

Subject card

Subject name and code	Diploma lecture - Modern technologies in environmental analysis, PG_00154765						
Field of study	Biology						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2026/2027		
Education level	Master's studies		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		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	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		3.0		17.0	50
Subject objectives	1. To familiarize students with the basic knowledge of environmental pollution 2. To introduce students to risk assessment and toxic effects of pollutants on organisms 3. To familiarize students with the main steps of the analytical process 4. To introduce students to the basics of methods of extraction, purification and analysis of organic compounds 5. To introduce students to the principles of designing an analytical process on the basis of the nature, structure and properties of a chemical compound 6. Developing the ability to independently propose the course of a simple analytical process.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[BIOLMU2_U03] the graduate can critically analyse and select biological information, especially from electronic sources		.		[SU4] test/exam - oral or written		
	[BIOLMU2_U02] the graduate is able to make proficient use of the scientific literature of the biological speciality studied		.		[SU4] test/exam - oral or written		
	[BIOLMU2_W03] the graduate has an in-depth knowledge and understanding of research problems at the frontiers of biological sciences that require the use of advanced tools		.		[SW4] test/exam - oral or written		
	[BIOLMU2_W02] the graduate knows and applies the principle of strict, empirically based interpretation of biological phenomena and processes in research work and practical activities		.		[SW4] test/exam - oral or written		

Subject contents	Classification, sources and fate of selected environmental pollutants. The most important physicochemical properties of environmental pollutants. Stages of the analytical process. Planning the analytical process on the basis of the properties of chemical compounds. Extraction of pollutants from selected environmental matrices. Purification and separation of analyzed substances. Chromatographic and spectroscopic techniques in the analysis of environmental pollutants. The course of the analytical process with examples of selected environmental pollutants. Toxicity of chemical compounds in the environment.		
Prerequisites and co-requisites	General chemistry, organic chemistry, inorganic chemistry, analytical chemistry, physical chemistry.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written exam (120 min)	51.0%	100.0%
Recommended reading	Basic literature	Stepnowski P., Synak E., Szafranek B., Kaczyński Z. Techniki separacyjne. Wydawnictwo UG 2010. Witkiewicz Z. Podstawy chromatografii, Wydawnictwa Naukowo-Techniczne, Warszawa, 2005. Szczepaniak W. Metody instrumentalne w analizie chemicznej, Wydawnictwo Naukowe PWN, Warszawa, 2002.	
	Supplementary literature	Alloway B.J., Ayres D.C. Chemiczne podstawy zanieczyszczania środowiska, PWN, Warszawa, 1999. Van Loon G.W., Duffy S.J. Chemia środowiska, PWN, Warszawa, 2008. Namieśnik i in. Przygotowanie próbek środowiskowych do analizy, WNT, W-wa, 2000. Johnstone R.A.W., Rose M.E. Spektrometria mas. Podręcznik dla chemików i biochemików. PWN, Warszawa, 2001.	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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