



Subject card

Subject name and code	Ship Equipment, PG_00060559						
Field of study	Naval Architecture and Offshore Structures						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2024/2025		
Education level	first-cycle studies		Subject group		Optional 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	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		9.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Zakład Siłowni Okrętowych -> Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Jacek Nakielski				
	Teachers		dr inż. Jacek Nakielski prof. dr hab. inż. Wojciech Litwin dr inż. Agnieszka Maczyszyn				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	45.0	30.0	15.0	30.0	0.0	120
	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	120		12.0		93.0	225
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_W03] has knowledge of hydromechanics, thermodynamics, machine design, ecology, materials science necessary to understand the principles of construction and operation of ocean engineering facilities and equipment		The student has the knowledge necessary to complete the design task.		[SW1] Assessment of factual knowledge		
	[K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems		The student has the knowledge necessary to complete the design task.		[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U06] in compliance with a formulated specification and with the aid of appropriate tools and methods, is able to complete a simple engineering task within the range of design, construction and operation of ocean technology objects and systems		The student has basic design skills.		[SU2] Assessment of ability to analyse information		

Subject contents	Lecture: 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). Laboratory: 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. Project: 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
	Test	50.0%	70.0%
	Design task	100.0%	20.0%
	Raports on labs	100.0%	10.0%
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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