



## Subject card

Subject name and code	, PG_00056315						
Field of study	Ocean Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2023/2024		
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	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	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. Damian Bocheński				
	Teachers		dr hab. inż. Damian Bocheński  mgr inż. Dominik Kreft				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	0.0	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		5.0		50.0	100
Subject objectives	To acquaint students with the principles of design and operation of pipeline installations						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems		The student describes the elements of the pipeline system and the method of their assembly		[SW1] Assessment of factual knowledge		
	[K6_W06] has an organized knowledge on engineering methods and design tools allowing the conducting of projects within the construction and operation of ocean technology objects and systems		The student explains the processes occuring during the flow of liquid or gas through the pipeline system		[SW1] Assessment of factual knowledge		
	[K6_U05] can formulate a simple engineering task and its specification within the range of design, construction and operation of ocean technology objects and systems		The student designs pipeline installations. It determines the basic parameters characterizing the pipeline installation. Selects appropriate pumps or compressors for the designed installation.		[SU1] Assessment of task fulfilment		
Subject contents	LECTURE Classification of pumps and pipeline installations. Energy balance of the pipeline installation. Characteristics of pipelines. Working conditions and pump characteristics. Vortex pumps, principle of operation, efficiency, high speed discriminant. Structural elements of centrifugal pumps. Cavitation. Application of centrifugal pumps. Positive displacement pumps, principle of operation, efficiency of positive displacement pumps and their application in a marine power plant. Compressor classification. Displacement compressors, work diagram, multi-stage compression. Vortex compressors - fans and blowers. EXERCISE Principles of calculating flow resistance. Rules for the selection of fittings. Calculations of selected installations in a marine engine room. Selection of pumps and compressors.						
Prerequisites and co-requisites	Thermodynamics, Fluid mechanics						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exam	60.0%	60.0%
	Exercise	60.0%	40.0%
Recommended reading	Basic literature	1.Troskołański A.T., Łazarkiewicz Sz.: Pompy wirowe. WNT Warszawa, 1973.  2.Jędrał W.: Pompy wirowe. PWN Warszawa, 2001.  3.Perepeczko A.: Okrętowe pompy, sprężarki i wentylatory. Wyd. Morskie 1976  4.Grabarczyk Cz.: Przepływ cieczy w przewodach (metody obliczeniowe). Enviratech Poznań, 1997.	
	Supplementary literature	Online catalogs	
	eResources addresses	Adresy na platformie eNauczanie: Okrętowe pompy i sprężarki - Moodle ID: 32419 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32419">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32419</a> Okrętowe pompy i sprężarki - Moodle ID: 32419 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32419">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32419</a>	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		