University of Gdańsk

Subject card

Subject name and code	Environment monitoring, PG_00033330						
Field of study	Environmental Protection						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2026/2027		
Education level	Bachelor's 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	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		3.0		
Learning profile	academic		Assessment form		exam		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Magda Caban				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	45.0	0.0	0.0	0.0	0.0	45
	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	45		8.0		22.0	75
Subject objectives	Familiarizing students with basic information about environmental monitoring systems, types of water, soil and atmosphere pollution, methods of measuring pollutants in environmental samples Familiarizing students with the basics of biological monitoring, taking into account marine specificity Introducing students to the basics of calculations necessary for the correct interpretation of results Developing the ability to independently design the analytical process and solve problems while conducting measurements.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OŚL3_U02] Plans, selects appropriate research and measuring equipment and devices, performs physicochemical measurements and experiments; analyses the results and draws conclusions based on them.	1. Demonstrates the ability to carry out basic measurements of selected water, air and soil pollutants using analytical and instrumental methods.	[SU4] test/exam - oral or written
[OŚL3_U10] Participates in the analyses and evaluation of alternative solutions to environmental problems and selects methods and instruments to rationally resolve them.	1. Applies basic techniques and research tools for environmental monitoring. 2. Evaluates the obtained results using basic statistical tools. 3. Talks about environmental monitoring issues in understandable language. 4. Formulates opinions on basic environmental monitoring issues.	[SU1] oral statement/conversation/ discussion
[OŚL3_K04] Demonstrates responsibility for the safety of her/ his own and others' work and for the workplace, and correctly follows the rules of conduct in emergencies.	1. Demonstrates creativity in working independently and in a team. 2. Is responsible for the safety of one's own work and that of others: knows how to act in hazardous situations, is careful when dealing with chemical substances, and is prudent when dealing with measuring equipment.	[SK1] oral statement/conversation/ discussion
[OŚL3_U06] Uses available sources of information and understands literature in the field of environmental protection, chemistry and natural sciences.	1. Understands the literature and legal acts regarding environmental monitoring in the native language. 2. Follows established analytical procedures for measurements. 3. Is able to prepare a well-documented study of measurement results in the field of environmental monitoring in Polish.	[SU4] test/exam - oral or written
[OŚL3_W07] Explains the causal relationship between the content of specific pollutants and the state of the environment (including human health) and the occurrence of adverse phenomena on a local, regional and global scale.	1. Characterizes and understands quality standards for all elements of the environment. 2. Recognizes and names the basic problems of marine environment pollution. 3. Knows the basic legal acts regarding environmental monitoring.	[SW4] test/exam - oral or written
[OŚL3_W11] Discusses measurement systems and analysis techniques used in monitoring the state of the natural environment.	1. The student understands the principles of operation of the State Environmental Monitoring. 2. Identifies and recognizes the types and types of the main chemical pollutants of the environment. 3. Defines the sources and causes of environmental pollution. 4. Understands and defines the basic methods of monitoring surface and groundwater, soil and atmosphere. 5. Illustrates and describes the basic principles of environmental monitoring.	[SW1] oral statement/ conversation/discussion
[OŚL3_K06] Knows and appreciates the practical application of the acquired knowledge and skills in solving problems.	1. Understands the need for further education. 2. To a basic extent, it consciously assesses the impact of human activities on the natural environment.	[SK4] test/exam - oral or written

Subject contents

General information on the goals and principles of environmental monitoring, State Environmental Monitoring, national and international monitoring networks, collection and processing of environmental data. Quality standards for environmental elements, in particular water. Contaminant measurement methods (reference methodologies), spectroscopic methods, chromatographic methods, titration methods and others. Processing of analytical data and their statistical evaluation. Principles of integrated monitoring. Biological monitoring. Environmental monitoring of the Baltic Sea.

Prerequisites and co-requisites

Knowledge of physicochemical properties of chemical compounds important in their determination, theoretical foundations of analytical methods

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
exam with open and closed questions	51.0%	100.0%

Recommended reading	Basic literature	Stepnowski P., Synak E., Szafranek B., Kaczyński Z. *Monitoring i analityka zanieczyszczeń w środowisku*, Wydawnictwo UG, Gdańsk 2010.
	Supplementary literature	Namieśnik J., Chrzanowski W., Szpinek P. (Red.) *Nowe Horyzonty i Wyzwania w Analityce i Monitoringu Środowiska*, CDAMŚ Gdańsk, 2003. Staszewski R. *Kontrola chemicznych zanieczyszczeń środowiska, Podstawy teoretyczne z ćwiczeniami laboratoryjnymi*, Politechnika Gdańska, Gdańsk, 1990. Namieśnik J. *Metody instrumentalne w kontroli zanieczyszczeń środowiska*, Politechnika Gdańska, Gdańsk, 1992. Kocjan R. *Chemia analityczna. Podręcznik dla studentów*. Tom 2. PZWL, Warszawa, 2000. Szczepaniak W., *Metody instrumentalne w analizie chemicznej*, PWN, Warszawa, 1996.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Reference methods and techniques in environmental protection and monitoring. Types of impurities and methods of their determination using spectrometric and chromatographic techniques. Pollution by light, noise, ionizing and electromagnetic radiation. Quantification methods and validation methods. Collection and extraction of various types of samples. Environmental quality standards.	
Work placement	Not applicable	

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