

## 表 GDAŃSK UNIVERSITY OF TECHNOLOGY

## Subject card

Subject name and code	, PG_00058639							
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					
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		3.0			
Learning profile	general academic profile		Assessmer	ssessment 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	t	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0		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		0.0		0.0		30
Subject objectives	The purpose of the course is to provide general information about modern energy sources.							

Learning outcomes	Course outcome	Subject outcome	Method of verification			
	[K7_W02] has extended and deepened knowledge of physics, chemistry, thermodynamics, fluid mechanics, material science, necessary to understand and describe basic thermal and flow phenomena occurring in and around power equipment and systems, transmission networks and internal installations	they have extended and in-depth knowledge in the field of physics and thermodynamics, necessary to understand the description of phenomena occurring in energy systems.	[SW1] Assessment of factual knowledge			
	[K7_K71] is able to explain the need to apply knowledge from humanistic, social, economic or legal sciences in order to function in a social environment	They can explain the need to use knowledge in the field of economic and legal sciences in relation to energy systems.	[SK4] Assessment of communication skills, including language correctness			
	[K7_U71] is able to apply knowledge from humanistic, social, economic or legal sciences in order to solve problems	They can apply knowledge in the field of humanities, social, economic or legal sciences to assess the prospects for the development of energy technologies.	[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_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 various languages to improve knowledge in the field of modern energy technologies.	[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_K02] is able to work in a group and take on different roles	They can work in teams.	[SK1] Assessment of group work skills			
	[K7_W08] as knowledge about development trends in the field of known technologies and non- technical aspects to solve simple engineering tasks in the field of power systems and equipment or transmission networks and internal installations	they have knowledge of development trends in the field of learned technologies and is able to solve simple engineering tasks in the field of energy generation technology.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects			
Subject contents	General data concerning the large part and importance of new energy sources for national power system. Different kinds of the sources especially the planed energy sources in Poland. Balancing principles of energy objects on the examples of: conventional steam power plants, especially the ultra supercritical plants and also these which are equiped with the hybrid systems with coal gasification and the boilers with fluidised bed combustion chamber and also with combined gas and steam blocks. Nuclear power stations with reactors of the latest generation. Small hybrid systems with biomass-fired plants, wind plants, solar stations and installations equiped with fuel cells. Small combined heat and power systems based on Dieselengine-sets plants or gas turbine plants. Solutions of plants based on different kinds of nonconventional energy sources (geothermal, sea and ocean water energy, stations with MHD-generators). Calculations of technical and operating coefficients of above-mentioned sources. Importance of environmental protection problems.					
Prerequisites and co-requisites						
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade			
and criteria	Knowledge test	60.0%	100.0%			
Recommended reading	Basic literature	Kubowski J.: <i>Nowoczesne elektrownie jądrowe</i> . WNT, Warszawa 2010 Pawlik M., Strzelczyk F.: <i>Elektrownie</i> . WNT, Warszawa 2009 Chmielniak T.: <i>Technologie energetyczne</i> . WNT, Warszawa 2008				

	Supplementary literature	Praca zbiorowa: <i>Poradnik inżyniera elektryka. Tom III.</i> WNT, Warszawa 2007 Cieśliński J., Mikielewicz J.: <i>Niekonwencjonalne źródła energii.</i> Wydawnictwo Politechniki Gdańskiej, Gdańsk 1996 Szargut J., Ziębik A.: <i>Podstawy energetyki cieplnej.</i> WNP, Warszawa 2000 Lewandowski W.: <i>Proekologiczne odnawialne źródła energii.</i> WNT, Warszawa 2007.			
	eResources addresses	Adresy na platformie eNauczanie:			
Example issues/ example questions/ tasks being completed	What moisture content is accepted in steam turbine? What might be the effect of too low steam quality? Show feedwater heating on an h-s graph and a schematic diagram of turbine system. What is the role of mixing system in a biogas plant? What are the advantages and disadvantages of fuel cells?				
Work placement	Not applicable				