GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Energy management in transportation systems, PG_00058654						
Field of study	Transport and Logistics						
Date of commencement of studies	February 2024		Academic year of realisation of subject	2024/2025			
Education level	second-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery	at the university			
Year of study	1		Language of instruction	Polish			
Semester of study	2		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 hab. inż. Damian Bocheński				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	30.0	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		0.0	0.0		60
Subject objectives	To acquaint the students with the technical, economic and environmental aspects of energy management in means of transport and in selected terrestrial infrastructure facilities associated with the transport industry.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U04] The student is able to use the known methods and mathematical models, as well as computer simulations to analyze, design and evaluate the functioning of transport systems or their components	Using the known methods, the student can determine the efficiency and estimate the cost of work of a complex energy system, can estimate the emission of pollutants	[SU4] Assessment of ability to use methods and tools
[K7_K02] The student is aware of the importance of non-technical aspects and the effects of engineering activities, including its impact on the natural environment and the related responsibility for decisions made	The student is focused on searching for energy-saving and pro-ecological solutions.	[SK5] Assessment of ability to solve problems that arise in practice
[K7_U06] The student is able to notice their non-technical aspects, including environmental, economic and legal aspects when formulating and solving project tasks. Applies the principles of occupational health and safety	The student is able to determine the efficiency and estimate the cost of work of a complex energy system. The student is able to estimate the emission of pollutants generated by the means of transport. The student is focused on searching for energy-saving and pro-ecological solutions.	[SU1] Assessment of task fulfilment
[K7_W02] The student has an extensive knowledge of modeling transport processes, including the knowledge necessary to describe and evaluate the functioning of selected elements of the transport system	The student has an organized knowledge of energy sources as well as economic and ecological values of their use. The student has structured knowledge in the field of building energy systems of means of transport and land infrastructure facilities. The student knows the principles of energy-saving operation of means of transport.	[SW1] Assessment of factual knowledge
[K7_U01] The student can obtain information from literature, databases and other, properly selected sources, also in English; is able to integrate the obtained information, interpret it, as well as draw conclusions and formulate and justify opinions	The student is able to obtain information from literature, databases and other, properly selected sources	[SU2] Assessment of ability to analyse information

Subject contents

Energy, energy conversion, efficiency of energy systems. Non-renewable energy sources in transport. Renewable energy sources in transport. Hydrogen and fuel cells, the other alternative sources of energy. Energy systems for means of water transport. Energy systems for means of land transport. Improving efficiency (recovery of waste heat). Improving efficiency (hybrid drive systems). Energy-efficient operation of means of transport. Land energy systems for transport needs. Energy aspects of operation of transfer systems and means of internal transport. Designing oriented towards energy efficiency. Energy management and environmental protection.

Prerequisites and co-requisites

No requirements.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Project	51.0%	50.0%
test	60.0%	50.0%

Recommended reading

Basic literature	1.Urbański P.: Gospodarka energetyczna na statkach, Wyd. Morskie. Gdańsk, 1978
Supplementary literature	No recommendations.
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

Work placement

Not applicable