University of Gdańsk

Subject card

Subject name and code	Separation methods, PG_00081935						
Field of study	Chemistry						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2027/2028			
Education level	Bachelor's studies		Subject group	Obligatory subject group in the field of study Optional subject group 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	4		ECTS credits	2.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	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	30.0	0.0	0.0	0.0	0.0	30
	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	30		5.0		15.0	50
Subject objectives	• to introduce students to the theoretical basis of chromatographic techniques, chromatographic equipment and the basic parameters of its operation • to introduce students to the principles of selecting analytical conditions on the basis of physicochemical properties of analyzed compounds • to introduce students to the basics of calculations necessary for the interpretation of analytical results • acquiring the ability to design and implement processes of separation of mixtures by main separation techniques • acquiring skills regarding the procedure in a chromatographic laboratory						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[CHEML3_W04] Characterises the basic methods of chemical compound analysis.	- Knows the basics of separation techniques, - Knows and understands the theoretical basis of the chromatographic process	[SW4] test/exam - oral or written
[CHEML3_W02] Describes the properties of elements and the most important chemical compounds, enumerates the methods of their preparation and methods of analysis.	- Knows basic techniques for analyzing organic compounds	[SW4] test/exam - oral or written
[CHEML3_K03] Establishes priorities in the right way for the implementation of tasks specified by herself/himself and/or by others.	- Understands the need for further education, - Demonstrates responsibility for the results of teamwork, - Promotes the importance of mathematical sciences in explaining many phenomena and processes	[SK8] observation of student's independent or team work
[CHEML3_W10] Enumerates and describes the basic aspects of the construction, operation and use of measuring apparatus and equipment used in experimental works in the field of chemistry and related sciences.	- Knows the structure and principle of operation of the basic analytical apparatus used for chromatographic separations, - Knows the basic methods of quantitative and qualitative 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, gas samples. Gas chromatography: carrier gas, injectors, columns, detectors, selection of measurement parameters. High-performance liquid chromatography:, pumps, injector, detectors, column packing - types of stationary phases, mobile phases. Chromatography in normal and reversed phase system. Other chromatographic techniques: size exclusion chromatography and ion chromatography. Theoretical basis of electromigration techniques.

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
Written exam	51.0%	100.0%

Recommended reading

Basic literature	Witkiewicz Z. Fundamentals of chromatography, WNT, Warsaw, 2005. Szczepaniak W. Instrumental methods in chemical analysis, PWN, Warsaw, 1996. Stepnowski P., Synak E., Szafranek B., Kaczyński Z. Separation techniques. UG Publishers 2010
Supplementary literature	Kocjan R. Analytical chemistry. Handbook for students. Volume 2. PZWL, Warsaw, 2000. Witkiewicz Z., Hepter J. Gas chromatography, WNT, Warsaw, 2009.
eResources addresses	

Example issues/ example questions/ tasks being completed

Work placement

Not applicable

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