



## Subject card

Subject name and code	, PG_00062020						
Field of study	Mechanical and Naval Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2025/2026		
Education level	first-cycle studies		Subject group				
Mode of study	Part-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	6		ECTS credits		8.0		
Learning profile	general academic profile		Assessment form		assessment		
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		prof. dr hab. inż. Zbigniew Korczewski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	36.0	0.0	9.0	18.0	0.0	63
	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	63		0.0		0.0	63
Subject objectives	Explain the theoretical basis of the construction and operation of selected marine machinery and equipment. Teach the principles of their designing.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W08] has a knowledge of the analysis and design of selected technical systems, machines and technical equipment, selection of construction materials, manufacturing and operation, including their life cycle		Student knows calculation and selection methods within the designing process of the functional systems of the marine power plant.		[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U14] is able to analyse the operation of devices and compare the construction solutions applying usage, safety, environmental, economic and legal criteria		Student knows the design and principle of operation of the basic machinery and auxiliary equipment of the engine room.		[SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_U03] is able to identify, formulate and develop the documentation of a simple design or technological task, including the description of the results of this task in Polish or in a foreign language and to present the results using computer software or other aiding tools		Student is able to identify in terms of construction and parameters the selected marine machinery and devices on the basis of their technical documentation, as well as experimental examination conducted.		[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
	[K6_W11] has knowledge of analysis, design, technology and manufacturing of selected technical systems, machinery and equipment, metrology and quality control, knows and understands methods of measurement and calculation of basic quantities describing the operation of technical systems, knows basic calculation methods used to analyse experimental results		Student knows basic principles on designing, manufacturing and operation of the main marine machinery and devices.		[SW3] Assessment of knowledge contained in written work and projects		

Subject contents	<b>Lecture:</b> Introductory knowledge: the concept of a machine, device, system and technical system. Pumps: classification, construction, principle of operation, characteristics, capacity regulation, cooperation in pumping systems, cavitation phenomenon, application in ship installations. Compressors: classification, construction, principle of operation, characteristics, cooperation with the network, capacity control, the phenomenon of pumping in centrifugal compressors, application in ship installations. Working media purification devices: filtering, gravitational and dynamic sedimentation (centrifugation). Marine environment protection devices. Heat exchangers. Devices for desalination of sea water (evaporators, osmotic desalination plants). Ship devices for the protection of the marine environment. Ship steering devices (ship power hydraulics). <b>Laboratory:</b> Determination of the characteristics of the centrifugal pump on the laboratory stand of the pump system. Capacity adjustment of the piston compressor. Oil purification at the MAB104 centrifuge station - selection of the selective cover. Study of the plate heat exchanger. <b>Project:</b> Design of a marine pumping system: calculations of tanks and pipelines, selection of components and fittings.		
Prerequisites and co-requisites	Well-established knowledge of physics, fluid mechanics and the basics of mechanical engineering.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Raports on labs	100.0%	10.0%
	Design task	100.0%	20.0%
	Test	50.0%	70.0%
Recommended reading	Basic literature	Z. Górski: Ship Machinery and Auxiliary Devices, Volumes I and II, TRADEMAR, Gdynia 2010.(in Polish)  Z. Górski: Construction and operation of marine pumps, TRADEMAR, Gdynia 2010. (in Polish)  Z. Górski: Construction and operation of marine hydraulic devices, TRADEMAR, Gdynia 2008. (in Polish)  Z. Górski: Construction and operation of ship's steering gear, adjustable propellers and stern tubes, (in Polish)TRADEMAR, Gdynia, 2009.  M. Giernalczyk, Z. Górski: Z. Górski: Power plants Cz. 2. Ship installations, Gdynia Maritime University, Gdynia 2016. (in Polish)	
	Supplementary literature	H. D. McGeorge, Marine Auxiliary Machinery, Butterworth-Heinemann, UK, 1998.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	A cooperation profile of centrifugal pumps in a series and parallel configuration.  Design the bulk carrier ballast system.		
Work placement	Not applicable		

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