



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		dr hab. inż. Anna Zielińska-Jurek				
	Teachers		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: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19156 Adresy na platformie eNauczanie: Ochrona Środowiska - Moodle ID: 19327 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19327 Ochrona Środowiska - Moodle ID: 19327 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19327 Ochrona Środowiska - Moodle ID: 19327 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19327						
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, metalsheavy, 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. technologieswastewater treatment. Sludge management. Air purification technologies. ecosystemsIndustrial. 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%	100.0%
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 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19327 Ochrona Środowiska - Moodle ID: 19327 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19327 Ochrona Środowiska - Moodle ID: 19327 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19327	
Example issues/ example questions/ tasks being completed	1. The example of selected ecological disaster ohms emissions of mercury to the environment2. Discuss the source of radioactive waste3. Discuss Global Warming (causes, possible consequences of global warming)4. Explain the mechanism of formation and the impact of acid rain on the environment5. Describe what was the Biosphere 2 project6. Discuss the ecosystem model as an example ekosystemu industrial Kalundborgu7. Describe three selected principles of green engineering		
Work placement	Not applicable		