



## Subject card

Subject name and code	Landfills, PG_00048030						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject				2022/2023	
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	Part-time studies	Mode of delivery				at the university	
Year of study	2	Language of instruction				Polish	
Semester of study	3	ECTS credits				3.0	
Learning profile	general academic profile	Assessment form				exam	
Conducting unit	Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marzena Wójcik					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	0.0	0.0	10.0	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	5.0	55.0	90		
Subject objectives	The course broadens students understanding of basic regulations concerning on the landfills, its locations, waste volume and earthwork calculations. Student become acquainted with geosynthetics used on landfills and rules for calculating their strength, construction stability. The course enable student to design the seal of the construction, leaking proteprotection , and system for leachate drainage.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_W05] has basic knowledge in general construction or in water or sanitary or hydrotechnical or road construction; the impact of construction investments on the environment	The course broadens students understanding of environmental impacts of landfills			[SW1] Assessment of factual knowledge		
	[K7_U07] can plan and carry out laboratory and field experiments leading to assessment of the efficiency of water treatment, waste water treatment, waste management and sewage sludge management	Students have knowledge of waste and leachate management			[SU1] Assessment of task fulfilment		
	[K7_W07] has an in-depth, structured and theoretical knowledge of municipal management, including water treatment and water renewal technologies, various types of wastewater treatment technologies, including landfill leachate, sewage sludge treatment technologies; knowledge of natural methods used in water and wastewater treatment or construction, functioning, operation and closure of waste landfills	Students have knowledge of waste management, rules of the landfills construction, exploitation and closing and leachate management.			[SW1] Assessment of factual knowledge		
	[K7_U03] can elaborate detailed documentation presenting results of an experiment, design or research task; can prepare a paper to discuss the results	The course enable student to design the seal of the construction, leaking protection , and system for leachate drainage and present its results..			[SU5] Assessment of ability to present the results of task		

Subject contents	The course broadens students understanding of basic regulations concerning on the landfills, its locations, waste volume and earthwork calculations. Student become acquainted with geosynthetics used on landfills and rules for calculating their strength, construction stability according to EC7. The course enable student to design the seal of the construction, leaking protection , system for leachate drainage, systems for landfill degassing and monitoring.		
Prerequisites and co-requisites	knowledge from hydrogeology and soil mechanic		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	egzam	60.0%	50.0%
	project	60.0%	50.0%
Recommended reading	Basic literature	Council Directive 1999/31/EC of 26 April 1999 on the landfill of wastes. Official  Journal L182, 16/07/1999	
	Supplementary literature	Sharma H.D., Reddy K.R. Geoenvironmental Engineering, John Wiley and Son (2004),  EC7 GEOTECHNICAL DESIGN	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Type of landfills; basic regulations concerning on the landfills, its locations, waste volume and earthwork calculations. geosynthetics used on landfills and rules for calculating their strength. Design the seal of the construction, leaking protection , and system for leachate drainage; systems for landfill degassing and monitoring.		
Work placement	Not applicable		