

Subject card

Subject name and code	Analytical chemistry, PG_00050791						
Field of study	Environmental Protection						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2026/2027		
Education level	Bachelor'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	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		2.0		
Learning profile	academic		Assessment form		exam		
Conducting unit	Laboratory of Environmental Analytics and Radiochemistry -> Department of Environmental Chemistry and Radiochemistry -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Alicja Boryło				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	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		33.0	50
Subject objectives	The aim of the classes is to improve skills and familiarize students with all the issues mentioned in the lecture program, especially the analysis of compounds and mixtures. Chemical analysis can have three purposes: chemical qualitative analysis, chemical qualitative analysis, and chemical structural analysis						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[OŚL3_U11] Uses statistical methods as well as algorithms and IT techniques, including application software packages to describe environmental experiments and analysis of typical data in socio-economic activities based on science and natural sciences.	Is able to use statistical methods for environmental experiments and analysis of environmental activities	[SU3] text preparation/written work [SU4] test/exam - oral or written
	[OŚL3_W13] Defines the basic principles of occupational safety, ergonomics and hygiene.	Knows the basic principles of safety, ergonomics and occupational hygiene	[SW4] test/exam - oral or written [SW3] text preparation/written work
	[OŚL3_W03] Operates mathematical, statistical and IT methods and tools in the description and interpretation of phenomena and processes occurring in the environment.	Knows mathematical and IT methods useful for describing phenomena occurring in the environment	[SW4] test/exam - oral or written [SW3] text preparation/written work
	[OŚL3_U07] Uses basic laboratory techniques, conducts field research and performs qualitative and quantitative analyses and draws conclusions on this basis for practical purposes.	Based on field research and qualitative and quantitative analyses, it formulates conclusions for practical purposes	[SU3] text preparation/written work [SU4] test/exam - oral or written
	[OŚL3_W11] Discusses measurement systems and analysis techniques used in monitoring the state of the natural environment.	Has knowledge of techniques used to monitor the natural environment	[SW4] test/exam - oral or written [SW3] text preparation/written work
	[OŚL3_K04] Demonstrates responsibility for the safety of her/his own and others' work and for the workplace, and correctly follows the rules of conduct in emergencies.	The student is aware of how to correctly apply the rules of conduct in emergency situations	[SK3] text preparation/written work [SK4] test/exam - oral or written
	[OŚL3_U02] Plans, selects appropriate research and measuring equipment and devices, performs physicochemical measurements and experiments; analyses the results and draws conclusions based on them.	Based on the planned and performed experiment, the student analyzes the results and formulates conclusions	[SU3] text preparation/written work [SU4] test/exam - oral or written
Subject contents	Validation of analytical methods Chemical analysis I group of cations II group of cations III group of cations Qualitative analysis of selected anions Manganometry Redoximetry Precipitation and complexometric analysis Weight analysis		

Prerequisites and co-requisites	General and inorganic chemistry		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written exam	51.0%	100.0%
Recommended reading	Basic literature	Jerzy Minczewski, Zygmunt Marczenko, Analytical chemistry, PWN, Warsaw, 2019, volumes 1 and 2 Jan Dobrowolski, Analytical chemistry, PZWL, Warsaw Tadeusz Lipiec, Zdzisław Szmal, Analytical chemistry with elements of instrumental analysis, PZWL, Warsaw Ryszard Kocjan, Analytical chemistry, PZWL, volume 1	
	Supplementary literature	Andrzej Cygański, Chemical methods of quantitative analysis, WNT, Warsaw, 2017 (only for the second part, i.e. quantitative analysis) Douglas A. Skoog, Donald M. West, James F. Holler, Stanley R. Crouch, Fundamentals of analytical chemistry, PWN, Warsaw Lecture notes	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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