GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Technology and Energy Conversion Machines, PG_00042073		
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	2022/2023
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study 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	English
Semester of study	5	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Zbigniew Kneba	
	Teachers	dr hab. inż. Zbigniew Kneba	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	15.0	0.0	0.0	45

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	45	7.0	23.0	75

Subject objectives

The aim is to familiarize students with modern machines in the production and use of electricity, heat and compressed gas energy.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W06	He knows the constructions of reciprocating machines converting energy in the power industry. He can examine the basic parameters of machines' operation. He knows the methods of monitoring the work of reciprocating machines.	[SW1] Assessment of factual knowledge
K6_W04	Can calculate loads - forces and moments acting in reciprocating machines.	[SW1] Assessment of factual knowledge

Subject contents

Construction of high-power engines. Power plants with reciprocating engines. Gym installations. Monitoring of engine operating parameters in the power industry. Fuel systems of SI engines. Spark ignition systems. Diesel fuel storage injection. Unit injectors. Accumulative injection systems for high-power engines. Gas supply to engines. Energy recovery from exhaust heat. Ship power plants. Distributed energy sysstems. Hybrid drive systems.

Prerequisites and co-requisites

Thermodynamic changes, fuels, friction processes, heat exchange processes, theoretical mechanics.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
writen exam	50.0%	100.0%

Recommended reading

Basic literature	Combustion engines development Springer Verlag
Supplementary literature	Klimstra J., Hotakainen M.: Smart power generation
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

Draw a diagram of the utilization of thermal energy in a power plant with reciprocating engines.Outline a diagram of a dual-fuel diesel engine fueling with methane and natural gas.

Work placement

Not applicable