



Subject card

Subject name and code	, PG_00071158						
Field of study	Recycling and Energy Recovery						
Date of commencement of studies	October 2023	Academic year of realisation of subject				2025/2026	
Education level	first-cycle studies	Subject group				Optional subject group	
Mode of study	Full-time studies	Mode of delivery				at the university	
Year of study	3	Language of instruction				Polish	
Semester of study	6	ECTS credits				2.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Geotechnical and Hydraulic Engineering -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Marzena Wójcik				
	Teachers		dr inż. Marzena Wójcik				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	10.0	10.0	0.0	10.0	0.0	30
	E-learning hours included: 0.0						
	eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=5058						
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	30		0.0		0.0	30
Subject objectives	"Acquainting the student with the mechanisms of groundwater formation and flow, their exploitation possibilities, and potential hazards. Familiarizing the student with basic legal regulations regarding the assessment and classification of soil and groundwater contamination levels, as well as methods for ground remediation.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W03] identifies problems and phenomena related to the recovery of raw materials and energy as well as applicable concepts, standards and design methods and is aware of their limitations.	The student is able to evaluate and classify soil and groundwater contamination levels and to propose methods for ground remediation			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_W07] demonstrates knowledge and understanding of Polish and European law in the field of entrepreneurship, waste management, circular economy, health and safety rules and industry standards.	The student knows the basic Polish and European legal regulations concerning the assessment and classification of soil and groundwater contamination levels			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U05] plans, prepares and conducts engineering activities in the field of raw materials and energy recovery, applying practical knowledge and understanding of the specificity of materials, devices and tools, processes and technologies.	The student is able to design ground remediation processes			[SU1] Assessment of task fulfilment		
	[K6_U07] creates solutions aimed at implementing legal regulations and managing raw materials/ waste on the premises of the company, as well as organizing work in accordance with legal standards and health and safety regulations.	The student is able to design ground remediation processes according to legal regulations			[SU1] Assessment of task fulfilment		

Subject contents	Course content – lecture Groundwater in the hydrological cycle. Occurrence of groundwater; origin and age of waters. Hydrogeological properties of rocks and soils. Groundwater flow. General principles of land reclamation for degraded areas. Legal basis. Identification and characterization of contaminated sites. Methods of soil and groundwater remediation. Reclamation of waste heaps and landfills. Soil remediation methods technical, chemical, and biological reclamation.		
	Course content – exercises Analysis of contamination levels in soil and groundwater. Determination of hydrogeological parameters. Assessment of natural attenuation in soil		
	Course content – project Analysis of hydrogeological conditions based on a hydrogeological cross-section. Designing soil and groundwater remediation .		
Prerequisites and co-requisites	Basic knowledge of mathematics; fundamentals of hydrology		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Assessment of assignments and projects	50.0%	100.0%
Recommended reading	Basic literature	Domenico P.A., Schwartz F.W., Physical and chemical hydrogeology, Wiley, 1998	
	Supplementary literature	Domenico P.A., Schwartz F.W., Physical and chemical hydrogeology, Wiley, 1998	
	eResources addresses	Basic http://remea.pl - Investigation methods for contaminated soils https://instytutremediacji.pl - best practices in remediation	
Example issues/ example questions/ tasks being completed	Provide examples of groundwater contamination sources		
	Construct a hydrogeological cross-section based on borehole data.		
	Remediation methods in the vadose and saturated zones.		
Practical activities within the subject	Not applicable		

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