załącznik nr 2 do uchwały Rady Szkoły Doktorskiej UPP nr 1/P/2023

SYLLABUS – PULS Doctoral School

Name of the course (as specified in the approved program): **Experimental methods in zootechnics and fisheries part 1.**	
Name of the course in Polish: **Metody doświadczalne w zootechnice i rybactwie część 1.**	
Unit providing the course (Department): **Department of Animal Nutrition**	
Course leader: **Dr hab. prof. PULS Małgorzata Kasprowicz-Potocka**	
Discipline: **Animal science and fisheries**	Semester: **4**

TYPE OF CLASSES:
(course load)

- Lectures	**6**
- Practical classes	**6**
- Self-study	**10**
Total number of hours:	**22**

OBJECTIVE OF THE COURSE:

Presentation of the current status of knowledge about the actual trends and procedures of digestibility testing methods for nonruminants and ruminants.
Getting acquainted with the practical implementation of the procedures of digestibility determination of feeds with different methods.

TEACHING METHODS:

Multimedia presentations
Journal club – selecting data for discussion Analysis of case studies
Laboratory experiments

EDUCATION OUTCOMES*	Reference to education outcomes of the PULS Doctoral School
In the area of knowledge (PhD students know and understand): 1) world scientific literature concerning nutrition, feed applications and digestibility of feed components along with the resulting implications for nutrition in practice and environmental status 2) the latest theories and trends in the area of nutrition research concepts and their scientific interpretation	P8U_W_1 P8U_W_2
In the area of skills (PhD students know how to): 3) apply knowledge in the process of creative formulation of their research problems 4) innovatively solve research tasks using independently gained knowledge concerning state-of-the-art methods and research tools	P8U_U_1 P8U_U_2
In the area of social competencies (PhD students are capable to): 5) independently planning of research 6) promote appropriate models of teamwork 7) maintain and promote the importance and role of the intellectual community in social life	P8U_K_1 P8U_K_4 P8U_K_5

Methods of evaluation of outcomes achievement:

Theoretical knowledge: applying knowledge to calculate tasks and interpret results: learning outcomes 1, 2
Assessing the method and correctness of research based on the methodology (practical knowledge): learning outcomes 2-7
Protocol of mathematical and/or chemical analyses (practical knowledge): learning outcomes 2- 7

* efekty uczenia się stanowią Załącznik nr 1 do Regulaminu Szkoły Doktorskiej Uniwersytetu Przyrodniczego w Poznaniu, który stanowi załącznik do uchwały nr 44/2021 Senatu UPP

TEACHING CONTENT:

• A review of current nutritional research topics based on international literature (cows, poultry, pigs).
• Digestibility testing procedures and methods – non-ruminants (indicator methods, differential methods, cannulated animals, principles of chyme and fecal collection, freeze-drying, intestinal and total digestibility coefficients, apparent and true digestibility) and ruminants (in vitro, in sacco, cannulated animals).
• Ruminants – physical methods of separating feces from urine.
• Analysis of biological material and calculation of digestibility coefficients using the indicator method and butch culture.
• Participation in biological material collection.

The course completion criteria and methods:	Percent of a final grade:
Format Lecture:	
• Participation in discussions (lectures)	40%
• Written transcript of practical exercises – graded assignments	30%
• Practical skills test	30%
Criteria	
• Correctness of assignment solutions	
• Attendance at least 80%	
• Active participation in classes (participation in discussions, answers to lecturer's questions)	
☐ **pass (Z)** ☐ **course credit with a grade** ☒ **examination (note)**	

RECOMMENDED LITERATURE:

1. Adeola, O. (2000). Digestion and balance techniques in pigs. In *Swine nutrition* (pp. 923-936). CRC press.
2. Bedford, Michael & Masey O'Neill, Helen & Pesti, Gene & Patience, John & Lindsay, David & Alhotan, Rashed & Costa, MJ & Billard, L & Choct, Mingan. (2016). Nutrition Experiments in Pigs and Poultry: A Practical Guide. 10.1079/9781780647005.0000.
3. Cherian G. (2020). A Guide to the Principles of Animal Nutrition. XX. Measurement of Feed and Nutrient Utilization in Food- Producing Animals.
4. Deitmers, J. H., Hartinger, T., Gresner, N., & Südekum, K. H. (2024). Comparison of ruminal fermentation characteristics of two common forages using a coupled in vivo-in situ approach and the in vitro rumen simulation technique RUSITEC. Animal Feed Science and Technology, 115900.
5. Kleyn, Rick. (2022). Chicken Nutrition: A guide for nutritionists and poultry professionals.
6. López, S. (2005) In Vitro and In Situ Techniques for Estimating Digestibility CSIC Digital https://digital.csic.es › bitstream.
7. Zewdie, A. K. (2019). The different methods of measuring feed digestibility: A review. *EC Nutr*, *14*(1), 68-74.
8. Zhang, F., Adeola, O. (2017). Techniques for evaluating digestibility of energy, amino acids, phosphorus, and calcium in feed ingredients for pigs. *Animal Nutrition*, *3*(4), 344-352.