University of Gdańsk

Subject card

Subject name and code	Fish genetics - laboratory exercises, PG_00075917		
Field of study	Aquaculture – Business And Technology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	undergraduate studies	Subject group	
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish not applicable
Semester of study	4	ECTS credits	1.0
Learning profile	practical	Assessment form	
Conducting unit			
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marcin Kuciński	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	15.0	0.0	0.0	15

E-learning hours included: 0.0

Additional information:
Laboratory exercises

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	0.0	10.0	25

Subject objectives

1. Introducing students to the potential use of knowledge about fish genetics to increase production through proper breeding and selection practices.
2. Familiarizing students with modern technologies for obtaining fish with specific production traits.
3. Introducing students to the basic elements of genetic diagnostics.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[AKWAL3_W06] knows and discusses techniques, research methods and tools used in aquaculture	Students know and discuss techniques, research methods, and tools used in fish genetics	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[AKWAL3-W12] knows and understands the role of aquaculture in the modern economy and its impact on the natural environment	Students understand the role of fish genetics in aquaculture and its impact on the natural environment	[SW4] test/exam - oral or written
[AKWAL3_W03] knows and understands the conceptual categories and terminology related to the biological basis of aquatic organisms breeding, as well as concepts directly relevant to the practical applications of this knowledge	Students understand the conceptual categories and terminology related to fish genetics and the biological foundations of breeding aquatic organisms, as well as concepts directly related to the practical applications of this knowledge	[SW4] test/exam - oral or written
[AKWAL3-U06] can apply basic techniques and technological processes related to the use of elements of the environment for practical purposes	Students are able to apply basic research and analytical tools related to genetic studies of fish for practical purposes	[SU6] demonstration of practical skills [SU8] observation of student's independent or team work
[AKWAL3-K05] student is ready to appreciate the practical application of acquired knowledge	Students are ready to appreciate the practical application of acquired knowledge during work in the aquaculture industry.	[SK2] presentation/project/paper/ report

Subject contents

1. Genetic identification of fish sex and hybrids - application of the PCR test,
2. Estimation of selection and inbreeding results,
3. Estimation of triploidization effectiveness,
4. Selecting breeding pairs based on genetic profiles.

Prerequisites and co-requisites

none

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Report	51.0%	50.0%
Test	51.0%	50.0%

Recommended reading

Basic literature	Fopp-Bayat D., Łuczyński M. Jankun M. 2011. Gospodarowanie stadami rozrodczymi naturalnych i hodowlanych populacji ryb podstawy genetyki ilościowej. Wyd. Argi, t.1i 2. John Liu. 2007. Aquaculture Genome Technologies. Wyd. Blackwell Publishing. Gjedrem T. 2010. Selection and breeding programmes in aquaculture. 2010.. Springer; Goryczko K. 2008. Pstrągi. Chów i hodowla. Wyd. Instytut Rybactwa Śródlądowego Olsztyn. Brown TA. 2009. Genomy. Wyd. PWN Dunham R.A. 2004. Aquaculture and fisheries biotechnology. Genetic approaches. CABI Publishing;
Supplementary literature	Articles on fish genetics, genomics, and transcriptomics published in industry journals, e.g., Aquaculture, Aquaculture International, Aquaculture Research.
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	1. What is DNA isolation using the Chelex-100 method? 2. What is the PCR technique and what is its application in molecular diagnostics? 3. What is agarose gel electrophoresis? 4. What are genotyping and sequencing? 5. What are microsatellite DNA markers and what purposes are they used for? 6. What traits have been effectively improved in Atlantic salmon by introducing a construct containing the Pacific salmon growth hormone gene and a promoter gene from the ocean pout into its genome? 7. Inter-species hybrids are used on a relatively large scale in aquaculture. List at least three examples of such hybrids and describe what traits of these hybrids are "better" compared to the parental species.
Work placement	Not applicable

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