University of Gdańsk

Subject card

Subject name and code	Hydraulic and General Engineering in Aquaculture - laboratory classes, PG_00201274		
Field of study	Aquaculture – Business And Technology		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
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	1	Language of instruction	Polish
Semester of study	2	ECTS credits	2.0
Learning profile	practical	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	dr inż. Marcin Kuciński	
	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	3.0	17.0	50

Subject objectives

1. Familiarizing students with the organization of a fish farming center, with particular emphasis on hatchery facilities and water-sanitary elements.
2. Introducing students to the basics of designing breeding ponds and hydraulic structures used in aquaculture.
3. Familiarizing students with the principles of organizing work during the construction of a fish production center.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[AKWAL3-K04] is ready to identify and recognize dilemmas connected with the profession and understands the need to improve professional competence	Studenta are ready to identify and recognize dilemmas associated with future work as a manager of an aquaculture production center and understands the need for enhancing professional competencies.	[SK1] oral statement/conversation/ discussion [SK8] observation of student's independent or team work
[AKWAL3-U06] can apply basic techniques and technological processes related to the use of elements of the environment for practical purposes	Studenta are able to apply basic techniques and technological processes related to the utilization of environmental elements for practical purposes, including functional planning of work in aquaculture farming centers.	[SU2] presentation/project/paper/ report
[AKWAL3-U02] can make observations and perform simple physical / biological / chemical measurements that are typical in socio-economic activity based on natural sciences	Students are able to conduct observations and perform simple physical / biological / chemical measurements, which are helpful in designing aquaculture breeding facilities.	[SU2] presentation/project/paper/ report
[AKWAL3-K02] is ready to take responsibility for the work of the team and its safety; knows how to make decisions and how to act in different situations	Studenta are prepared to take responsibility for team work at the fish farming center, prioritize safety, make decisions, and act appropriately in various situations.	[SK1] oral statement/conversation/ discussion [SK5] implementation of a problem task

Subject contents

1. Hydrological fundamentals of aquaculture projects,
2. Designing complete trout farming facilities,
3. Designing complete carp farming facilities,
4. Determining water flow and velocity in time cycles within a farming operation,
5. Site selection and spatial design of aquaculture production centers.

Prerequisites and co-requisites

Basic knowledge in mathematics, physics, chemistry, and hydrology. Proficiency in computer use, office suite software, and any graphic design program.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Completion of a comprehensive project for a trout farming facility.	51.0%	40.0%
Completion of a comprehensive project for a carp farming facility.	51.0%	40.0%
The student demonstrates active participation and engagement in discussions during classes.	51.0%	20.0%

Recommended reading	Basic literature	1. Budownictwo rybackie. Autor: Czesław Król. Wydawca: Państ. Wydaw. Rolnicze i Leśne (1986). ISBN: 83-09-01043-5, 83-09-10043-5; 2. Ryszard Wojda, 2015 - Chów i hodowla karpia. Wyd. IRS, s. 457; 3. K. Goryczko, J. Grudniewska 2015 Chów i hodowla pstrąga tęczowego Wyd. IRS, 2015, s. 173; 4. Ryszard Kolman, 2010 - JESIOTRY. Chów i hodowla. Poradnik hodowcy. II wydanie, Rozszerzone i poprawione, Wyd. IRS, s. 134. 5. Ebeling, J. M., Timmons, M. B., & Ebeling, J. M. (2010). Recirculating aquaculture. Cayuga Aqua Ventures. 6. Burzyńska-Szyszko M. Materiały konstrukcyjne. 2011 Warszawa. ISBN 83-89703-73-4. 7. Ciszewski A., Radomski T., Szumer A., Materiałoznawstwo, OWPW, Warszawa, 1998. 8. Kaczorowski M, Krzynska A., Konstrukcyjne materiały metalowe, ceramiczne i kompozytowe, OWPW, Warszawa, 2008. 9. Guziur J., Białowąs H., Milczarzewicz W. 2002. Rybactwo stawowe. Wyd. HOŻA. Warszawa.
	Supplementary literature	Articles on the construction and management of fish farming facilities in industry journals such as Aquaculture Engineering, Aquaculture International, Komunikaty Rybackie, etc.
	eResources addresses	

Example issues/ example questions/ tasks being completed	1. Basic classification of construction materials; 2. Discussion of mechanical properties of materials; 3. Criteria for selecting construction materials; 4. Characteristics of construction materials used for building aquaculture production facilities; 5. Basics of hydraulics; 6. Hydraulic basics for designing water supply installations for breeding centers; 7. Division and characteristics of water system solutions used in aquaculture production facilities; 8. Construction and characteristics of water devices in water supply and distribution systems in breeding facilities; 9. Division and characteristics of water intakes for aquaculture purposes; 10. Basic division and characteristics of aquaculture breeding facilities; 11. Division and characteristics of pond/basin categories used in trout and carp breeding facilities; 12. General characteristics of hatchery-nursery facilities including hatchery equipment, manipulation rooms, and auxiliary rooms; 13. Description of technical solutions for water heating; 14. Determination of maximum water demand for a hatchery-nursery facility; 15. Basic guidelines for designing hatchery buildings; 16. Nursery methods for fish rearing; 17. Division, construction, and characteristics of damming and protective structures in aquaculture; 18. Characteristics of water intakes and outlets in aquaculture; 19. Construction and characteristics of flow regulation structures used in aquaculture; 20. Characteristics of reinforcement methods for watercourses and artificial water channels in breeding centers; 21. Division and characteristics of sluices, inlet structures, and outlets in pond breeding facilities; 22. Types and construction of fish capture and storage devices in breeding facilities; 23. Types and designs of transportation structures in breeding facilities; 24. Types and construction of fish passages;

	25. Types of earth embankments used in pond breeding facilities; 26. Designing and building earth embankments; 27. Types, construction, and operation principles of water oxygenation structures used in aquaculture; 28. Types, construction, and efficiency of pumps used in aquaculture; 29. Principles for selecting pumps; 30. Types and construction of devices and structures used for post-production water treatment in aquaculture.
Work placement	Not applicable

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