

Subject card

Subject name and code	Waste management, PG_00054835						
Field of study	Environmental Protection						
Date of commencement of studies	October 2025		Academic year of realisation of subject			2025/2026	
Education level	Master's 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	full-time studies		Mode of delivery			at the university	
Year of study	1		Language of instruction			Polish	
Semester of study	1		ECTS credits			2.0	
Learning profile	academic		Assessment form			credit	
Conducting unit	Laboratory of Photocatalysis -> Department of Environmental Technology -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Anna Gołębiewska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	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		5.0		15.0	50
Subject objectives	To familiarize students with the main problems related to waste management.Practical familiarization of students with waste disposal methods, waste recycling and quantitative analysis of selected waste components.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[OŚMU2_K08] Initiates and takes into account in the organizational activity the activities for the social environment and public interest.	1. Knows the negative factors of waste storage and incineration 2. Knows methods of preventing the negative impact of landfills and incineration plants on the environment	[SK4] test/exam - oral or written
	[OŚMU2_W07] Distinguishes between legal and administrative mechanisms and procedures in environmental protection and interprets its international dimension.	1. Is able to interpret legal and administrative procedures in environmental protection	[SW5] implementation of a problem task
	[OŚMU2_K04] Leads the group and bears responsibility for it.	1. Is able to work in a group and take responsibility for the group	[SK4] test/exam - oral or written [SK8] observation of student's independent or team work
	[OŚMU2_K02] Recognises threats, creates safe work conditions and is responsible for the safety of own and other people's work.	Is responsible for the safety of his own and others' work.	[SK8] observation of student's independent or team work
	[OŚMU2_U09] Interprets policy documents in the field of environmental protection in relation to Polish and international legal regulations.	1. Is able to properly determine priorities for the implementation of tasks by himself or others, 2. Maintains openness to new solutions related to waste management, 3. Explains to others the importance of proper waste management for environmental protection and respect for natural resources,	[SU4] test/exam - oral or written
	[OŚMU2_W08] Explains the mechanisms of unit processes used in environmental protection and waste management methods.	1. Knows the basic links in the waste management chain 2. Understands the need for waste recovery/recycling and how to achieve it 3. Knows the basic legal provisions regulating waste management 3. Understands the basic concepts related to waste management: recovery, disposal, recycling 4. Knows the construction of typical waste management installations 5. Knows the negative factors of waste storage and incineration 6. Knows methods of preventing the negative impact of landfills and incineration plants on the environment	[SW4] test/exam - oral or written [SW2] presentation/project/paper/report
Subject contents	Waste classification.Removing print from waste paper by flotation, cellulose determination.Hydrometallurgical recovery of silver.Plastics management raw material and energy recycling.Determination of crude fat in food products using the Soxhlet extraction method. Fly ash management.Trip to the Utilization Plant		
Prerequisites and co-requisites	entry requirements:Knowledge of the basics of general chemistry, organic chemistry, inorganic chemistryAdditional requirements:analytical chemistry		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written test for each exercise	51.0%	50.0%
	Report	51.0%	40.0%
	Activity during classes - conducting experiments	51.0%	10.0%

Recommended reading	Basic literature	1. Czesława Rosik-Dulewska, Podstawy gospodarki odpadami, PWN, Warszawa 2015. 2. Bernd Bilitewski, Georg Hardtle, Klaus Marek, Podrecznik gospodarki odpadami, teoria i praktyka, Wydawnictwo Seidel-Przeweckie, 2006. 3. Zespół autorów pod redakcją dr hab. Krzysztofa Skalmowskiego, Poradnik gospodarowania odpadami, Wydawnictwo Verlag Dashofer, Warszawa 2014.
	Supplementary literature	science publications
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Chemical recycling2. Management of fly ash	
Work placement	Not applicable	

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