

Subject card

Subject name and code	Instrumental analysis, PG_00116834						
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 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	1		ECTS credits		1.0		
Learning profile	academic		Assessment form				
Conducting unit	Laboratory of Chemistry and Analytics of Cosmetics -> Department of Analytical Chemistry -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Grzegorz Romanowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	15.0	0.0	0.0	0.0	15
	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	15		2.0		8.0	25
Subject objectives	familiarize students with the principles of electroanalytical, spectroscopic and chromatographic methods and stages of the analytical process, developing the ability to conduct basic analyses instrumental and their statistical evaluation, developing the ability to solve problems independently problems when conducting chemical analysis						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[CHEMMU2_U04] Applies acquired knowledge of chemistry and related scientific disciplines.	1. Uses basic formulas to calculate the amount of analyte and other chemical and physical quantities.	[SU1] oral statement/conversation/discussion [SU3] text preparation/written work
	[CHEMMU2_W09] Classifies specialist IT tools used in statistical evaluation of experiment results.	1. Calculates the amount of analyte and other parameters in chemical analysis. 2. Performs calculations and statistical evaluation of results in analytical tasks.	[SW1] oral statement/conversation/discussion [SW3] text preparation/written work
	[CHEMMU2_U02] Critically assesses the results of conducted, performed observations and theoretical calculations and discusses errors.	1. Interprets and critically evaluates the results of calculations. 2. Is able to apply and conduct appropriate discussion of errors.	[SU1] oral statement/conversation/discussion [SU3] text preparation/written work
	[CHEMMU2_W10] Uses knowledge of the principles of operation of the basic scientific and research apparatus used in chemistry.	1. Knows what computational method to apply to the appropriate instrumental technique and research equipment used.	[SW1] oral statement/conversation/discussion [SW3] text preparation/written work
	[CHEMMU2_W07] Selects experimental and theoretical techniques to the extent necessary to understand the description and modelling of medium complexity chemical processes.	1. Explains and explains the principles of selecting a calculation method. 2. Recognizes the limitations of using each calculation method.	[SW1] oral statement/conversation/discussion [SW3] text preparation/written work
	[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	1. Demonstrates an active attitude when faced with an analytical problem. 2. Demonstrates the ability to critically evaluate the calculations performed.	[SK1] oral statement/conversation/discussion [SK3] text preparation/written work
	[CHEMMU2_W03] Demonstrates extended knowledge in the field of modern measuring techniques used in chemical analysis.	1. Selects a calculation method for a specific analytical problem. 2. Knows how to perform calculations in a specific chemical analysis.	[SW1] oral statement/conversation/discussion [SW3] text preparation/written work
[CHEMMU2_W02] Has extended and in-depth knowledge in the field of basic chemistry.	1. Defines the basic laws in electroanalytical, spectroscopic and chromatographic methods. 2. Applies the above-mentioned laws in calculations	[SW1] oral statement/conversation/discussion [SW3] text preparation/written work	
Subject contents	Chemical calculations using absolute and comparative analytical measurement methods in the field of spectroscopic methods, chromatographic methods and electroanalytical methods.		
Prerequisites and co-requisites	knowledge of chemical methods of qualitative and quantitative analysis		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	51.0%	100.0%
Recommended reading	Basic literature	W. Szczepaniak Metody instrumentalne w analizie chemicznej, PWN,Warszawa A. Cygański Metody spektroskopowe w chemii analitycznej,WNT, Warszawa A. Cygański Podstawy metod elektroanalitycznych,WNT, Warszawa	
	Supplementary literature	G.W. Ewing Metody instrumentalne w analizie chemicznej, PWN,Warszawa J. Minczewski, Z. Marczenko Chemia analityczna t. IIIAnaliza instrumentalna, PWN, Warszawa D.A. Skoog, D.M. West, F.J.Holler, S.R. Crouch Podstawy chemii analitycznej, PWN, Warszawa J.Garaj Fizyczne i fizykochemiczne metody analizy, WNT, Warszawa	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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