



Subject card

Subject name and code	Environmental Protection, PG_00039776						
Field of study	Materials Engineering, Materials Engineering, Materials Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2021/2022		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study		
Mode of study	Full-time studies	Mode of delivery			blended-learning		
Year of study	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Process Engineering and Chemical Technology -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Anna Zielińska-Jurek					
	Teachers	prof. dr hab. inż. Anna Zielińska-Jurek					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	E-learning hours included: 14.0						
	Address on the e-learning platform: <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19156">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19156</a> Adresy na platformie eNauczanie: Ochrona Środowiska - Moodle ID: 19327 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19327">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19327</a> Ochrona Środowiska - Moodle ID: 19327 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19327">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19327</a> Ochrona Środowiska - Moodle ID: 19327 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19327">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19327</a>						
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	15	12.0	23.0	50		
Subject objectives	Basic knowledge of environmental pollutant of water treatment technology, wastewater, air purification.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_K01	Student is able to define basic concepts in the field of environmental protection, search for information on the toxicity of substances and their impact on living organisms.			[SK5] Assessment of ability to solve problems that arise in practice		
	K6_W09	Student classifies types and sources impurities Describes the types of toxicity and methods of absorption of poisons			[SW1] Assessment of factual knowledge		
	K6_U03	Describes the basic technologies used for air treatment, water and wastewater. Describes industrial ecosystems			[SU1] Assessment of task fulfilment		
Subject contents	Ecotoxicology - history and basic concepts. Circuit nitrogen and carbon in nature. Homeostasis. Impact industrial processes on the environment Classification and sources of pollution. Circuit pollutants in nature. Toxicity and methods of absorbing poisons. Characteristics of contaminants: pesticides, dioxins, metals heavy, radioactive elements, and oil derivatives. The impact of anthropogenic substances environment: eutrophication, the greenhouse effect. Environmental protection law in the legal system of the Republic of Poland. Protection environment under international law. Environmental management systems: EMAS, ISO 14000. Life cycle analysis. Technologies of water for food and industrial applications. technologies wastewater treatment. Sludge management. Air purification technologies. ecosystems Industrial. A model industrial ecosystem in Kalundborgu. Principles of Green Engineering.						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	exam		60.0%
Recommended reading	Basic literature	1. vanLoon G.W., Duffy S.J., Chemia Środowiska, PWN, Warszawa 2008 2. Mering L. Prawo ochrony środowiskaLEX 1998, Wydanie II	
	Supplementary literature	1. Matlack A.S., Introduction to green chemistry, Marcel Dekker, Inc. 2001 2. Łomotowski J., Szpindor A. Nowoczesne systemy oczyszczania ścieków, ARKADY 1999 3. Kowal A.L., Świdorska-Bróż M., Oczyszczanie wody, PWN 1998	
	eResources addresses	Ochrona Środowiska - Moodle ID: 19327 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19327">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19327</a> Ochrona Środowiska - Moodle ID: 8385 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=8385">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=8385</a> Ochrona Środowiska - Moodle ID: 19156 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19156">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19156</a>	
Example issues/ example questions/ tasks being completed	1. The example of selected ecological disaster ohms emissions of mercury to the environment 2. Discuss the source of radioactive waste 3. Discuss Global Warming (causes, possible consequences of global warming) 4. Explain the mechanism of formation and the impact of acid rain on the environment 5. Describe what was the Biosphere 2 project 6. Discuss the ecosystem model as an example ekosystemu industrial Kalundborgu 7. Describe three selected principles of green engineering		
Work placement	Not applicable		

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