

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Monitoring and Analytics of Pollutants, PG_00045468							
Field of study	Chemical Technology							
Date of commencement of studies	February 2024		Academic year of realisation of subject			2024/2025		
Education level	second-cycle studies		Subject group		Optional subject group 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			Polish		
Semester of study	2		ECTS credits			6.0		
Learning profile	general academic profile		Assessment form			exam		
Conducting unit	Department Of Analy	-> Faculty Of Chemistry -> Wydziały Politechniki Gdańskiej					j	
Name and surname	Subject supervisor		dr hab. inż. Marek Tobiszewski					
of lecturer (lecturers)	Teachers		dr hab. inż. Marek Tobiszewski					
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Project		Seminar	SUM
of instruction	Number of study hours	30.0	0.0	30.0 15.0			0.0	75
	E-learning hours inclu	uded: 0.0				-		
Learning activity and number of study hours	Learning activity	Participation in classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM
	Number of study hours	75		10.0		65.0		150
Subject objectives	The aim of the subject is getting knowledge from environmental and monitoring of environment and legislation. The aim is improvement of analytical laboratory practice.							
Learning outcomes	Course outcome		Subject outcome		Method of verification			
	K7_K02							
	K7_U05							
	K7_U04							
Subject contents	Organizational classe	es the role of a	l nalytics and ter	rminology Trac	e analvt	tics prol	olems Priority r	ollution
Subject contents	Speciation analytics biomonitoring Green analytical chemistry Monitoring networks. Telemonitoring Anthropocene Validation of analytical procedures Passive samplers micro-plastics Radon analysis. Asbestos analysis Metabolomics and Proteomics Indoor air guality Zero exam							
Prerequisites and co-requisites	basic knowledge from environmental chemistry and analytical chemistry							
Assessment methods	Subject passing criteria		Passing threshold		Percentage of the final grade			
and criteria	mean from laboratory classes		50.0%		30.0%			
	project		50.0%		20.0%			
	examination		50.0%		50.0%			
Recommended reading		zbiorowa pod red. J. Namieśnika, skrypt PG, Gdańsk 1992 Secondary effects and pollutants of the environment, J. Namieśnik, T. Górecki, W. Wardencki, B. Zygmunt, L. Torres, skrypt PG, Gdańsk 1993Pobieranie próbek środowiskowych do analizy, J. Namieśnik, J. Łukasiak, Z. Jamrógiewicz, PWN, Warszawa 1995 Fizykochemiczne metody kontroli zanieczyszczeń środowiska, praca zbiorowa pod red. J. Namieśnika i Z. Jamrógiewicza, PWN, Warszawa 1998 Przygotowanie próbek środowiskowych do analizy, J. Namieśnik, Z. Jamrógiewicz, M. Pilarczyk, L. Torres, WNT, Warszawa 2000 Pestycydy, występowanie, oznaczanie i unieszkodliwianie, praca zbiorowa pod red. M. Biziuka, WNT, Warszawa 2001 Kontrola i zapewnienie jakości wyników pomiarów analitycznych, praca zbiorowa pod red. P. Konieczki i J. Namieśnika, WNT, Warszawa 2007 Zarys ekotoksykologii, praca zbiorowa pod red. J. Namieśnika i J. Jaśkowskiego, EKO-Pharma, Gdańsk 1995						

Supplementary literature	-
eResources addresses	Adresy na platformie eNauczanie:

Example issues/	Goals of environmental monitoring. What environmental compartments are monitored?
example questions/	
	Basic analytical metrological parameters.
	Why extraction is performed before final determination?
	What is the goal of environmental tracers application? Give examples of environmental tracers. What requirements should it meet?
	What are processes that lead to loss of liquid sample representativeness. What are the measures to avoid them?
	What is speciation analysis? Explain terms: group speciation, individual speciation, screening speciation and physical speciation. Give examples.
	What are advantages of total parameters application over more traditional approach to monitoring?
	What are advantages of biomonitoring over more traditional approach to monitoring?
	What are the requirements for bioindicator organism? Give examples of such organisms
	Suggest analytical technique that can be applied to determine benzene in water samples. Suggest appropriate sampling technique, sample preparation and final determination technique.
	List 5 solventless sample preparation techniques and describe two of them.
	Principles of dispersive liquid-liquid microextraction technique.
	List the elements of quality assurance/quality control system.
	Suggest analytical technique that can be applied to determine toluene in the air during this examination. Suggest appropriate sampling technique, sample preparation and final determination technique.
	Freons physicochemical properties, areas of application, environmental concerns and their naming.
	Burial sites genesis, environmental problems, remediation.
	Characteristics of the sample collected for analysis.
	What is environmental fate of contaminants? Explain: emission, imission and transboundary pollutants.
	What are the modes of location of analytical device in relation to investigated object? Which mode is the most beneficial and why?
	Characteristics of clean rooms.
	Process of ultrapure water production.
	What parameters are TEQ and TEF?
	What is environmental specimen bank?

	Role and tasks of environmental specimen banks.
	Describe aspiration, sedimentation and isolation modes of samples collection. Give examples.
	What are total parameters. What are advantages of their application. Give examples.
	Ways of total hydrocarbons parameter determination in air samples.
	What is the principle of SYMBIO system operations?
	Pros and cons of SF_6 application as environmental tracer.
	Principle of emission measurement by environmental tracing method.
	Application of environmental tracers. Describe areas of application.
	What compounds are applied as environmental tracers? Give examples.
	Features of ideal environmental tracer.
	Explain terms: bioavailability, bioaccumulation, bioconcentration, biomagnification and biotransformation.
	What are the features of organism to be used in BEWS?
	Why toxicological tests should be introduced to environmental monitoring? What are the limitations of chemical monitoring?
	What is derivatization and what is its purpose?
	Factors influencing concentration of radon in habituated buildings.
	Describe SPME extraction.
	Factors influencing SPME extraction efficiency.
	Discuss stationairy phases applied in SPME fibres. Discuss SPME sorbent selection process.
Work placement	Not applicable

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