



Subject card

Subject name and code	, PG_00064670						
Field of study	Recycling and Energy Recovery						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2024/2025		
Education level	first-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	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						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Angelika Duszyńska					
	Teachers	dr inż. Angelika Duszyńska dr inż. Anna Gumuła-Kawęcka					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	10.0	0.0	0.0	0.0	30
	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	30		0.0		0.0	30
Subject objectives	The aim of the course is to familiarize students with issues related to soil, the use of alternative materials (in civil and environmental engineering) and sustainable development.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W04] demonstrates knowledge and understanding of research methods (information acquisition, simulations, experimental methods) in the field of technologies related to the recovery of raw materials and energy.	The student demonstrates understanding of research methods (information acquisition) in the field of technologies related to the recovery of raw materials and energy.			[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		
	[K6_U04] formulates research problems and selects appropriate research methods (information acquisition, simulations, experimental methods) in the field of technologies related to the recovery of raw materials and energy in order to solve specific tasks and to report research results.	The student selects appropriate research methods in the field of technologies related to the recovery of raw materials and energy in order to solve tasks related to sustainable development.			[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
	[K6_U01] applies knowledge of mathematics and other exact sciences and engineering disciplines to solve theoretical, engineering and technological problems and issues.	The student applies knowledge from various disciplines to solve geoengineering problems related to the environment shaping.			[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	[K6_W01] demonstrates knowledge and understanding of mathematics and other exact sciences and engineering disciplines at the level necessary to solve theoretical, engineering and technological problems and issues.	The student understands science and uses it to solve problems related to, among others, soil and alternative materials.			[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation		

Subject contents	Earth's structure. Basic soil characteristics. Earth's natural resources and their use. Carbon footprint and possibilities of its reduction. Shaping the environment. Reclamation of degraded areas. Use of anthropogenic materials in geoenvironmental engineering. Geosynthetics as support for sustainable development.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	presentation	60.0%	40.0%
	test	60.0%	60.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>Jastrzębska M. i inni: Zrównoważona Geotechnika 1. Wybrane materiały alternatywne. PWN Warszawa 2024</li> <li>Pisarczyk S.: Mechanika gruntów. OWPW, Warszawa 2017 (2022).</li> <li>Wiłun Z.: Zarys geotechniki. Wydawnictwo Komunikacji i Łączności, Warszawa 2024.</li> </ol>	
	Supplementary literature	<ol style="list-style-type: none"> <li>Bzówka J. i inni: Geotechnika komunikacyjna. Wydawnictwo Politechniki Śląskiej. 2015</li> <li>Bolt A., Cichy W., Topolnicki M., Zadroga B.: Mechanika gruntów w zadaniach. Skrypt PG. Gdańsk 1985.</li> <li>Pisarczyk S.: Grunty nasypowe. Właściwości geotechniczne i metody ich badania. OWPW, Warszawa 2004.</li> <li>Stryczek S.: Podstawy geoinżynierii. Wydawnictwo AGH. Kraków 2021</li> <li>Wesołowski A. i inni: Geosyntetyki w konstrukcjach inżynierskich. Wydawnictwo SGGW. Warszawa 2000.</li> <li>Zadroga B., Olańczuk-Neyman K.: Ochrona i rekultywacja podłoża gruntowego. Aspekty geotechniczno-budowlane. Wyd. PG, 2001.</li> </ol>	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Rock and soil identification. Types of anthropogenic/alternative materials. Geosynthetics support sustainable development. Zero-emission construction. Energy resources.		
Work placement	Not applicable		

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