivated organisms, Basic physiology of cultivated invertebrates, Basic biochemistry and genetics of cultivated organisms, Diseases of cultivated invertebrates

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
work and activity during classe	51.0%	15.0%
final assessment work (report)	51.0%	15.0%
knowledge of the material covered during laboratories (final written test)	51.0%	70.0%

Recommended reading	Basic literature	Allan G., Burnell G., 2013. Advances in Aquaculture Hatchery Technology. Woodhead Publishing. Conn, D. B., 2000. Atlas of invertebrate reproduction and development, J. Wiley & Sons, New York. Dunham R. A., 2011, Aquaculture and fisheries biotechnology: genetic approaches, Second edition, CABI Publishing, Cambridge. Fingerman M., Nagabhushanam R., 2000. Recent Advances in Marine Biotechnology, Vol. 4: Aquaculture: Part A: Seaweeds and Invertebrates. CRC Press. Grabda E., 1986. Zoologia. Bezkręgowce. PWN Jura Cz., 1997. Bezkręgowce. PWN Lucas J.S., Southgate P. C., 2012. Aquaculture: farming aquatic animals and plants. Second edition, Blackwell Publishing Ltd., Oxford . Phillips B.F., 2013. Lobsters: Biology, Management, Aquaculture and Fisheries. 2nd Edition, John Wiley & Sons, Ltd. Sumich, J. L., J. F. Morrissey, 2004. Introduction to the biology of marine life, Jones and Bartlett Publisher, Boston Young C. M., 2002. Atlas of marine invertebrate larvae, Academic Press, USA Literature based keys to determining the development stages of aquatic organisms from various sea and ocean regions - specialized 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 Penaeus vannamei (Boone). Aquaculture Research 24, 1-6. Inne publikacje naukowe z czasopism: Aquaculture, Aquaculture Research, Aquaculture International, Marine Biotechnology, Journal of Shellfish Research, Science of The Total Environment.
	eResources addresses	
Example issues/ example questions/ tasks being completed	none	
Work placement	Not applicable	