



Subject card

Subject name and code	, PG_00072652						
Field of study	Design and Construction of Yachts, Naval Architecture and Offshore Structures						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2026/2027		
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		Polish		
Semester of study	7		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Division of Marine Auxiliary Machinery -> Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Jacek Nakielski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	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	15		0.0		0.0	15
Subject objectives	To familiarize students with the over two-hundred-year history of the evolution of mechanical drives used in shipbuilding. To demonstrate the relationship between technological development, economic needs, and civilizational progress, with particular emphasis on energy transformations in maritime transport.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U71] is able to apply knowledge from humanistic, social, economic or legal sciences in order to solve problems		The student is able to justify the purposefulness of researching historical technological trends in mechanical and ship engineering in the context of contemporary challenges related to decarbonization and the ecology of shipping.		[SU2] Assessment of ability to analyse information		
	[K6_K71] is able to explain the need to apply knowledge from humanistic, social, economic or legal sciences in order to function in a social environment		The student has a structured historical knowledge of the key stages in the development of mechanical propulsion systems for vessels, from steam engines to nuclear and unconventional propulsion, and understands their impact on the economic history of the world.		[SK2] Assessment of progress of work		
	[K6_W71] has general knowledge in humanistic, social, economic or legal sciences, including their fundamentals and applications		The student is able to analyze and evaluate the technical, economic and social conditions that determined the transition from one type of drive to another over the last two centuries.		[SW2] Assessment of knowledge contained in presentation		
Subject contents	Course content – lecture 1. Introduction to the history of mechanical propulsion. The steam revolution and the decline of the sailing age. (2h) 2. The evolution of marine steam propulsion: from reciprocating engines to steam turbines. (3h) 3. The origins and dominance of internal combustion engines (piston and turbine) in commercial and military shipping. (3h) 4. The nuclear age at sea the history, development, and limitations of nuclear ship propulsion. (2h) 5. Unconventional concepts and the search for new solutions (e.g., magnetohydrodynamic propulsion). (2h) 6. Summary: Repeatability of technological cycles and the contemporary energy transformation in ship technology. (3h)						

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written final test	51.0%	100.0%
Recommended reading	Basic literature	Urbański P., Dwa wieki napędu mechanicznego, Wydawnictwo Morskie, Gdańsk	
	Supplementary literature	Piwoński J., Niezwykłe okręty, Instytut Wydawniczy "Nasza Księgarnia", Warszawa	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. Discuss the technical and social reasons why reciprocating steam drives were replaced by marine steam turbines in the early 20th century. 2. What factors prevented nuclear propulsion from finding widespread use in the civilian merchant fleet? 3. Explain the operating principle of magnetohydrodynamic propulsion and identify historical attempts at its implementation.		
Practical activities within the subject	Not applicable		

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