



## Subject card

Subject name and code	Power Engineering Systems in Transport, PG_00056230						
Field of study	Transport and Logistics						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2024/2025		
Education level	first-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		5.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Zakład Wyposażenia Okrętu -> Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Konrad Marszałkowski				
	Teachers		dr inż. Konrad Marszałkowski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60
	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	60		10.0		55.0	125
Subject objectives	To familiarize students with energy sources, examples of energy systems found in transport and economic aspects related to the efficiency of energy devices and systems.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W08] has knowledge regarding the principles of sustainable development		The student lists renewable and non-renewable energy sources. The student gives examples of propulsion systems and methods of generating electricity and heat on ships. The student knows the relationships determining the efficiency of the device and the energy system.		[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		
	[K6_W03] has a basic knowledge on hydromechanics, thermodynamics, machine construction, ecology, materials science and electronics necessary to understand the construction and operation principles of means of marine transport		The student knows ways to reduce fuel consumption by energy devices and systems. The student is able to explain the influence of the transported cargo on the energy system of the vessel. The student is familiar with the issues of energy supply to ports.		[SW1] Assessment of factual knowledge		
	[K6_W04] has a basic knowledge in IT, electronics, automation and control, computer graphics useful to understand the possibilities of their application in transport		The student understands the impact of the efficiency of the energy system on the natural environment. The student understands the ecological advantages of using renewable energy sources. The student knows what redundancy in energy systems is.		[SW1] Assessment of factual knowledge		
Subject contents	Energy. Types of energy. Renewable and non-renewable energy sources. Energy system. Production of mechanical, electrical and thermal energy. Efficiency of the energy device and energy system. Ways to increase energy efficiency. Ship power plant as an example of an energy system. The influence of the type of cargo transported on the ship's energy system. Energy systems of ports and logistics centers. The impact of port infrastructure and logistics center on the energy system solution.						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		60.0%	40.0%
		60.0%	60.0%
Recommended reading	Basic literature	1.Urbański P.: Gospodarka energetyczna na statkach, Wyd. Morskie 1978  2.Woud H. K., Stapersma D.: Design of propulsion and electric power generation systems. IMarEST, London 2002  3.Kosowski K. Turbines for ship propulsion, wyd. PG, Delft University, Gdańsk 2005.	
	Supplementary literature	1. Wojnowski W.: Okrętowe siłownie spalinowe. Morski Instytut Rybacki. Gdynia 1991. Część I, II.	
	eResources addresses	Adresy na platformie eNauczanie: Systemy energetyczne w transporcie (PG_00056230), W, C, TiL, ZIMA 24/25 - Moodle ID: 41332 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=41332">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=41332</a>	
Example issues/ example questions/ tasks being completed	1. List renewable and non-renewable energy sources. 2. Determine the efficiency of a given energy system. 3. List the methods of generating electricity on a ship. 4. Provide the conditions for transportation and reloading of crude oil.		
Work placement	Not applicable		

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