

Subject card

Subject name and code	HPLC of biopolymers, PG_00211852						
Field of study	Forensic Analytics						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2028/2029		
Education level	Bachelor's studies		Subject group		Obligatory subject group in the field of study Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	6		ECTS credits		1.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Piotr Mucha, prof. UG				
	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		8.0	25
Subject objectives	The objective of this course is to provide students with knowledge regarding the application of high-performance liquid chromatography (HPLC) in the analysis of biopolymers						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[AKRL3_K04] The graduate is ready to cooperate with representatives of other fields—law, medicine, biology—within forensic expertise.	The student is able to interpret the results of an HPLC analysis and understands their significance	[SK4] test/exam - oral or written
	[AKRL3_W12] The graduate knows and understands, at an advanced level, the latest trends and achievements in analytical chemistry, toxicology, molecular biology and instrumental methods used in forensic science.	The student is able to describe the design and application of advanced combined methods using HPLC	[SW4] test/exam - oral or written
	[AKRL3_W02] The graduate knows and understands, at an advanced level, the analytical methods used in forensic laboratories, in particular spectroscopic, chromatographic and electroanalytical methods.	The student is able to present the theoretical and practical foundations of the process of analyzing biopolymers using HPLC	[SW4] test/exam - oral or written
	[AKRL3_U10] The graduate is able to interpret data from different analytical techniques to reconstruct events or identify evidence material.	The student is able to plan, optimize, and perform an HPLC analysis for a specific group of chemical compounds	[SU4] test/exam - oral or written
	[AKRL3_U03] The graduate is able to perform analyses using instrumental methods (spectroscopy, chromatography, microbiological tests) and interpret research results.	The student is able to optimize conditions and perform HPLC analysis of biopolymers	[SU4] test/exam - oral or written
Subject contents	Basic concepts of liquid chromatography, reversed-phase chromatography, separation by high-performance reversed-phase liquid chromatography (RP-HPLC), gradient and isocratic elution, detectors in HPLC, HPLC with a mass spectrometer (HPLC-MS), determination of biopolymers by HPLC		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	final test	50.0%	100.0%
Recommended reading	Basic literature	Irena Malinowska, Waldemar Wardencki, Zygfryd Witkiewicz, Chromatografia cieczowa teoria i praktyka, PWN, 2019 Joanna Kałużna-Czaplińska, Zygfryd Witkiewicz, Podstawy chromatografii i technik elektromigracyjnych, PWN, 2023	
	Supplementary literature	Zygfryd Witkiewicz, Podstawy chromatografii, PWN, 1992	
	eResources addresses		
Example issues/ example questions/ tasks being completed	What stationary phases are used in RP HPLC? How does the isocratic method differ from the gradient method in liquid chromatography? What parameters influence the optimal analysis of peptides and proteins using HPLC?		
Work placement	Not applicable		

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