



## Subject card

Subject name and code	, PG_00035495						
Field of study	Engineering and Technologies of Energy Carriers						
Date of commencement of studies	February 2022		Academic year of realisation of subject		2022/2023		
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		4.0		
Learning profile	practical profile		Assessment form		assessment		
Conducting unit	Department of Chemical and Process Engineering -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor						
	Teachers						
Lesson types and methods of instruction	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		4.0		36.0	100
Subject objectives	Presentation of issues related to environmental impact assessment and related legal aspects as well as selected topics of environmental protection in relation to industry - in the field of applied technologies for environmental protection, monitoring of pollutant emissions.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K7_U01	is able to plan and carry out experiments, interpret obtained results and draw conclusions, is also able to formulate and test hypotheses related to engineering problems and simple research problems in the field of chemistry, physics and engineering and chemical technology	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	K7_U05	is able to apply a system approach, including non-technical aspects, when formulating and solving complex engineering tasks, including atypical tasks as well as simple research problems	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	K7_U08	is able to design - in accordance with a given specification, taking into account non-technical aspects - a complex technological process related to engineering and energy media technologies, and implement this project, at least in part, using appropriate methods, techniques and tools, adapting existing or developing new ones for this purpose methods, techniques and tools	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	K7_W11	knows and understands the basic processes occurring in apparatus for technological processes and auxiliary devices, knows and understands in an in-depth degree - selected processes and unit operations and their methods and theories describing complex relationships between them, providing advanced general knowledge in the field of chemistry, mathematics, physics, engineering and chemical technology that form theoretical foundations, structured and theoretically founded knowledge covering key issues and selected issues in the field of advanced detailed knowledge concerning the production and processing of energy carriers, knows and understands the main development trends in this area	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
Subject contents	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		
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
	Rating from the laboratory	60.0%	40.0%
	Written test	60.0%	60.0%

Recommended reading	Basic literature	<p>Legal acts related to environmental protection</p> <p>C. Christ (ed.), Production-integrated environmental protection and waste management in the chemical industry, WILEY-VCH, 1999</p> <p>J.A. Tomaszek, P. Koszelnik, Progress in environmental engineering, CRC press, 2015</p> <p>Standard ISO 14001</p>
	Supplementary literature	<p>Reports of environmental impact assesment.</p> <p>Environmental reports.</p> <p>Scientific publications related to the subject.</p>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	