Course title:	In vitro cell culture – practical applications in scientific research
Course title in Polish:	Hodowle komórek in vitro - praktyczne zastosowanie w badaniach naukowych
Course for discipline:	Veterinary medicine; biological sciences; animal science and fisheries

Semester:	5	**Status of course:**	faculty	**Language:**	english
Academic year:	2027/28	**Catalog number:**	171/2025/26		

Coordinator of course:	Dr hab. Joanna Cymerys-Bulenda, prof. SGGW
Lecturer od course:	Dr hab. Joanna Cymerys-Bulenda, prof. SGGW; dr Anna Słońska-Zielonka
Executing unit:	Department of Preclinical Sciences, Institute of Veterinary Medicine, Warsaw University of Life Sciences
Ordering unit:	Doctoral School SGGW
Assumptions, goals and description of the course:	PhD students will become familiar with key aspects of working with cell cultures, including cell isolation and the establishment of primary cultures, maintenance of cell cultures, assessment of cell condition in culture, and performance of cell-based assays under in vitro conditions. Classes will be conducted in a mixed lecture-practical format. The lecture component will cover types of cell cultures, differences between primary cell cultures and established cell lines, methods for isolating and culturing various primary cell types (including neurons, astrocytes, microglia, and fibroblasts), common challenges in cell culture, and applications of in vitro cell models in scientific research, with particular emphasis on virological studies. The practical component will focus on hands-on laboratory training, including establishing primary cultures of murine neural cells and fibroblasts, basic techniques for maintaining cell cultures (monitoring cell growth, density, and viability; passaging; cell counting), and preparing cell cultures for research applications.
Didactic form, number of hours:	Lectures, exercises, 15 hours
Teaching methods:	Theoretical introduction to laboratory course topics, laboratory classes, conducting an experiment.
Limit of people in the group:	8

Learning outcomes

KNOWLEDGE - the graduate knows and understands:	**SKILLS - the graduate is able to:**	**COMPETENCES - the graduate is ready to:**
To the extent enabling to revise the existing pradigms in the field/discipline - the world achievments, gathering theoretical background as well as general and selected detailed issues	Carry out critical assessment of the scientific research findings and expert activities and their contribution to the knowledge development in the field/discipline	Critically evaluate the achievments in the field/discipline represented
Major general development trends in the field/discipline		Recognise knowledge in solving cognitive and practical problems characteristic for the area of research (field/discipline) and in an interdisciplinary aspect
		Support the ethos of scientific circles and conduct independent research

The method of verification of learning outcomes:	Assessment of activity during classes.
Form of documentation of achieved learning outcomes:	Entry into the eHMS system and documentation included in the "Subject Folder" (individual student assessment cards, attendance lists).
Elements and weights of the final grade:	Activity during classes 100%.
Place of the course:	Laboratories of the Department of Preclinical Sciences, Institute of Veterinary Medicine, Warsaw University of Life Sciences (bld 23, labs 2034-2036).

Basic and supplementary literature

1. Mouse cell culture. Methods in Molecular Biology. Andrew Ward, David Tosh. Humana Press 2010.
2. Cell Culture Technology. Cornelia Kasper, Verena Charwat, Antonina Lavrentieva, ISBN : 978-3-319-74853-5, 2018 https://link.springer.com/book/10.1007/978-3-319-74854-2
3. Materials provided by the teacher, e.g., isolation of primary murine neurons protocol.

Comments:	no

Estimated number of hours of work of the doctoral student necessary to achieve the assumed learning outcomes:	

Leraning outcomes reference to the second degree characteristics of the National Qualification Framework (level 8) covering doctoral competences:

Symbol:	**Learning outcomes:**	**8 level NQF**
SD1_KW01	To the extent enabling to revise the existing pradigms in the field/discipline - the world achievments, gathering theoretical background as well as general and selected detailed issues	P8S_WG
SD1_KW02	Major general development trends in the field/discipline	P8S_WG
SD1_KU05	Carry out critical assessment of the scientific research findings and expert activities and their contribution to the knowledge development in the field/discipline	P8S_UW
SD1_KK01	Critically evaluate the achievments in the field/discipline represented	P8S_KK
SD1_KK03	Recognise knowledge in solving cognitive and practical problems characteristic for the area of research (field/discipline) and in an interdisciplinary aspect	P8S_KK
SD1_KK08	Support the ethos of scientific circles and conduct independent research	P8S_KR