



## Subject card

Subject name and code	Management and Environmental Monitoring, PG_00046021						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2023/2024		
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	2		Language of instruction		English		
Semester of study	3		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Environmental Engineering Technology -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Magdalena Gajewska				
	Teachers		prof. dr hab. inż. Magdalena Gajewska  dr inż. Magda Kasprzyk				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	15.0	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		2.0		13.0	60
Subject objectives	The aim of the course is to familiarize students with the principles of monitoring and assessing the quality of individual elements of the environment and the principles of environmental management with an indication of future challenges.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W08] has knowledge necessary to understand the social, economic, legal and other non-technical determinants of engineering activities and their incorporation in engineering practice	has the knowledge necessary to understand social, economic, legal and other non-technical conditions of engineering activities and to take them into account in engineering practice	
	[K7_U08] is able to assess risks in the implementation of engineering projects and implement appropriate safety rules	is able to assess threats in the implementation of engineering projects	
	[K7_U03] can elaborate detailed documentation presenting results of an experiment, design or research task; can prepare a paper to discuss the results	is able to develop detailed documentation of the results of the experiment, project or research task; can prepare a study discussing these results	
	[K7_U01] can obtain information from literature, databases and other sources; can integrate the obtained information, interpret and critically evaluate them, draw conclusions, and formulate and comprehensively justify the opinions	can obtain information from literature, databases and other sources; is able to integrate obtained information, interpret and critically evaluate it, as well as draw conclusions and formulate and comprehensively justify opinions	
	[K7_W03] has in-depth, structured and theoretical knowledge related to the environmental chemistry, environmental management and monitoring, or the technology and organization of installation works or measurements in environmental engineering	has deepened, ordered and theoretically founded knowledge related to environmental chemistry, management and monitoring of the environment or technology	
Subject contents	<p>The subject is dedicated to two issues:</p> <p>1. First is monitoring of the environment- different component of the environment like water, air, soil and its reliability. The monitoring of water bodies is discussed based on Water Framework Directive 2000/60/EU. Air Chemistry, Pollutions, Monitoring and Control.</p> <p>Case study of Air Quality Index based on air quality monitoring in different cities is elaborated with in the practical exercise.</p> <p>.</p> <p>2. Second is management and covers:</p> <p>Historical development of environmental strategies for protection and management, regulations, demands, needs as well as tools and strategies like clean technologies, LCA, issues connected to climate change and mitigation of its; City resilience and demand for future to cope with climate change. Examples of adaptation and mitigation actions on different levels – personal (individual), municipal and governmental are the issue for practical exercise.</p> <p>The importance and challenges for wastewater management in circular economy. The IWA principles for Water Wise Cities as well as Water Sensitive Urban Design (WSUD) and Blue –Green Design approach are discussed with in the issue of modern stormwater management in Cities 2050. Nature Based solution as a tool for sustainable environment management are discussed based on Treatment wetland for water pollution control cases.</p>		
Prerequisites and co-requisites			

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	preparation of the presentation	60.0%	100.0%
Recommended reading	Basic literature	Gajewska M. (2019). ZłoŜa hydrofitowe z pionowym przepływem ścieków. Charakterystyka procesów i zastosowań. Monografie Komitetu InŜynierii Środowiska PAN nr 150, Warszawa 2019:309s  Wetland Technology, Practical Information on the Design and Application of Treatment Wetlands ed G. Lungergraber , G. Dotro, J. Nivala, A. Rizzo, O. Stein	
	Supplementary literature	laws and regulations and <a href="https://naukaoklimacie.pl/">https://naukaoklimacie.pl/</a>	
	eResources addresses	Adresy na platformie eNauczanie:	
	Example issues/ example questions/ tasks being completed	1. Technologies for recovery of bioavailable phosphorus compounds - phosphorus in the environment, resources, needs 2. Regional monitoring on the example of the Pomeranian Voivodeship 3. Carbon dioxide - sources of emissions, ways to reduce them, the greenhouse effect, truth and myths 4. Rules for monitoring groundwater and surface waters. Surface water classification systems in Poland and the EU 5. Smart Cities - challenges and opportunities 6. Reclamation of water reservoirs - goals, methods, restrictions	
Work placement	Not applicable		