GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Energy Systems Stations (WOiO), PG_00042106		
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	
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	4	Language of instruction	English
Semester of study	7	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Roman Liberacki	
	Teachers	dr inż. Patrycja Puzdrowska dr inż. Roman Liberacki	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	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	5.0	65.0	100

Subject objectives

To acquaint the students with the construction and operation of energy systems, using as an example the ship power plant.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W06	The student knows how to select elements of different types of power systems. He knows the structure and principle of operation of devices included in power plants.	[SW1] Assessment of factual knowledge
K6_U05	The student is able to perform a heat balance of an internal combustion piston engine.	[SU1] Assessment of task fulfilment
K6_U01	The student is able to perform tasks on the ship power plant simulator.	[SU1] Assessment of task fulfilment

Subject contents

Internal combustion engines - principle of operation and classification. Heat balance of the engine. Uniform and combined propulsion systems.The main comonents of the propulsion system. Power plant efficiency and waste heat utilization. Cooling water system, lubricating oil system, fuel oil systeml, gaseos fuel system (LNG), compressed air system, exhaust gas system. Fittings and accessories of pipeline systems in the power plant. Layout of equipment in the ship power plant. Start, supervision during operation and shutdown of the propulsion system - using the simulator of ship power plant.

Prerequisites and co-requisites

Knowledge of the subject: thermodynamics.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Written test	50.0%	50.0%
Test on simulator	100.0%	50.0%

Recommended reading

Basic literature	1. Hans Klein Woud, Douwe Stapersma: Propulsion and Electric Power Generation systems. IMAREST 2002
Supplementary literature	No requirements.

	eResources addresses	Adresy na platformie eNauczanie: Energy Systems Stations, L, ET, sem.7, zima 23/24 (PG_00042106) - Moodle ID: 32397 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32397 Energy Systems Stations, L, ET, sem.7, zima 23/24 (PG_00042106) - Moodle ID: 32397 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32397
Example issues/ example questions/ tasks being completed	1. Give the formula for the brake thermal efficiency of the internal combustion piston engine. 2. Give the formula for the energy efficiency of the ship power plant and discuss the methods of improving the efficiency. 3. Make a start-up, control during operation, and set off the propulsion system on simulator.	
Work placement	Not applicable	