

Subject card

Subject name and code	Chemical and radiochemical trace analysis, PG_00054827						
Field of study	Environmental Protection						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2026/2027		
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		2.0		
Learning profile	academic		Assessment form		exam		
Conducting unit	Laboratory of Toxicology and Radiation Protection -> Department of Environmental Chemistry and Radiochemistry -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Grzegorz Olszewski				
	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	familiarizing students with all issues mentioned in the lecture program content, introducing students to the basics of chemical calculations in radiochemistry, radiological protection, electrochemistry and spectroscopy, developing the ability to independently experiment, perform measurements and solve problems while conducting experiments and measurements.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[OŚMU2_W04] Chooses methods, techniques and research tools used in environmental protection.		recognizes basic equipment in radiochemistry, electrochemistry and spectrophotometry and is able to use it appropriately to carry out measurements		[SW1] oral statement/ conversation/discussion		
	[OŚMU2_W09] Applies safety and hygiene principles when working independently on a test or measurement stand in a laboratory or in the field.		Can define negative effects on the human body resulting from careless use of radioactive substances		[SW1] oral statement/ conversation/discussion		
Subject contents	Lecture topics: 1. Basic concepts of trace analysis. Analytical techniques used in the analysis of chemical elements. Nuclear chemistry methods in trace analysis: alpha, beta and gamma spectrometry. Electrochemical and spectral methods in trace analysis: potentiometry, coulometry, UV-VIS spectrophotometry. Analyte concentration methods: mineralization and co-precipitation. Validation and evaluation criteria of analytical results in trace analysis: precision, repeatability, reproducibility, accuracy, limit of quantification and detection, certified reference materials and their use in trace analysis. Calibration of measuring equipment, standard addition method and correlation. Statistical tests used in trace analysis. Speciation and speciation analysis.						

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test	50.0%	100.0%
Recommended reading	Basic literature	B. Skwarzec Radiochemia środowiska i ochrona radiologiczna, Wydawnictwo DJ s.c, Gdańska, 2002 W. Szymański Chemia jądrowa, PWN, Warszawa 1996	
	Supplementary literature	None	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

Document generated electronically. Does not require a seal or signature.