



Subject card

Subject name and code	, PG_00065742						
Field of study	Recycling and Energy Recovery						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2025/2026		
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	4		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Environmental Engineering Technology -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Eliza Kulbat				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	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		0.0		0.0	60
Subject objectives	Introduction to municipal waste management and disposal technologies and methods.						
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 knows and understands research methods, including information extraction, simulation, experimental methods in the field of technologies related to resource and energy recovery.		[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.		Students will be able to identify and formulate research problems in the field of waste management and select appropriate methods to solve them.		[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		
	[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 identify problems and phenomena related to the recovery of raw materials and energy from waste. He/she can present concepts, standards and design methods and is aware of their limitations.		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
Subject contents	Course content – lecture Legal basis for municipal waste management. EU waste directive, Waste Act of 14 December 2012. Hierarchy of waste management. Physical, chemical and biological properties of waste. Waste collection systems. Waste management and disposal methods: reuse, recycling, thermal methods, composting, anaerobic digestion, landfilling. Organisation and operation of municipal waste landfills. Sewage sludge as an important group of municipal waste. Legal basis for sewage sludge. Types, properties and quantities of municipal sewage sludge. Thickening and conditioning of sewage sludge. Sewage sludge stabilisation - methane digestion, aerobic biological methods and chemical methods. Sewage sludge dewatering and drying. Thermal methods of sewage sludge disposal.						
Prerequisites and co-requisites	Fundamentals of chemistry and microbiology.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Report on laboratory activities	60.0%	40.0%
	Test of lecture content	60.0%	60.0%
Recommended reading	Basic literature	1. Rosik-Dulewska C. The basics of waste management, (in Polish), PWN 2015 2. Bernd Bilitewski, Georg Hardtle, Klaus Marek, Waste management handbook (in Polish) - II wydanie Wydawnictwo:Seidel-Przywecki, ISBN: 83-919449-8-0, Wydanie:2006 3. Waste Management. Consequences of the implementation of new legislation (in Polish), Szewczyk-Cieślík Karolina, Hebda Marta, Ewa Romanowska, Wyd. Wiedza i Praktyka, 2020 3.Grygorczuk-PetersonsE.H., Tałałaj I.A. Shaping waste management in the municipality (in Polish), Podlaska Agencja Zarządzania Energią, Białystok 2007	
	Supplementary literature	Act of 14 December 2012 on waste (Journal of Laws 2013, item 21). EU directives on waste management, legal acts on waste management in force in Poland.	
	eResources addresses		
	Example issues/ example questions/ tasks being completed	Discuss the factors affecting the efficiency of the sludge thickening process. Assess the fertilising values of compost. Discuss methods of municipal waste management in Poland.	
Practical activities within the subject	Not applicable		

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