GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Modern thermal power plants and polygeneration, PG_00055945		
Field of study	Power Engineering, Power Engineering, Power Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2024/2025
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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division Of Fluid-Flow Machinery -> Institute Of Energy -> Faculty Of Mechanical Engineering And Ship Technology -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marian Piwowarski	
	Teachers	dr hab. inż. Marian Piwowarski prof. dr hab. inż. Krzysztof Kosowski dr inż. Wojciech Włodarski	

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	15.0	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	2.0	18.0	50

Subject objectives	Knowledge of modern, advanced power plants for electric power stations and distributed systems of energy

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U06] is able to use the basic knowledge on the operation of energy equipment in the field of thermal power plants, thermal and energy and heating systems, combustion engines, compressors and rotating machines to assess the technical condition of the system	Students know the main characteristic parameters of the operation of power plants.	[SU3] Assessment of ability to use knowledge gained from the subject
[K6_W06] knows classic and developmental energy technologies, rules for the selection and operation of heat and energy devices and installations, basic principles of energy systems operation, basic issues regarding the reliability of energy devices and diagnostics, environmental effects of energy technologies used, methods of using renewable energy sources	Students can: - perform preliminary design calculations of large output power plants and distributed energy systems, - describe modern power plants	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[K6_W13] has basic knowledge of the operation of energy equipment in the field of thermal power plants, thermal and energy and heating systems, internal combustion engines, compressors and rotating machines, has basic knowledge of the regulation of energy equipment and methods of their selection depending on the needs	Students know the main principles of operation of power plants	[SW1] Assessment of factual knowledge

Subject contents

Modern steam turbine power plants with advanced supercritical parameters.

Modern gas turbines units of high efficiency.

Combined gas-steam power plants.

Nuclear power plants with reactors of III+ and IV generations.

Hydrogen power plants.

Energy "harvesting" and "scavenging".

Power plants for distributed energy systems.

Energy storage systems.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
test	60.0%	100.0%

Recommended reading

Basic literature	1. S. Perycz, "Turbiny parowe i gazowe" (Polish) ("Steam and gas turbines), Ossolineum, 2. K. Kosowski, "Steam and gas turbines. With examples of Alstom technology", 2007
Supplementary literature	1. Contemporary books, journal articles and conference papers
eResources addresses	Adresy na platformie eNauczanie: Współczesne siłownie cieplne i poligeneracja - Moodle ID: 44294 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44294

Example issues/ example questions/ tasks being completed	Schema and parameters of advanced supercritical steam power plants. Parameters and design of high efficient gas turbine units. Examples of hydrogen power plants Examples of "energy harvesting and scavenging". Energy storage systems.
Work placement	Not applicable

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