

GDAŃSK UNIVERSITY

Subject card

Subject name and code	Conventional Power Plants, PG_00051407								
Field of study	Electrical Engineering								
Date of commencement of studies	October 2021		Academic year of realisation of subject			2023/2024			
Education level	first-cycle studies		Subject group						
Mode of study	Full-time studies		Mode of delivery			at the university			
Year of study	3		Language of instruction			Polish			
Semester of study	6		ECTS credits			4.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Department of Electr	Pepartment of Electrical Power Engineering -> Faculty of Electrical and Control Engineering							
Name and surname of lecturer (lecturers)	Subject supervisor dr inż. Marcin Jaskólski								
	Teachers		dr inż. Wiktoria Stahl						
		dr inż. Tomasz Minkiewicz							
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	:t	Seminar	SUM	
of instruction	Number of study hours	30.0	15.0	0.0	0.0		15.0	60	
	E-learning hours included: 0.0								
	Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=481								
Learning activity and number of study hours	Learning activity Participation ir classes include plan		I didactic Participation in ed in study consultation hours		Self-study SUM				
	Number of study hours	60		5.0		35.0		100	
Subject objectives	The aim of the course is to familiarize with the technological sequence in conventional power plants and combined heat and power plants, and to acquire the ability to perform calculations of thermodynamic cycles for these objects, as well as calculating the power and energy produced in coal, gas, nuclear and hydro power plants.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	K6_U09		Students are able to determine the electrical power of a conventional power plant based on given parameters.			[SU1] Assessment of task fulfilment			
	K6_W10		Students know the basics of energy transformations.			[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation			
	K6_K05		Students know the basic risk factors occurring in various types of energy sources.			[SK4] Assessment of communication skills, including language correctness			
	К6_К01		Students understand the need to explore knowledge in the field of conventional power plants.			[SK3] Assessment of ability to organize work [SK4] Assessment of communication skills, including language correctness [SK2] Assessment of progress of work			

Prerequisites and correquisites Subject passing criteria Passing threshold Percentage of the final grade 40.0% Assessment methods and criteria Est 60.0% 40.0% 40.0% Recommended reading Basic literature Marecki J.: Podstawy przemian energetycznych, WNT, Warszawa 2007 Recommended reading Basic literature Marecki J.: Podstawy przemian energetycznych, WNT, Warszawa 2008, Bartnik R.: Elektrownie i elektrocieptownie gazowe, WNT, Warszawa 2008, Bartnik R.: Elektrownie i elektrocieptownie gazowe, WNT, Warszawa 2012 Supplementary literature Clealifieki J., Grudziński D., Jasiński W., Pudik W.: Termodynamika Zdania i przykłady obliczeniowe, Wyd. Politechniki Gdańskie, Gdańsk 2008 Gora S., Kopecki K., Marecki J., Pochyluk R.: Zbior zadań z gospodarki energetycznej, WNT, Pacnań 1976 Wiler A., Pawlicki K., Szolc T.: Maszynoznawstwo. Podręcznik dla Technikum, WSP, Warszawa 2012 Marecki J.: Gospodarka skojarzona ciepino-elektryczna, WNT, Warszawa 1980 eResources addresses Adresy na platformie eNauczanie: ELEKTROWNIE KONWENCJONALNE [2023/24] - Moodle ID: 32423 tasks being completed 1. Draw a simplified diagram of the steam power plant working in the Hirma cycle. Present the circuit in the T- sand is system. 2. Describe the specific steam consumption, specific heat consumption and specific conventional fuel consumption by mathematical relationships. 3. Steaw the regenerative heatang	Subject contents	Energy forms and carriers as well as energy transformations. Basic physical quantities characterizing steam and water as a working factor in thermal circuits of conventional power plants. Thermodynamic changes. Enthalpy-entropy (i-s) and temperature-entropy (T-s) plots for steam and water. Theoretical Carnot circulation - circulation efficiency. Steam thermal power plants. Rankine cycle. Theoretical and real efficiency of the Rankine cycle. Determining the operational indicators of the power plant block. Means used to improve the efficiency of the Rankine cycle. Associated thermo-electric economy. Energy balance of the combined heat and power plant block. Gas and gas-steam power plants. Brayton-Joule cycle. Theoretical and real efficiency of the Brayton-Joule cycle. Measures to improve the efficiency of the Brayton-Joule cycle. Calculation of gross and net power of gas and gas-steam power unit. Nuclear power plants. Attitudes of energy transformations in nuclear power plants. Criticality of the nuclear reactor. Calculation of gross and net nuclear power. Comparison of thermal circuits in coal and nuclear power plants. Large hydropower plants. Calculation of power and energy in hydropower plants.							
Subject passing criteria Passing threshold Percentage of the final grade Test 60.0% 40.0% 20.0% Seminar presentation 60.0% 40.0% 20.0% Recommended reading Basic literature Marecki J: Podstawy przemian energetycznych, WNT, Warszawa 2007 Chmielniak T:: Technologie energetyczne, WNT, Warszawa 2008, Bartnik R:: Elektrownie i elektrociepiownie gazowe, WNT, Warszawa 2008, Supplementary literature Casina i przykłady obliczeniowe, WNT, Warszawa 2012 Clesilński D., Jasiński W., Pudlik W.: Termodynamika, Zadania i przykłady obliczeniowe, Wyd. Politechniki Gdańskie, Gdańsk 2008 Supplementary literature Ciesilński J., Grudziński D., Jasiński W., Pudlik W.: Termodynamika, Zadania i przykłady obliczeniow, Wyd. Politechniki Gdańskie, Gdańsk 2008 Góra S., Kopecki K., Marecki J., Bochyluk R.: Zbiór zadań z gospodarki energetycznej, WNT, Poznań 1976 Kijewski J., Miler A., Pawlicki K., Szolc T.: Maszynoznawstwo. Podręcznik dla Technikum, WSIP, Warszawa 2012 Warszawa 1980 Reesources addresses Adresy na platformie enauczanie: ELEKTROWNIE i sieci cieplne, PWN, Warszawa 1963 eResources addresses Adresy na platformie enauczanie: ELEKTROWNIE KONWENCJOANLNE [2023/24] - Moodie ID: 32423 tasks being completed 1. Draw a simplified diagram of the steam consumption, specific heat consumption and specific conventional fuel consumption by mathematical	Prerequisites and co-requisites								
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Work placement Not applicable	Work placement	Not applicable							