



Subject card

Subject name and code	The impact of the electric power industry on the environment, PG_00057333						
Field of study	Power Engineering, Power Engineering, Power Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group			Optional subject group 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			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marcin Jaskólski					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	0.0	30
	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	30		6.0		14.0	50
Subject objectives	The aim of this course is to transfer the knowledge of identification of the impact of energy systems on the environment. Except for the impact of conventional energy sources, mostly coal-based, the effects of renewable energy sources, nuclear power as well as biogas- and natural gas-based technologies are within the scope of the course. In addition, selected methods and technologies of ash removal, flue gas desulphurization and carbon capture and storage (CCS) will be discussed.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_U01] is able to acquire information from literature, databases and other sources, has the ability of self-education in order to improve his/her professional competence (also in English), is able to prepare a simple scientific paper and its summary in English, as well as an oral presentation	They can use sources in different languages to prepare for a presentation on a given topic and a final test.			[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU5] Assessment of ability to present the results of task		
	[K7_W07] knows the environmental effects of energy technologies used; is familiar with the issues of effective energy management and use of renewable energy sources, has a broad and well-established knowledge of the processes of energy production and use	They know the environmental impact of energy technologies used.			[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation		
	[K7_W10] knows the basic installations of advanced energy systems, transmission networks and internal installations and their impact on the environment	They know basic energy systems and their impact on the environment.			[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation		
	[K7_W71] has general knowledge in humanistic, social, economic or legal sciences, including their fundamentals and applications	They have general knowledge of the application of environmental protection measures in the energy sector.			[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation		
	[K7_K05] is aware of the impact of engineering activities on the environment	They are aware of the impact of energy facilities on the environment.			[SK4] Assessment of communication skills, including language correctness		

Subject contents	The impact of power plants and CHP plants on natural environment - overview. Polish energy system - fuel mix. Land protection - the area occupied by power plants and power stations. Emissions and air protection. Ash removal - electrostatic precipitator (ESP). Flue gas desulphurisation. CO2 sequestration - carbon capture and storage (CCS) systems. The impact of nuclear power plants on the environment. The use of renewable energy sources and their environmental impacts. Biogas plants. Natural-gas-based systems and extraction of gas from unconventional sources - environmental effects.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Evaluation test	60.0%	50.0%
	Oral presentation - Seminar	60.0%	50.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Kucowski, Laudyn, Przekwas, Energetyka a ochrona środowiska, WNT, Warszawa 1997. 2. Pawlik, Strzelczyk, Elektrownie, WNT, Warszawa 2012. 3. Marecki: Podstawy przemian energetycznych, WNT, Warszawa 2004. 	
	Supplementary literature	<ol style="list-style-type: none"> 1. Strupczewski, Nie bójmy się energetyki jądrowej, SEREN, Warszawa, 2010. 2. Barre, Wszystko o energetyce jądrowej, AREVA, 2011. 	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<p>Discuss the methods of flue gas desulphurisation. What method is the least-cost solution, and which one is the best in terms of the effectiveness of desulphurisation?</p> <p>What is the principal rule of electrostatic precipitator?</p> <p>What area is occupied by power plant per 1 MW of installed capacity?</p>		
Work placement	Not applicable		