

**Subject card**

<b>Subject name and code</b>	Laboratory course, PG_00144204						
<b>Field of study</b>	Chemical Business						
<b>Date of commencement of studies</b>	February 2025	<b>Academic year of realisation of subject</b>				2025/2026	
<b>Education level</b>	postgraduate studies	<b>Subject group</b>				Obligatory subject group in the field of study Optional subject group	
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>				at the university	
<b>Year of study</b>	2	<b>Language of instruction</b>				Polish	
<b>Semester of study</b>	3	<b>ECTS credits</b>				10.0	
<b>Learning profile</b>	academic	<b>Assessment form</b>					
<b>Conducting unit</b>	Faculty of Chemistry						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr hab. Joanna Makowska				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	0.0	0.0	190.0	0.0	0.0	190
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	190		32.0		28.0	250
<b>Subject objectives</b>	Planning and performance of experimental research project by each student working under the control / guidance of supervisor. Presentation of obtained research results in the form of written master thesis						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BCHMU2_U05] Is able to choose and apply, based on the literature of chemical sciences in Polish and English, appropriate methods and tools for solving problems in chemistry and related sciences.	Based on Polish and English literature, the student is able to select and check the methodology for completing his master's thesis, confirming his choice. At work, he knows how to interpret and analyze information related to chemical laws. - subsequent publication of scientific texts, the student learns to analyze and synthesize information, isolating key concepts and understanding the issues	[SU2] presentation/project/paper/report [SU3] text preparation/written work [SU5] implementation of a problem task
	[BCHMU2_U07] Is able to use English in chemistry in accordance with the requirements specified for level B2+ of the Common European Framework of Reference for Languages and specialised terminology.	Student: • performs planned experiments, makes observations  • analyzes the obtained results and compares them with the available literature data  • draws conclusions from the conducted research and proves their correctness based on available literature data  • presents the same content in a different language convention  • systematically collects and prepares documentation of his research work	[SU2] presentation/project/paper/report [SU5] implementation of a problem task
	[BCHMU2_U01] Is able to, on the basis of her/his knowledge, propose a solution to problems in chemistry, taking into account the economic aspect by using advanced measurement techniques.	- Student is able to use research equipment to carry out a project and then correctly interpret the obtained results - Student is able to use basic computational and experimental methods in the field of modern measurement techniques used in chemical analysis. Student identifies potential risks related to the project and estimates their impact on financial results. The student takes into account the duration of the project and the time value of money. Is able to determine whether the investment in the project is profitable in the long term.	[SU2] presentation/project/paper/report [SU5] implementation of a problem task
	[BCHMU2_K09] Is willing to conduct research and develop scientific and creative achievements in the field of the specialisation studied.	Student: • works independently  • appropriately defines priorities for the implementation of the task assumed by him/her  • cares about safety while performing chemical experiments on their own  • adheres to the arrangements made regarding the experiments carried out	[SK5] implementation of a problem task [SK6] demonstration of practical skills
	[BCHMU2_K03] Is willing to critically assess the level of her/his knowledge in the light of the achievements of the scientific discipline studied.	- Student verifies the level of one's knowledge and skills; understands the need for continuous professional education and personal development, demonstrates creativity in independent and team work; is persistent in taking up personal and professional challenges and is able to work in a group, taking on various roles	[SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report

	Course outcome	Subject outcome	Method of verification
	[BCHMU2_U02] Is able to define her/his interests, develop them within the chosen direction and in connection with the subject of her/his master's thesis by implementing the process of self-education and planning her/his professional career.	-Student verifies the level of his knowledge and skills; understands the need for continuous professional education and personal development, demonstrates creativity in working independently and in a team. - Student knows his or her strengths. Knows how to conduct professional exploration in the future. Is able to regularly assess his progress and adapt his actions to new challenges.	[SU5] implementation of a problem task
	[BCHMU2_W01] Knows and understands complex physicochemical processes and is able to analyse their course in connection with other fields of science.	Student: <ul style="list-style-type: none"> <li>names and describes the methods of synthesis, analysis and/or computer theoretical calculations used in the project</li> <li>distinguishes and characterizes individual experimental/IT techniques used during the research project</li> <li>identifies the research equipment he came across during the project and explains the principles of its operation</li> </ul>	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
Subject contents	The program content is varied and depends on the scope of the topic of the master thesis		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Przedstawienie uzyskanych wyników badań w postaci pisemnej pracy magisterskiej.	100.0%	100.0%
Recommended reading	Basic literature	A. Literature required to pass the course  A.1. Literature used during classes: Specialist literature in the scope of realized master thesis. The scope of literature is corrected and still adopted to conducted master research topics  A.2. Literature for individual studies: Specialist literature in the scope of realized master thesis. The scope of literature is corrected and still adopted to conducted master research topics	
	Supplementary literature	B. Extracurricular readings  Specialist literature in the scope of realized master thesis. The scope of literature is corrected and still adopted to conducted master research topics	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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