

**Subject card**

<b>Subject name and code</b>	Basics of chromatographic techniques, PG_00171073						
<b>Field of study</b>	Environmental Protection						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>				2027/2028	
<b>Education level</b>	Bachelor's studies	<b>Subject group</b>				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>	4	<b>ECTS credits</b>				1.0	
<b>Learning profile</b>	academic	<b>Assessment form</b>				credit	
<b>Conducting unit</b>	Department of Environmental Analysis -> Faculty of Chemistry -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr hab. Monika Paszkiewicz				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	15.0	0.0	0.0	0.0	0.0	15
	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>	15		5.0		10.0	30
<b>Subject objectives</b>	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.						
<b>Learning outcomes</b>	<b>Course outcome</b>		<b>Subject outcome</b>			<b>Method of verification</b>	
	[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	
<b>Subject contents</b>	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.						
<b>Prerequisites and co-requisites</b>	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
		51.0%	90.0%
		0.0%	10.0%
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		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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