GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	MONITORING AND ANALYTICS OF ENVIRONMENTAL POLLUTANTS, PG_00066000		
Field of study	MONITORING AND ANALYTICS OF ENVIRONMENTAL POLLUTANTS		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2026/2027
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_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] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym
[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] Ocena umiejętności rozwiązywania problemów występujących w praktyce
[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] Ocena umiejętności korzystania z metod i narzędzi
[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] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu

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. Bioanalityka 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%	40.0%
	60.0%	30.0%
	60.0%	30.0%

Recommended reading

Basic literature	-
Supplementary literature	-
eResources addresses	

Example issues/ example questions/ tasks being completed	
Practical activites within the subject	Not applicable

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