University of Gdańsk

Subject card

Subject name and code	Nutrition and food science - laboratory exercises, PG_00075923		
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	2.0
Learning profile	practical	Assessment form	
Conducting unit	Pracownia Akwakultury -> Katedra Biologii Morza i Biotechnologii -> Faculty of Oceanography and Geography		
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

Additional information:
Solving tasks - work cards,

Student seminar presentations,

Discussion,

Field trips.

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	10.0	15.0	55

Subject objectives

1. Introducing students to inter-species differences in the feeding behavior of various fish species and their nutritional requirements.
2. Familiarizing students with methods of feed production and composition.
3. Explaining the varying nutritional requirements of fish for different stages of development.

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 studies related to fish nutrition in aquaculture.	[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 techniques and technological processes related to fish feed production, utilizing environmental elements for practical purposes.	[SU2] presentation/project/paper/ report
[AKWAL3-K04] is ready to identify and recognize dilemmas connected with the profession and understands the need to improve professional competence	The students are ready to identify and perceive dilemmas associated with future fish farming profession and understands the necessity of enhancing professional competencies.	[SK2] presentation/project/paper/ report [SK8] observation of student's independent or team work

Subject contents

1. Feeding with live feed in early stages of fish development,
2. Feeding of salmonid fish,
3. Feeding of cyprinid fish,
4. Feeding of sturgeon and catfish,
5. Fish diseases caused by improper feeding,
6. Principles of formulating feed mixtures recipes,
7. Innovative components used in fish feed production,
8. Alternative protein and fat sources in fish feed production.

Prerequisites and co-requisites

Basic knowledge about the biology and physiology of fish.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Presentation with written elaboration	51.0%	30.0%
Class participation - engagement in discussions	51.0%	20.0%
Independent work - work cards	51.0%	50.0%

Recommended reading

Basic literature

1. Lovell RT. Nutrition and Feeding Fish. 1989. Wyd. Van Nostrand Reinhold, New York.

2. Goryczko K. 2008. Pstrągi. Chów i hodowla. Wyd. Instytut Rybactwa Śródlądowego Olsztyn.

3. Wojda R. 2009. Karpie, Chów i hodowla. Wyd. Instytut Rybactwa Śródlądowego Olsztyn.

4. Ryszard Kolman, 2010 - JESIOTRY. Chów i hodowla. Poradnik hodowcy. II wydanie, Rozszerzone i poprawione, Wyd. IRS,

5. Halver J. 2003. Fish nutrition. Wyd. Academic Press. New York London,

6. Wylęgarnictwo, podchowy ryb i zarybienia. Ed. Zakęsia, Zdzisława; Demska-Zakęś, Krystyna. Instytut Rybactwa Śródlądowego, Olsztyn 2016 (ISBN 978-83-60111-86-4),

7. Monografia: Żywienie ryb i inne problemy akwakultury. Wylęgarnia 2020.

	Supplementary literature	Articles on fish nutrition and aquaculture published in industry journals such as Aquaculture, Aquaculture International, Aquaculture Research, and Komunikaty Rybackie: 1. Poczyczynski, P., & Wozniak, M. (2013). Pasze sztuczne w żywieniu ryb. I. Pasze sztuczne w żywieniu ryb. I. Wprowadzenie. Komunikaty Rybackie, 3, 2. Poczyczyński, P., & Wozniak, M. (2013). Pasze sztuczne w zywieniu ryb. II. Zapotrzebowanie energetyczne ryb oraz wpływ temperatury na procesy trawienne i dawki pasz. Komunikaty Rybackie, 3, 3. Poczyczynski, P., & Wozniak, M. (2013). Pasze sztuczne w zywieniu ryb. III. Zapotrzebowanie na makronutrienty białko i aminokwasy egzogenne. Komunikaty Rybackie, 3, 4. Poczyczynski, P., & Wozniak, M. (2013). Pasze sztuczne w zywieniu ryb. IV. Pozostałe makronutrienty - lipidy i weglowodany. Komunikaty Rybackie, (6), 5. Golez, N. V. (2002). Processing of feedstuffs and aquafeeds. In Nutrition in Tropical Aquaculture: Essentials of fish nutrition, feeds, and feeding of tropical aquatic species (pp. 125-147). Aquaculture Department, Southeast Asian Fisheries Development Center.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. Feeding strategies of fish, 2. Basics of metabolic transformations dynamics in fish, 3. Factors determining the energy requirements of fish, 4. Energy requirements of fish, 5. Energy balance of fish, 6. Structure of the fish gastrointestinal tract, 7. Length of the fish gastrointestinal tract, 8. Development of the gastrointestinal system throughout the life of fish, 9. Basics of the process of digestion and nutrient absorption in fish, 10. Basics of enzymology of the digestion process in fish, 11. Digestion of proteins, fats, carbohydrates, and nucleic acids in fish, 12. Development of the enzymatic digestive apparatus in fish, 13. Concepts of nutrition and feed science, 14. Levels of intensification of fish production (feeding) in aquaculture, 15. Fish feeding techniques, 16. Methods for determining the frequency of fish feeding, 17. When not to feed fish? 18. Criteria for selecting fish feeds and assessing their quality, 19. Feed conversion ratio (FCR) and fish growth rate, 20. Micro- and macronutrients in fish diets, 21. Importance of protein and its requirements in fish diets, 22. Importance of lipids and their requirements in fish diets, 23. Importance of carbohydrates and their requirements in fish diets, 24. Importance of trace elements and their requirements in fish diets, 25. Importance of vitamins and their requirements in fish diets, 26. Functional additives in fish nutrition, 27. Feed quality and its significance in aquaculture production, 28. Basic classification and characteristics of anti-nutrients observed in feed components for fish, 29. Characteristics of selected components for fish feed production, 30. Basics of formulating feed mixtures, 31. Digestibility of feed components, 32. Amount of pollutants generated depending on the quality of feed components used, 33. Methods of preliminary processing of feed components, 34. Formation and stabilization of industrial feeds - technology of industrial feed production for fish, 35. Methods of stabilizing aquafeeds and controlling their quality during production, 36. Influence of starch addition on feed buoyancy.	
Work placement	Not applicable	

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