



Subject card

Subject name and code	Ship Equipment, PG_00060559						
Field of study	Naval Architecture and Offshore Structures						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2025/2026		
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 hab. inż. Wojciech Litwin					
	Teachers						
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_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		
	[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_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		

Subject contents	<p>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.</p>														
Prerequisites and co-requisites	Well-established knowledge of physics, fluid mechanics and the basics of mechanical engineering.														
Assessment methods and criteria	<table border="1" data-bbox="448 584 1487 723"> <thead> <tr> <th data-bbox="448 584 794 618">Subject passing criteria</th> <th data-bbox="794 584 1141 618">Passing threshold</th> <th data-bbox="1141 584 1487 618">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 618 794 651">Reports on labs</td> <td data-bbox="794 618 1141 651">100.0%</td> <td data-bbox="1141 618 1487 651">10.0%</td> </tr> <tr> <td data-bbox="448 651 794 685">Design task</td> <td data-bbox="794 651 1141 685">100.0%</td> <td data-bbox="1141 651 1487 685">20.0%</td> </tr> <tr> <td data-bbox="448 685 794 723">Test</td> <td data-bbox="794 685 1141 723">50.0%</td> <td data-bbox="1141 685 1487 723">70.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Reports on labs	100.0%	10.0%	Design task	100.0%	20.0%	Test	50.0%	70.0%
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Reports on labs	100.0%	10.0%													
Design task	100.0%	20.0%													
Test	50.0%	70.0%													
Recommended reading	Basic literature	<p>Z. Górski: Ship Machinery and Auxiliary Devices, Volumes I and II, TRADEMAR, Gdynia 2010.(in Polish)</p> <p>Z. Górski: Construction and operation of marine pumps, TRADEMAR, Gdynia 2010. (in Polish)</p> <p>Z. Górski: Construction and operation of marine hydraulic devices, TRADEMAR, Gdynia 2008. (in Polish)</p> <p>Z. Górski: Construction and operation of ship's steering gear, adjustable propellers and stern tubes, (in Polish)TRADEMAR, Gdynia, 2009.</p> <p>M. Giernalczyk, Z. Górski: Z. Górski: Power plants Cz. 2. Ship installations, Gdynia Maritime University, Gdynia 2016. (in Polish)</p>													
	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	<p>A cooperation profile of centrifugal pumps in a series and parallel configuration.</p> <p>Design the bulk carrier ballast system.</p>														
Work placement	Not applicable														