

Subject card

Subject name and code	Practical chromatography in criminology and food control, PG_00211862						
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		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Department of Environmental Analysis -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Łukasz Haliński				
	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	To introduce to method development for determination of organic compounds in complex matrices; To familiarize with principles of extraction and purification methods; To teach how to choos the right analytical technique: gas and liquid chromatography, mass spectrometry, rapid detection methods; To show limitations of different analytical approaches and methods in real-life scenarios; To introduce to major groups of compounds in food safety and forensic science: plant and fungal toxins, alkaloids, narcotics and drugs, pesticides; To teach how to design the analytical process step by step;						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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 propose the most appropriate methods used in forensic analysis and understands the importance of critically interpreting the results obtained.	[SW4] test/exam - oral or written
	[AKRL3_U04] The graduate is able to select appropriate equipment for experiments and prepare reports and expert opinions based on analytical results in compliance with legal and ethical standards.	Students can explain the principles of different modern analytical techniques and their usefulness in certain analytical tasks, and gained the knowledge about the application of analytical techniques in toxin analysis.	[SU4] 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.	Students acquired the skills to evaluate strengths and limitations of different analytical and detection techniques with respect to sample properties and to specific analytical problem.	[SW4] test/exam - oral or written
	[AKRL3_W03] The graduate knows and understands the structure and chemical properties of compounds relevant in forensic examinations.	The student is able to describe how a compound's chemical structure affects its properties, behavior, and the methods available for its chemical analysis.	[SW4] test/exam - oral or written
Subject contents	The role of chromatography the criminology and food safety. Natural and synthetic toxins of major concern in food safety and forensic science. Presentation of the modern analytical techniques advanced and practical aspects of liquid chromatography (LC) and gas chromatography (GC); hyphenated techniques (such has GC-MS and LC-MS) and mass spectrometry (MS), with focus on their practical applications in combination with selected extraction procedure. Rapid detection methods. Practical aspects of the quality assurance and control in the analytical laboratory (calibration vs validation process). Extraction techniques used in the criminology and food safety and their limitations. Designing of the whole analytical process. Limitations of analytical approaches in real-life scenarios: how to overcome them?		
Prerequisites and co-requisites	It is highly recommended to accomplish the basic course on chromatography before taking this course.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written exam (90 min)	51.0%	100.0%
Recommended reading	Basic literature	1. E. Lundanes, L. Reubsaet, T. Greibrokk, Chromatography: Basic Principles, Sample Preparations and Related Methods. John Wiley and Sons, 2013. 2. S. Bell, Forensic Chemistry, CRC Press, 2022.	
	Supplementary literature	Scientific articles on chemical analysis in criminology.	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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