



Subject card

Subject name and code	The impact of the electric power industry on the environment, PG_00064764						
Field of study	Power Engineering						
Date of commencement of studies	February 2025	Academic year of realisation of subject			2025/2026		
Education level	second-cycle studies	Subject group			Specialty 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_U04] creatively designs or modifies, either entirely or at least in part, energy systems, machines and devices, transmission grids and internal installations, considering both technical and non-technical aspects, estimating costs and utilizing design techniques appropriate for tasks within the scope of Power Engineering	Performs a calculation task, taking into account the impact of the power sector on the environment.			[SU1] Assessment of task fulfilment		
	[K7_W11] interprets social, economic, legal (including industrial and intellectual property laws), and other non-technical aspects of engineering activities, and includes them into engineering practice	Interprets the environmental conditions of the power sector.			[SW1] Assessment of factual knowledge		
	[K7_K11] is aware of importance of professional acting, the need for critical verification of acquired knowledge and consulting experts opinion in case of facing difficulties with individual problem solving	Checks the correctness of own calculations based on the knowledge gained.			[SK5] Assessment of ability to solve problems that arise in practice		
[K7_U11] communicates and justifies opinions on specialized topics in a manner understandable to diverse audiences, including the use of modern techniques, including information technology	Performs the development of the task in a way that is understandable to recipients with various needs.			[SU5] Assessment of ability to present the results of task			

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"> <li>1. Kucowski, Laudyn, Przekwas, Energetyka a ochrona środowiska, WNT, Warszawa 1997.</li> <li>2. Pawlik, Strzelczyk, Elektrownie, WNT, Warszawa 2012.</li> <li>3. Marecki: Podstawy przemian energetycznych, WNT, Warszawa 2004.</li> <li>4. Zieliński A. (red.): Elektrownie jądrowe w nowoczesnej gospodarce, Wydawnictwo Naukowe PWN, Warszawa 2024</li> <li>5. Ewa Klugmann-Radziemska. <i>Energetyka i ochrona środowiska: Generowanie i magazynowanie energii. Odpady energetyczne. Analiza cyklu życia</i>. 1. wyd. Wydawnictwo Naukowe PWN, 2023. Print.</li> </ol>	
	Supplementary literature	<ol style="list-style-type: none"> <li>1. Strupczewski, Nie bójmy się energetyki jądrowej, SEREN, Warszawa, 2010.</li> <li>2. Barre, Wszystko o energetyce jądrowej, AREVA, 2011.</li> </ol>	
	eResources addresses	Adresy na platformie eNauczanie:	
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		

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