



## Subject card

Subject name and code	, PG_00058654						
Field of study	Transport and Logistics						
Date of commencement of studies	February 2022	Academic year of realisation of subject			2022/2023		
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	Faculty of Ocean Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Damian Bocheński					
	Teachers	dr inż. Piotr Bzura dr hab. inż. Damian Bocheński					
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						
	Gospodarka energetyczna w systemach transportowych - Moodle ID: 25736 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25736">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25736</a> Gospodarka energetyczna w systemach transportowych,P,TiL,sem.02, zimowy 22/23 - Moodle ID: 26325 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26325">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26325</a>						
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_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_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_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%	100.0%
Recommended reading	Basic literature	1. Urbański P.: Gospodarka energetyczna na statkach, Wyd. Morskie. Gdańsk, 1978	
	Supplementary literature	No recommendations.	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		