University of Gdańsk

Subject card

Subject name and code	Laboratory of biological samples analysis, PG_00156231						
Field of study	Environmental Protection						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2028/2029			
Education level	Bachelor's studies		Subject group	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	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	0.0	0.0	20.0	0.0	0.0	20
	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	20		3.0	2.0	25	
Subject objectives	1. To familiarize with the basic issues concerning the nature and diversity of biological samples; 2. To familiarize with methods of extraction of organic compounds and planning of extraction procedures; 3. To familiarize with methods of purifying extracts prior to analysis; 4. To familiarize with screening methods and methods for final determinations; 5. To introduce to the possibilities and limitations of analytical techniques; 6. To develop the ability to independently design an analytical process; 7. To Introduce to the basics of method validation and determining method reliability.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OŚL3_U01] Performs tasks under supervision and independently in the field of analysis of the natural environment and the functioning of natural and man-made natural systems.	The student demonstrates the ability to plan and perform basic experiments to extract compounds from biological matrices; can perform simple qualitative and quantitative determinations;	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report [SU4] test/exam - oral or written
[OŚL3_K01] Behaves in a professional manner at all times; bears full responsibility for the actions taken relating to the protection of the environment and respects the principles of professional ethics and principles of intellectual honesty.	The student is responsible for the safety of his/her own work and that of others: is careful in handling chemical substances, is prudent in handling measuring apparatus.	[SK1] oral statement/conversation/ discussion [SK2] presentation/project/paper/ report [SK4] test/exam - oral or written
[OŚL3_W05] Explains the course of natural and anthropopressional physical, chemical and biological processes and phenomena occurring in nature at various levels of matter organisation.	The student is able to select an appropriate analytical procedure for the specificity of the test compounds and the nature of the matrices; explains the possible effects of the observed presence of chemical compounds in the environment	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[OŚL3_U04] Uses specialist language in the discussion and properly uses the nomenclature in the field of environmental protection and individual disciplines related to it.	The student discusses issues related to chemical analysis of biological samples in understandable language, using correct nomenclature.	[SU2] presentation/project/paper/ report [SU4] test/exam - oral or written
[OŚL3_W06] Characterises levels of life organization, biodiversity and the interaction of organisms and the environment.	The student discusses the relationship between the results obtained from the analysis of compounds in biological samples and possible factors affecting these results.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[OŚL3_W02] Characterises the relationships and relationships between various disciplines of natural sciences and science, uses knowledge of mathematics, physics, chemistry and biology in the description of basic concepts, concepts and principles in environmental protection.	The student correctly solves tests and answers open questions on the knowledge of chemical analysis of biological samples and can propose a procedure for extraction and purification of test compounds based on their properties and the nature of the biological matrix;	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report

Subject contents

Practical introduction to extraction and purification processes. Extraction of compounds from biological matrices. Preliminary and group determination. Spectrophotometric and chromatographic analyses of organic compounds with different properties.

Prerequisites and co-requisites

Knowledge of the basics of general, inorganic, organic and analytical chemistry including: structure and physicochemical properties of basic groups of organic and inorganic compounds, knowledge of chemical nomenclature, ability to apply basic formulas from stoichiometry, calculation of concentrations of solutions, knowledge and ability to use laboratory glassware, operation of basic measuring instruments, application of safety rules for working in a chemical laboratory.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory reports (120 min)	51.0%	50.0%
Short written tests (10 min)	51.0%	50.0%

Recommended reading

Basic literature	Szczepaniak W. Metody instrumentalne w analizie chemicznej. PWN, Warszawa, 2005 Witkiewicz Z. Podstawy chromatografii, WNT, Warszawa, 2005. Namieśnik J., Jamrógiewicz Z., Pilarczyk M., Torres L. Przygotowanie próbek środowiskowych do analiz. WNT, Warszawa, 2000. Namieśnik J., Łukasiak J., Jamrógiewicz Z. Pobieranie próbek środowiskowych do analiz. PWN, Warszawa, 1995.
Supplementary literature	Stepnowski P., Synak E., Szafranek B., Kaczyński Z. Techniki separacyjne. Wydawnictwo UG, Gdańsk, 2010
eResources addresses	

Example issues/ example questions/ tasks being completed

Work placement	Not applicable

Document generated electronically. Does not require a seal or signature.