GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00059139						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2022		Academic year of realisation of subject	2025/2026			
Education level	first-cycle studies		Subject group	Optional subject group 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	4		Language of instruction	Polish			
Semester of study	8		ECTS credits	3.0			
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	15.0	10.0	0.0	0.0	0.0	25
	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	25		2.0	50.0		77
Subject objectives	Acquiring skills assessment technology related to solid waste and sewage sludge.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U10] can design basic equipment for water treatment, wastewater treatment and sludge and waste management	The student is able to design the basic devices used in sludge and waste management.	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject
[K6_W10] has elementary knowledge in the field of running a business in the sanitary industry; knows the general principles of creating and developing forms of individual entrepreneurship; knows the basic principles of health and safety at work in the laboratory and at the construction site	The student has basic knowledge about running a business in the sanitary industry, knows the basic principles of occupational health and safety in municipal management facilities.	[SW1] Assessment of factual knowledge
[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	The student understands the need to provide the society with reliable knowledge about the functioning of waste and sludge management facilities.	[SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills
[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	The student is able to choose the appropriate methods and tools for solving issues in waste and sludge management.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task

Subject contents

Course content – lecture
Organisation and legal bases of municipal solid waste management, waste hierarchy. Physical, chemical and biological properties of waste, waste collection systems. Waste management and disposal methods: reuse, recycling, thermal methods, composting, anaerobic digestion, landfill. Organization and operation of municipal waste landfills.

Legal bases for sewage sludge. Types, properties and amounts of municipal sewage sludge. Thickening and conditioning of sewage sludge. Stabilization of sewage sludge - methane fermentation, biological oxygen methods and chemical methods. Dewatering and drying of sewage sludge. Thermal methods of sewage sludge neutralization.

Prerequisites and co-requisites

Knowledge of chemistry, microbiology and wastewater technology.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
design tasks	60.0%	40.0%
test	60.0%	60.0%

Recommended reading	Basic literature	1. Rosik-Dulewska C. Basics of waste management, PWN 2015 2. Bernd Bilitewski, Georg Hardtle, Klaus Marek, Waste management manual- II wydanie Wydawnictwo:Seidel-Przywecki, ISBN: 83-919449-8-0, Wydanie:2006 3.Grygorczuk-PetersonsE.H., Tałałaj I.A. Shaping waste management in a commune, Podlaska Agencja Zarządzania Energią, Białystok 2007 4. J. B. Bień, K. Wystalska, Sewage sludge. Theory and practice, Wyd. Politechniki Częstochowskiej 2011 5. A sewage treatment plant operator's guide : praca zbiorowa / pod red. Zbysława Dymaczewskiego 6. M. Jakubus, Municipal sewage sludge. Genesis - economy, Wyd. Uniwersytetu Przyrodniczego w Poznaniu,
	Supplementary literature	EU directives on waste management, legal acts regarding waste management in force in Poland.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Discuss the factors influencing the efficiency of the sewage sludge thickening process. Discuss the methods of municipal waste management in Poland.	
Practical activites within the subject	Not applicable	

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