GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Selected topics of Environmental Protection in Industry , PG_00066049		
Field of study	Engineering and Technologies of Energy Carriers		
Date of commencement of studies	February 2025	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Optional subject group Humanistic-social subject group
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	practical profile	Assessment form	assessment
Conducting unit	Department of Process Engineering and Chemical Technology -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Patrycja Makoś-Chełstowska	
	Teachers	dr inż. Edyta Słupek dr hab. inż. Patrycja Makoś-Chełstowska dr inż. Piotr Rybarczyk dr inż. Natalia Łukasik	

Lesson types							
	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	0.0	30.0	0.0	0.0	50
	E-learning hours included: 0.0						
	eNauczanie source addresses: Moodle ID: 2876 Wybrane zagadnienia ochrony środowiska w przemyśle https://enauczanie.pg.edu.pl/2025/course/view.php?id=2876						

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	50	10.0	15.0	75

Subject objectives	
	Presentation of issuesof environmental protection in relation to industry - in the field of applied technologies for environmental protection, monitoring of pollutant emissions as well as related to environmental impact assessment and related legal aspects.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U03] uses analytical, simulation and experimental methods of chemistry, physics and chemical engineering and technology to formulate and solve complex engineering tasks, including non-standard tasks, as well as simple research problems	The student is able to apply methods of analysing pollutant emissions and assessing the impact of technologies on the environment.	[SU4] Assessment of ability to use methods and tools
[K7_K02] is able to cooperate and work in a group, taking on different roles	The student actively participates in team-based analysis of environmental protection technologies and prepares a report.	[SK1] Assessment of group work skills
[K7_W04] explains the relationships in the life cycle of technical devices and the basic processes occurring in the life cycle of devices, objects and technical systems,	The student understands and is able to describe the life cycle of renewable energy technologies and their impact on the environment in various phases.	[SW3] Assessment of knowledge contained in written work and projects
[K7_K05] is able to assess social problems related to the energy economy	The student is able to identify and analyze the impact of environmental protection technologies and renewable energy sources on society and the economy.	[SK5] Assessment of ability to solve problems that arise in practice

Subject contents

Course content – lecture

1. Types of impact on environment and sources of environmental pollution in the industry
2. Physio-chemical basics of phenomena and technologies used for treatment of waste gases
3. Physio-chemical basics of phenomena and technologies used for treatment of water and wastewater
4. Remediation of polluted soils
5. Waste disposal and management
6. Review of legal acts related to environmental protection
7. Environmental management according to ISO 14001
8. Basics of environmental impact assessment
9. Production-integrated environmental protection in the chemical industry
10. A review of environmental aspects for selected industrial companies

Course content – laboratory

1)Technologies used in waste gas treatment
2) Water and wastewater treatment technologies
3) Remediation of contaminated soil
4) Waste disposal technologies
5) Visit to a waste disposal plant in Gdańsk for a practical introduction to the problem of odor nuisance and techniques for its identification.

Prerequisites and co-requisites

Knowledge about general, organic, inorganic, physical and analytical chemistry as well as physics.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Written test	60.0%	60.0%
Rating from the laboratory	60.0%	40.0%

Recommended reading

Basic literature

C. Christ (ed.), Production-integrated environmental protection and waste management in the chemical industry, WILEY-VCH, 1999

J.A. Tomaszek, P. Koszelnik, Progress in environmental engineering, CRC press, 2015

Standard ISO 14001

Legal acts related to environmental protection

	Supplementary literature	Scientific publications related to the subject. Reports of environmental impact assesment. Environmental reports.
	eResources addresses	
Example issues/ example questions/ tasks being completed	• Phytoremediation: Definition, Mechanisms (e.g., Phytoextraction) Principles of Operation, Examples • Factors Influencing the Selection of Soil Remediation Methods • Gas Stream Deodorization Methods: Fundamental Concepts, Comparative Analysis in Terms of Cost, Gas Flow Rate, and Efficiency • Biological Methods for Gas Purification • Methods for Cleaning Exhaust Gases (Types, Principles of Operation, Efficiency) • Environmental Protection Strategies in Industry • Cleaner Production: Definition, Core Principles, and Main Assumptions • Best Available Techniques (BAT): Definition, Core Principles, and Main Assumptions • Physical Methods of Wastewater Treatment Objectives, Techniques, and Efficiency • Chemical Methods of Wastewater Treatment Objectives, Techniques, and Efficiency (Coagulation, Flocculation, Advanced Oxidation of Contaminants) • Biological Methods of Wastewater Treatment Aerobic and Anaerobic Processes	
Practical activites within the subject	Not applicable	

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