



Subject card

Subject name and code	Yacht Propulsion Systems, PG_00056263						
Field of study	Design and Construction of Yachts						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2024/2025		
Education level	first-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		2.0		
Learning profile	practical profile		Assessment form		assessment		
Conducting unit	Faculty of Ocean Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Jacek Rudnicki				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	5.0	10.0	0.0	30
	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	30		4.0		16.0	50
Subject objectives	Knowledge of the basic solutions of various propulsion systems, the ability to design a preliminary power plant based on similar motor ships.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W03		The student is able to determine the energy requirements for ship propulsion using preliminary design methods. He is able to pre-design the marine energy (propulsion) system of a motor yacht.		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	K6_K03		Student identifies the specifics of marine internal combustion engine operation and the impact of this process on the anthropotechnical environment.		[SK5] Assessment of ability to solve problems that arise in practice		
	K6_W05		Student is able to select main propulsion engine and auxiliary equipment according to specified evaluation criteria and classification regulations. He knows the principles of using the technical documentation of marine equipment to calculate the equipment of piping systems: cooling, fuel, lubricating oil, compressed air and exhaust gas		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	K6_W04		The student is able to use openly available as well as specialized and dedicated software to realize the preliminary design of the power system of a motor yacht.		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		

Subject contents	<p>LECTURE Classification of yachts, specifics of each class. Comparative analysis of propulsion systems used. Marine propulsors used on motor yachts. Selection of main propulsion engine for determined requirements and assumed criteria. Engine thermal balance. Calculation and selection of cooling, fuel, lubricating oil, compressed air and exhaust gas installation devices. Calculations and selection of piping diameters.</p> <p>DESIGN EXERCISES Approximate methods for determining the amount of energy required to propulsion a ship (motor yacht). Formulation of the criterion of engine selection. Procedure for calculating and performing calculations of engine heat balance components. Classification requirements for main propulsion engine protection systems in the regulations of classification societies. Calculation and catalog selection of cooling, fuel, lubricating oil, compressed air and exhaust system equipment. Calculations and selection of nominal diameters of pipelines. Preparing schematic diagrams of installations.</p> <p>LABORATORY EXERCISES Preparation for commissioning, starting and supervision during operation of a marine diesel engine</p>		
Prerequisites and co-requisites	Knowledge of thermodynamics, heat transfer and fluid mechanics		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Midterm colloquium	51.0%	70.0%
	Project	100.0%	30.0%
Recommended reading	Basic literature		<p>1.K. Zbierski: Dieslowe napędy jachtów. Wyd. Morskie Łódź 2012</p> <p>2.T.Bartlett: Diesel na jachcie. Wyd. Oficyna Wydawnicza Alma-Press, Warszawa 2010</p> <p>3.D.Gerr: Boat mechanical systems. Handbook. INTERNATIONAL MARINE</p>
	Supplementary literature		Basic Principles of Ship Propulsion. MAN Energy Solutions. www.man-es.com , Copenhagen, 2020.
	eResources addresses		Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. Classification and scope of application of marine thrusters. 2. Schematic of power and efficiency in a yacht power system, evaluation indicators. 3. Propulsion system components of a motor yacht - scheme and general characteristics. 4. Propeller - initial selection steps. 5. Main propulsion engines - types, characteristics, selection, structural and energy indices. 6. Engine and propeller operation during sailing in various conditions. 		
Work placement	Not applicable		