



Subject card

Subject name and code	Protection of the atmosphere and the climate, PG_00061704						
Field of study	Recycling and Energy Recovery						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2024/2025		
Education level	first-cycle 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	2		ECTS credits		1.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Environmental Engineering Technology -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Magda Kasprzyk				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	10.0	10.0	0.0	0.0	0.0	20
	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	20		1.0		4.0	25
Subject objectives	The aim of the course is to provide an introduction to the principles of atmospheric protection, emissions and the challenges posed by climate change.						
Learning outcomes	Course outcome	Subject outcome		Method of verification			
	[K6_U02] solves engineering issues and problems in the area of raw materials and energy recovery through the use of appropriate analytical, numerical and experimental tools and methods.	The student solves engineering issues and problems in the area of resource and energy recovery by applying appropriate and relevant analytical, numerical and experimental tools and methods.		[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information			
	[K6_K03] is committed to independent lifelong learning and independently follows the development of science and technology, especially in the area of recycling raw materials and energy.	The student engages in independent lifelong learning and independently follows developments in science and technology, especially in the area of resource and energy recovery.		[SK2] Assessment of progress of work [SK4] Assessment of communication skills, including language correctness			
	[K6_W02] analyzes engineering and technological issues and problems in the area of raw materials and energy recovery using appropriate and appropriate analytical, numerical and experimental tools and methods	The student analyses engineering and technological issues and problems in the area of resource and energy recovery using appropriate and relevant analytical, numerical and experimental tools and methods.		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects			
Subject contents	1. The atmosphere (composition and properties of the air, vertical structure of the atmosphere). Types, causes and sources of atmospheric air pollution. Human activity as a source of greenhouse gas emissions. 2.State of air quality in Poland and Europe. 3.Changes in climate of anthropogenic origin. 4.Main effects of climate change. Negative impact on the ocean. 5.Climate extremes and the effects on humans.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria	Passing threshold		Percentage of the final grade			
		60.0%		50.0%			
		60.0%		50.0%			

Recommended reading	Basic literature	<p>1.IPCC, 2021: Podsumowanie dla Decydentów. W: Zmiana Klimatu 2021: Fizyczne Podstawy Naukowe. Wkład I Grupy Roboczej do Szóstego Raportu Oceny Międzyrządowego Zespołu ds. Zmiany Klimatu. [V. Masson-Delmotte, i in. (red.)]. Cambridge University Press.</p> <p>2.Klimatyczne ABC. Podręcznik o zmianach klimatu dla każdego. REDAKCJA NAUKOWA M. Budziszewska, A. Kardaś, Z. Bohdanowicz. Wydawnictwo Uniwersytetu Warszawskiego</p> <p>3.Nauka o Klimacie. A. Kardaś, Sz. Malinowski, M.Popkiewicz. Wydawnictwo: Post Factum, 2018</p> <p>4.P. Stepnowski, E. Synak, B. Szafranek, Z. Kaczyński, Monitoring i analityka zanieczyszczeń środowiska, Uniwersytet Gdański 2010. https://chemia.ug.edu.pl/sites/default/files/nodes/strona-chemia/33539/files/monitoring.pdf</p>
	Supplementary literature	<p>5.Nature-based Solutions for Microclimate Regulation and Air Quality. European Commission B-1049 Brussels 2020</p> <p>6.Air quality Pollution sources and impacts, EU legislation and international agreements. European Parliament 2018.</p> <p>7.Research Findings in support of the EU. Air Quality Review. European Commission B-1049 Brussels 2013.</p> <p>8.L. Falkowska , K. Korzeniewski, Chemia atmosfery, Wydawnictwo Uniwersytetu Gdańskiego, 1998.</p> <p>9.M. Szklarczyk, Ochrona atmosfery, Wydaw. Uniwersytetu Warmińsko-Mazurskiego, 2001.</p> <p>10.pod red. K. Judy-Rezler i B. Toczko, Pyły drobne w atmosferze Kompendium wiedzy o zanieczyszczeniu powietrza pyłem zawieszonym w Polsce, Biblioteka Monitoringu Środowiska, Warszawa 2016. http://www.gios.gov.pl/images/aktualnosci/Pyly_drobne_w_atmosferze.Kompendium_wiedzy.pdf</p> <p>11.K. Judy-Rezler, Oddziaływanie zanieczyszczeń powietrza na środowisko, Oficyna wydawnicza PW, Warszawa 2016.</p> <p>12.G.W. van Loon, S.J. Duffy, Chemia Środowiska, Wydawnictwo Naukowe PWN, Warszawa 2007</p> <p>13.R.G. Griffin, Principles of air quality management, Taylor &Francis group: Boca Raton, 2007.</p> <p>14.Lewandowska A., L. Falkowska, Aerozole i gazy w atmosferze ziemskiej zmiany globalne, Wydawnictwo UG, Gdańsk 2009.</p>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Explanation of terms and differences: emission, immission, dry deposition, wet deposition, classical smog, photochemical smog.The additional greenhouse effect.Sources of carbon and how it circulates in nature.Radiative forcing, feedback.Adaptation and mitigation of climate change.	
Work placement	Not applicable	