



Subject card

Subject name and code	Ground Reclamation , PG_00042896						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2021/2022		
Education level	first-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	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Lech Bałachowski				
	Teachers		dr inż. Marzena Wójcik				
			prof. dr hab. inż. Lech Bałachowski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	15.0	0.0	45
	E-learning hours included: 0.0						
	Adresy na platformie eNauczanie:						
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		5.0		35.0	85
Subject objectives	Classification of soil and ground water contamination. Types of contamination. Remediation methods. Estimation of subsoil susceptibility to remediation. Material recycling and reuse of materials in civil engineering.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_K02] understands the need to formulate and communicate to the public information and opinions on the achievements of environmental engineering and other aspects of the sanitary industry engineer's activity; is aware of the importance and understands the non-technical aspects and effects of engineering activities; makes efforts to provide such information and opinions in a widely understandable way, presenting different points of view	Student knows changes in law concerning soil remediation.	[SK5] Assessment of ability to solve problems that arise in practice
	[K6_U16] can, when formulating and solving engineering tasks in environmental engineering, evaluate, select and apply appropriate methods and tools, recognize their non-technical aspects, including environmental, economic and legal aspects	Student is able to apply different methods of soil remediation.	[SU4] Assessment of ability to use methods and tools
	[K6_W04] possesses elementary knowledge in the field of land mechanics, ground science, land reclamation and geotechnics; has basic knowledge about the composition of air, water and soil, environmental pollution and processes responsible for their formation and ways to reduce them, knows the principles and organization of sustainable water management	Student is able to describe the migration of contamination in ground water and knows the rules for ground water protection.	[SW1] Assessment of factual knowledge
Subject contents	<p>Lecture: Soil degradation, general rules for soil remediation. Basic law. Estimation and characteristic of contaminated soil. Monitoring and measurements of soil/ground water contamination. The methods for soil remediation. Remediation of post-mining areas and closed waste disposals. The ways of soil remediation - technical, chemical and biological. The example of remediation. The use of wastes. Reuse, recycling and by-products application. Soil erosion. Biotechnical methods in soil remediation and protection.</p> <p>Project: Analysis of contaminants level in subsoil and ground water. The application of soil and ground water remediation methods.</p>		
Prerequisites and co-requisites	Basic knowledge concerning soil mechanics, chemistry and hydraulic		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Tests during semester	50.0%	50.0%
	Project	50.0%	50.0%
Recommended reading	Basic literature	International conference on waste disposals, Sardegna, Italy.	
	Supplementary literature	Proceedings of international conference	
		Journal of Geoenvironmental and Geotechnical Engineering ASCE	
		Waste management	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Estimation of subsoil remediation applicability		
	Impact of contamination on subsoil characteristics		
	Remediation methods in vadose and saturation zones		
Work placement	Not applicable		