

Subject card

Subject name and code	Graduate laboratory course, PG_00117688						
Field of study	Chemistry						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study Optional subject group Subject group related to scientific research in the field of study		
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		12.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Joanna Makowska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	180.0	0.0	0.0	180
	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	180		30.0		90.0	300
Subject objectives	Substantive and / or practical preparation for realization of experimental part in the field of master thesis						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[CHEMMU2_W10] Uses knowledge of the principles of operation of the basic scientific and research apparatus used in chemistry.	Student: names and describes methods of analysis and/or methods of computer theoretical calculations used during realization of master project distinguishes and characterizes individual experimental/ IT techniques used during realization of research project identifies scientific and research apparatuses used during realization of research project and explains the principles of their operations.	[SW5] implementation of a problem task
	[CHEMMU2_W12] Knows the principles of occupational health and safety to the extent that allows independent work on a research and/or measurement position.	- Student understands the need to exercise due caution when using laboratory equipment and working with chemical reagents; - Student knows the applicable regulations and guidelines regarding occupational health and safety in his field. He is aware of how to prevent accidents and knows the appropriate equipment for his workstation	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
	[CHEMMU2_W02] Has extended and in-depth knowledge in the field of basic chemistry.	- Student is able to discuss specialized topics both in Polish and English, correctly arguing his or her conclusions in the field of chemistry at an advanced level - Student knows how to correctly interpret and analyze related information related to basic chemical laws and issues.	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
	[CHEMMU2_W05] Has extended knowledge in the field of the specialisation studied.	- Student is able to discuss specialized topics both in Polish and English, correctly arguing his or her conclusions in the field of chemistry at an advanced level in the research topic in which he or she is involved. - Student knows how to correctly interpret and analyze related information related to basic chemical laws and issues.	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report [SW3] text preparation/written work
	[CHEMMU2_U02] Critically assesses the results of conducted, performed observations and theoretical calculations and discusses errors.	- Student is critical in expressing opinions on the results obtained during research and is open to the opinions of co-discussants. - The student critically selects source texts to conduct a reliable analysis of his or her own data.	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report
	[CHEMMU2_W03] Demonstrates extended knowledge in the field of modern measuring techniques used in chemical analysis.	Student: recognizes and characterizes methods, techniques and research tools used in chemistry; chooses the correct research methods to complete the master research thesis characterizes development directions and knows the latest discoveries in the field of research carried out as part of the master thesis knows and applies the principles of health and safety during realization of experimental work on a test or measuring stand in laboratory or in the field (outside)	[SW5] implementation of a problem task

	Course outcome	Subject outcome	Method of verification
	[CHEMMU2_K05] Understands the need for independent search of information in scientific literature and popular science magazines.	Student: verifies the level of her/his knowledge and skills; understands the need for continuous vocational training and personal development demonstrates creativity in independent and team work; is characterized by perseverance in taking on personal and professional challenges can work in a group, taking in it various roles is responsible for the safety of own and other work; knows how to deal with emergencies, is careful working with chemicals, is careful working with measuring instruments; understands the need to comply with the principles of professional ethics	[SK2] presentation/project/paper/report [SK3] text preparation/written work [SK5] implementation of a problem task
	[CHEMMU2_U10] Reads with understanding scientific and popular science chemical texts in English.	Student: has the ability to conduct experiments related to the master thesis; uses simple and advanced methods, techniques and tools to achieve goals intended in the master thesis is fluent in finding information in specialized literature (Polish and English) demonstrates the ability to write a master's thesis in Polish and a short scientific report in a foreign language based on her/his own research discusses about issues related to the master thesis in understandable language; is able to define her/his interests and develop them within the chosen specialization and/or within the topic of the master thesis; carries out the process of self-education and planning future career	[SU2] presentation/project/paper/report [SU5] implementation of a problem task
Subject contents	The program content is varied and depends on the scope of the topic of the master thesis		
Prerequisites and co-requisites	First cycle studies in chemistry, environmental protection, chemical engineering and related fields. Knowledge of basic issues in the field of chemistry and / or related scientific fields.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Implementation of a practical research project in practice; results report	100.0%	100.0%
Recommended reading	Basic literature	A. Literature required to pass the course A.1. Literature used during classes: Books and scientific articles related to the topic of the master thesis A.2. Literature for individual studies: Books and scientific articles related to the topic of the master thesis	
	Supplementary literature	B. Extracurricular readings Books and scientific articles related to the topic of the master thesis	

	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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