



Subject card

Subject name and code	Local and Ecological Electric Power Stations with internal Combustion Engines, PG_00042174						
Field of study	Power Engineering, Power Engineering, Power Engineering, Power Engineering, Power Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2023/2024		
Education level	first-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	4	Language of instruction			Polish		
Semester of study	7	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jacek Kropiwnicki					
	Teachers	dr hab. inż. Jacek Kropiwnicki					
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: 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	15	2.0		33.0		50
Subject objectives	Familiarize students with the operating characteristics of local thermal power plants with internal combustion engines and the elements of basic systems of power plant systems.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_W12	Student has knowledge of development trends in the field of construction and operation of local cogeneration power plants and non-technical aspects, including economical operation of these devices.			[SW1] Assessment of factual knowledge		
	K6_U08	Can use knowledge in the field of equipment used in local cogeneration power plants for the preliminary design of modern energy installations and analysis of its operation.			[SU2] Assessment of ability to analyse information		
	K6_W13	Student knows the basic installation of local cogeneration power plants and the impact of devices on the environment.			[SW1] Assessment of factual knowledge		
Subject contents	The national energy system and the role of distributed energy. Characteristics of local energy systems. Energy market and the role of distributed energy in the domestic energy market. Production and sale of energy in market conditions, considerations law relating to the operation of power systems. The use of emission limits CO ₂ . The theoretical basis for the rational use of machinery and equipment, indicators characterizing the operating conditions of the CHP. Average annual efficiency energy of the system. Optimization of the energy system - the criteria and methods achieving the objectives of optimization. Characteristics of the basic systems of power plants with internal combustion engines.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Test	50.0%			100.0%		

Recommended reading	Basic literature	<p>1. Gładys H., Matla R.: Praca elektrowni w systemie elektroenergetycznym. WNT. Warszawa.</p> <p>2. Legutko S.: Eksploatacja maszyn. Wydawnictwo Politechniki Poznańskiej. Poznań.</p> <p>3. Skorek J., Kalina J.: Gazowe układy kogeneracyjne. Wydawnictwa Naukowo-Techniczne.</p> <p>4. Skorek J.: Ocena efektywności energetycznej i ekonomicznej gazowych układów kogeneracyjnych małej mocy" Wydawnictwo Politechniki Śląskiej. Gliwice.</p> <p>5. Szargut J., Ziębik A.: Skojarzone wytwarzanie ciepła i elektryczności elektrociepłownie. Wydawnictwo Pracowni Komputerowej Jacka Skalmierskiego.</p>
	Supplementary literature	<p>1. http://www.cire.pl/</p> <p>2. http://www.tge.pl</p> <p>3. http://www.ure.gov.pl/</p>
	eResources addresses	<p>Adresy na platformie eNauczenie:</p> <p>Lokalne ekologiczne elektrociepłownie z silnikami spalinowymi, Energetyka, I st. - Moodle ID: 33889 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=33889</p>
Example issues/ example questions/ tasks being completed	<p>1. Make a selection of cogeneration modules with internal combustion engines fueled with natural gas.</p> <p>2. Determine the cash flow of a local combined heat and power plant with internal combustion engines.</p> <p>3. Sketch a diagram of the cooling system for cylinder liners and heads of a local power plant with internal combustion engines.</p>	
Work placement	Not applicable	