

Course title:	Proteomics in practice: protein identification using mass spectrometry
Course title in Polish:	Proteomika w praktyce - identyfikacja białek z wykorzystaniem spektrometrii mas
Course for discipline:	biological sciences, veterinary science, agriculture and horticulture, food and nutrition technology, animal science and fisheries, forestry science

Semester:	4	Status of course:	faculty	Language:	english
Academic year:	2026/2027	Catalog number:	70/2025/26		

Coordinator of course:	dr hab. inż. Sławomir Orzechowski
Lecturer od course:	dr hab. inż. Sławomir Orzechowski
Executing unit:	Department of Biochemistry and Microbiology, Institute of Biology
Ordering unit:	Doctoral School SGGW
Assumptions, goals and description of the course:	The aim of this course is to provide PhD students with a practical introduction to protein identification using a MALDI TOF-TOF mass spectrometer. PhD students will gain practical experience in SDS-PAGE protein separation, proteolytic enzyme digestion of excised protein from the gel, and, after peptide extraction, subsequent analysis of the resulting peptide masses using a MALDI TOF-TOF mass spectrometer. Then, using publicly available databases, protein identification, that is, Peptide Mass Fingerprinting (PMF), will be performed. The necessary theory will be taught during practical exercises and before the course begins. Common errors will be addressed during the practical sessions.
Didactic form, number of hours:	15 hours: lecture - 2 hours, laboratory classes - 13 hours
Teaching methods:	Multimedia presentation and practical laboratory exercises based on instructions
Limit of people in the group:	4

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 paradigms in the field/discipline - the world achievements, 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 achievements 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:	evaluation of project implementation	
Form of documentation of achieved learning outcomes:	report on the experiments performed	
Elements and weights of the final grade:	report assessment - 100%	
Place of the course:		

Basic and supplementary literature

Instructions prepared for classes, MALDI MS A Practical Guide to Instrumentation, Methods and Applications Edited by Franz Hillenkamp and Jasna Peter-Katalinic, 2007 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim, ISBN 978-3-527-31440-9 Andreadi A, Tsvilekidou E, Dermizakis I, Theotokis P, Gargani S, Meditskou S, Manthou ME. Innovations in MALDI-TOF Mass Spectrometry: Bridging modern diagnostics and historical insights. Open Life Sci. 2025 Jul 18;20(1):20251136. doi: 10.1515/biol-2025-1136.
Comments:

Estimated number of hours of work of the doctoral student necessary to achieve the assumed learning outcomes:	20
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Learning 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 paradigms in the field/discipline - the world achievements, 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 achievements 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