



Subject card

Subject name and code	Principles of hybrid propulsion for waterborne vehicles, PG_00064998						
Field of study	Napędy hybrydowe w transporcie wodnym						
Date of commencement of studies	February 2025		Academic year of realisation of subject		2025/2026		
Education level	second-cycle studies		Subject group		Specialty subject group 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	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		exam		
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. Magdalena Kunicka				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	30.0	0.0	45
	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	45		11.0		44.0	100
Subject objectives	To familiarize students with issues related to propulsion systems, especially hybrid and electric ones, currently used for transport in the shipbuilding industry.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U13] evaluates the feasibility and potential for utilizing new technical and technological achievements in accomplishing tasks characteristic for the field of study		Knowledge of the latest electric and hybrid ship propulsion solutions. Ability to pre-select propulsion components.		[SU5] Ocena umiejętności zaprezentowania wyników realizacji zadania [SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu		
	[K7_W12] identifies and interprets the main developmental trends and significant new achievements in the field of engineering and technical sciences and disciplines relevant to the course of study		Knowledge of current trends in watercraft propulsion systems.		[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym		
	[K7_U03] identifies and formulates task specifications in the scope of transport systems and processes design, including non-standard problems and taking into consideration their non-technical aspects		Knowledge of the basics of designing and selecting hybrid drive systems.		[SU4] Ocena umiejętności korzystania z metod i narzędzi		
Subject contents	Course content – lecture						
	1. History of hybrid propulsion systems in various industries. 2. National and international standards and regulations. 3. Basic types of propulsion systems/engines. 4. Energy conversion system. 5. Hybrid propulsions and their control systems. 6. Electric ships. Types of electric power supply for hybrid propulsion. 7. Basics of optimizing energy consumption by a unit with a hybrid propulsion.						

Prerequisites and co-requisites	Basic knowledge of electrical engineering and electronics. Basic knowledge of hydromechanics and general mechanics.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	60.0%	50.0%
	Lecture	60.0%	50.0%
Recommended reading	Basic literature	Electric motors and drives: Fundamentals, Types and Applications. Austin Huges, Bill Drury.	
	Supplementary literature	Design and control of hybrid power and propulsion systems for smart ships: A review of developments. R.D. GEERTSMA, R.R. NEGENBORN, K. VISSER, J.J. HOPMAN, Applied Energy, 2017.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. Calculating the energy requirement for a hybrid propulsion unit.2. Types of hybrid propulsions.3. Types of electric propulsions with a description of the components.		
Practical activities within the subject	Not applicable		

Document generated electronically. Does not require a seal or signature.