GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Power Management in Transport, PG_00060654		
Field of study	Transport and Logistics		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2024/2025
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	4	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Division of Marine Power Plants -> Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Jacek Rudnicki	
	Teachers	dr inż. Jacek Rudnicki	

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	5.0	60.0	125

Subject objectives

Introducing students to issues related to energy sources, examples of energy systems encountered in transport and economic aspects related to the efficiency of energy equipment and systems.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_K03] understands non-technical aspects and effects of activity in the profession of an engineer and its impact on the environment; is aware of the responsibility for decisions made	Student is able to determine the influence of technical solutions applied in ship power system (e.g. type of main ship propulsion) on environmental risks.	[SK5] Assessment of ability to solve problems that arise in practice
[K6_U05] can formulate a simple engineering task and its specification in the field of design, maintenance and operation of transport means and systems	The student explains the functioning of the basic elements of the selected, technical energy system. It describes the cooperation of system elements based on operational characteristics. Uses quantitative indicators characterizing the power system.	[SU3] Assessment of ability to use knowledge gained from the subject
[K6_W04] has well established knowledge in the field of computer science, electronics, automation and control, information technology and computer graphics, useful for understanding the possibilities of applying them in transport	Student is able to use publicly available as well as specialized and dedicated web resources and software in the selection of criteria and comparative analysis of different types of power systems.	[SW1] Assessment of factual knowledge

Subject contents	Lecture: Energy. Types of energy. Renewable and non-renewable sources of energy. Classification of fuels. Energy system. Generation of mechanical, electrical and thermal energy. Efficiency of an energy device and energy system. Methods of improving energy efficiency. Ship power plant as an example of energy system. Influence of the type of cargo carried on the solution of the ship's power system. Basic issues of reliability and safety of selected power systems - classification monitoring. Diagnosis of the technical state of the system components. Auditorium exercises: Technical and economic comparative analysis of typical solutions of the selected energy system due to their configuration and type of fuel used with particular emphasis on the possibility of waste heat utilization. Operational characteristics of the energy system and its selected elements.
Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Written exam	51.0%	70.0%
Midterm colloquium	51.0%	30.0%

Recommended reading

Basic literature	Giernalczyk M., Górski Z.: Siłownie okrętowe. Cz. I, Gdynia 2011. Kaźmierczak J.: Eksploatacja systemów technicznych. Wyd. Politechniki Śląskiej, Gliwice 2000. Urbański P.: Gospodarka energetyczna na statkach, Wyd. Morskie 1978 Woud H. K., Stapersma D.: Design of propulsion and electric power generation systems. IMarEST, London 2002
Supplementary literature	Przepisy klasyfikacji i budowy statków morskich PRS, DNV.
eResources addresses	Adresy na platformie eNauczanie: Energetyka w transporcie, W, C, semestr letni 24/25 - Moodle ID: 43739 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=43739

Example issues/ example questions/ tasks being completed	1. List and make a comparative analysis of renewable and non-renewable energy sources. 2. Calculate the efficiency of a specified energy system. 3. List and describe ways to generate electricity on a ship. 4. Identify the rationale for the use of diesel-electric propulsion systems. 5. Methods of reducing NOx and SOx emissions.
Work placement	Not applicable

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