



Subject card

Subject name and code	MONITORING AND ANALYTICS OF ENVIRONMENTAL POLLUTANTS, PG_00066000						
Field of study	Green Technologies						
Date of commencement of studies	February 2027		Academic year of realisation of subject		2027/2028		
Education level	second-cycle studies		Subject group		Obligatory subject group in the field of study 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	1		Language of instruction		English		
Semester of study	2		ECTS credits		6.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department of Analytical Chemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Marek Tobiszewski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	45.0	0.0	15.0	75
	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	75		10.0		65.0	150
Subject objectives	Aim of the subject is familiarization with the basic ideas of monitoring and environmental analytics.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U06] conducts a critical analysis of the functioning of existing technical solutions in the field of environmental protection technology, and a preliminary economic analysis of the engineering activities undertaken		is able to use environmental standards, is able to select standard procedures to determine the compliance of the environmental condition with standards		[SU3] Assessment of ability to use knowledge gained from the subject		
	[K7_U02] selects analytical, simulation and experimental methods for research and analysis of environmental pollution using appropriately selected equipment and software		understands the analytical techniques used in monitoring the state of the environment		[SU4] Assessment of ability to use methods and tools		
	[K7_K03] understands non-technical aspects and effects of graduates' activities, including the impact on the environment		is able to use different sources of knowledge		[SK5] Assessment of ability to solve problems that arise in practice		
	[K7_W03] identifies equipment used in environmental pollution analysis, industrial waste purification and neutralization technology, and water and sewage management, necessary for designing and supervising environmentally friendly technologies		knowledge on environmental monitoring		[SW3] Assessment of knowledge contained in written work and projects		

Subject contents	Course content – lecture Sources of information for analysis. Method of citation literature sources. Basic problems trace analysis. Range of concentrations of trace analysis. Separation and enrichment of trace elements. The general scheme of trace analysis. Developments in analytics and environmental monitoring. Analyst speciation. Bioanalytyka and biomonitoring. Methods of sampling and preparation of environmental samples for analysis. Issues of representativeness. Technology pre-enrichment and isolation of contaminants from water and air. Sampling device. Preparation of samples. Selected methods and techniques of determination of air pollution, water and soil. Techniques of the final determinations. Detectors. The development results. The problem of calibration of measuring instruments. Methods of preparation of reference mixtures. The aggregate indicators for assessing environmental pollution. Elimination of background constituents on the results of the determinations. Assess the usefulness of summary indicators of the degree of environmental contamination. Characteristics and evaluation of commercial apparatus for control of environmental pollution. Basic groups of chemical methods for determining water pollution and soil. Quality assurance and control results (QA / QC). Validation of analytical methodologies. Reference materials. Laboratory: Determination of organic and inorganic environmental contaminants (heavy metals, TOC, PAHs, pesticides, TBT) in different matrices (water, wastewater, food) with the most modern analytical methods (GC-MS, HPLC, GC-DAI-ECD, CI, izatochoforeza).		
Prerequisites and co-requisites	Knowledge of the theoretical foundations of instrumental techniques Knowledge of the course: Chemistry, Physical Chemistry		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		60.0%	30.0%
		60.0%	30.0%
		60.0%	40.0%
Recommended reading	Basic literature	-	
	Supplementary literature	-	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Practical activities within the subject	Not applicable		

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