



Subject card

Subject name and code	Groundwater and Soil Protection, PG_00059995										
Field of study	Environmental Engineering										
Date of commencement of studies	February 2026	Academic year of realisation of subject		2025/2026							
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	1	ECTS credits		5.0							
Learning profile	general academic profile		Assessment form		assessment						
Conducting unit	Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology										
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Adam Szymkiewicz								
	Teachers										
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM				
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60				
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	60		5.0		62.0	127				
Subject objectives	To familiarize students with the main sources of contaminants in soil-groundwater environment, mechanisms of contaminant transport, methods of soil and groundwater protection and clean-up										
Learning outcomes	Course outcome		Subject outcome			Method of verification					
	[K7_W11] has knowledge to analyze, evaluate and optimize processes, objects and systems of environmental engineering and knows the principles of rational energy management and resources		student knows the principles of rational and sustainable management of groundwater resources			[SW2] Assessment of knowledge contained in presentation					
	[K7_U08] is able to assess risks in the implementation of engineering projects and implement appropriate safety rules		student is able to identify the threats to quality and quantity of groundwater resources, related to engineering activity			[SU2] Assessment of ability to analyse information					
	K7_U10		student is able to design elements of soil and groundwater remediation systems			[SU4] Assessment of ability to use methods and tools					
	K7_U12		student is able to evaluate usefulness of selected systems for protection and remediation of soil and groundwater			[SU4] Assessment of ability to use methods and tools					
	K7_W09		student has in-depth knowledge about groundwater hydrology as well as protection and management of groundwater resources			[SW2] Assessment of knowledge contained in presentation					
Subject contents	Course content – lecture Flow in unsaturated and saturated zone, types of contaminants and their sources, mechanisms of contaminant transport, methods of groundwater protection, methods of soil and groundwater remediation										
Prerequisites and co-requisites	Basic knowledge of hydrology, geology and chemistry										

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade		
	exercises: individual or group assignments	50.0%	100.0%		
	lecture: attendance	80.0%	0.0%		
Recommended reading	Basic literature Bhandari, Alok Surampalli, Rao Y. Champagne, Pascale Ong, Say Kee Tyagi, R. D. Lo, Irene M. C.. (2007). Remediation Technologies for Soils and Groundwater. American Society of Civil Engineers (ASCE). Retrieved from https://app.knovel.com/mlink/toc/id:kpRTSG0007/remediation-technologies/remediation-technologies Domenico, Patrick A. Schwartz, Franklin W.. (1998). Physical and Chemical Hydrogeology (2nd Edition). John Wiley & Sons. Retrieved from https://app.knovel.com/mlink/toc/id:kpPCHE0002/physical-chemical-hydrogeology/physical-chemical-hydrogeology				
	Supplementary literature	https://www.itrcweb.org/Guidance			
	eResources addresses				
Example issues/ example questions/ tasks being completed	distribution of organic contaminants between solid, liquid and gas phases, determination of well capture zone, solution of 1D advection-diffusion equation				
Practical activites within the subject	Not applicable				

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