

Subject card

Subject name and code	Basics of chromatographic techniques, PG_00171073						
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		Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		1.0		
Learning profile	academic		Assessment form				
Conducting unit	Department of Environmental Analysis -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Monika Paszkiewicz				
	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		5.0		10.0	30
Subject objectives	To introduce knowledge of of chromatographic techniques and their application in the analytical control of technological processes, including: an introduction to the basics of chromatographic techniques, the construction of the equipment and the parameters of its work, an introduction to the basics of interpreting analytical results and to the principles of selecting operating conditions for the equipment, acquiring skills in designing and implementing processes for separating mixtures and for extraction of chemical compounds, acquiring skills in operating in a chromatographic laboratory.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[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.		- Defines the basic parameters in chromatographic analysis, - Knows the construction and principle of operation of the basic research equipment used for chromatographic separations, - Knows the basic methods of quantitative and qualitative analysis		[SU4] test/exam - oral or written		
	[OŚL3_W11] Discusses measurement systems and analysis techniques used in monitoring the state of the natural environment.		- Knows the basics of separation techniques, - Knows and understands the theoretical basics of the chromatographic process - Knows the basic techniques of organic compound analysis		[SW4] test/exam - oral or written		
Subject contents	Classification of separation methods. Theoretical basis of the chromatographic process. Preparation of samples for analysis, classification of extraction techniques, extraction of solid, liquid, gaseous samples. Gas chromatography: carrier gas, injectors, columns, detectors, selection of measurement parameters. High-performance liquid chromatography: pumps, injectors, detectors, column packing - types of stationary phase, mobile phases. Normal and reversed phase chromatography. Other chromatographic techniques: size exclusion chromatography and ion chromatography.						
Prerequisites and co-requisites	General chemistry, organic chemistry, inorganic chemistry, analytical chemistry						
	Knowledge of basic general chemistry, organic chemistry, inorganic chemistry and analytical chemistry.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		0.0%	10.0%
		51.0%	90.0%
Recommended reading	Basic literature	J. Kałużna-Czaplińska, Z. Witkiewicz. Basics of chromatography and electromigration techniques. PWN, 2021 Stepnowski P., Synak E., Szafranek B., Kaczyński Z. Separation techniques. Wydawnictwo UG 2010 Szczepaniak W. Instrumental methods in chemical analysis, PWN, Warszawa, 1996.	
	Supplementary literature	Z. Witkiewicz, W. Wardencki, I. Malinowska. Liquid chromatography: theory and practice. PWN, 2019 Z. Witkiewicz, W. Wardencki, I. Gas chromatography. PWN, 2018	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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