University of Gdańsk

Subject card

Subject name and code	Reproductive biotechnology - laboratory classes, PG_00192672						
Field of study	Marine Biotechnology						
Date of commencement of studies	October 2027		Academic year of realisation of subject	2027/2028			
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	2.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	Laboratory of Aquaculture -> Department of Marine Biology and Biotechnology -> Faculty of Oceanography and Geography -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Konrad Ocalewicz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	20.0	0.0	0.0	20
	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	20		2.0	28.0	50	
Subject objectives	The overall aim of the course is to provide students with practical knowledge of advances in marine vertebrate reproductive technology freshwater along with practical aspects and biotechniques used in reproductive biotechnology, mainly in fish. The student will acquire skills in the practical use of biotechnological tools for assisted reproduction of fish in aquaculture their use and connections with other fields and disciplines of science, e.g. developmental biology, molecular biology, genetic engineering.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[MBMU2-KU01] Can plan and conduct research in the laboratory and at sea, and to document procedures and results. Independently or under the supervision of an authorized staff member, carries out work using specialized equipment. Complies with occupational health and safety regulations.	Is able to plan and conduct research in the laboratory in the field of reproductive biotechnology and document activities and results; can pod use laboratory equipment under the supervision of a supervisor; applies the rules occupational health and safety	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work
[MBMU2-KW03] Has an in-depth knowledge and understanding of complex biological phenomena at the molecular level, understands their significance for an organism, marine environment and marine biotechnology	Knows and understands complex biological phenomena related to fish reproduction processes at the molecular level, understands their importance for organism, marine environment and marine biotechnology	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[MBMU2-KK01] Is ready to critically evaluate his knowledge and continuously improve, update and upgrade his skills in the field of marine biotechnology	Is willing to assess and understand threats and dilemmas, including: ethical dilemmas related to conducting scientific research and introducing advanced technologies for the reproduction of aquatic vertebrates, including mainly fish; understands and appreciates the importance of intellectual property; progresses ethically	[SK1] oral statement/conversation/ discussion [SK8] observation of student's independent or team work

Subject contents

The laboratories will cover practical aspects of modern reproductive biotechnology techniques in marine organisms and will be divided into 3 main experimental blocks: B1: Assessment of the quality of eggs and sperm and the stage of oocyte development; gamete storage, sperm cryopreservation. B2: in vitro fertilization and assessment of the developmental stage of the embryo after fertilization. B3: Production of triploid fish embryos using temperature/pressure shock for polyploidization. Ploidy level assessment: karyotyping of diploid and triploid fish embryos.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
report 2	51.0%	15.0%
test	51.0%	55.0%
report 1	51.0%	15.0%
report 3	51.0%	15.0%

Recommended reading

Basic literature	Zwierzchowski L (ed). 1997. Animal biotechnology. Ed. Scientific PWN.. Demska-Zakęś K. 2008. Innovative techniques for biological assessment and protection of valuable species of farmed fish and crayfish. IRŚ Publishing House. A.2. studied independently by the student Exercise instructions prepared by the instructor. Marek Maleszewski. Exercises in the biology of animal development. Hwa Jin Y et al. 2021. Surrogate broodstock to enhance biotechnology research and applications in aquaculture. Aquaculture Advances 49(2021)107756 Artykuły naukowe opublikowane w czasopismach z obszaru inżynierii genomowej I genetycznej.
Supplementary literature	Artykuły naukowe opublikowane w czasopismach z obszaru inżynierii genomowej I genetycznej.
eResources addresses	

Example issues/ example questions/ tasks being completed

Collection of gametes from spawning salmonids, analysis of sperm motility and in vitro fertilization.

Work placement

Not applicable

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