



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