



## Subject card

Subject name and code	Pumps and Compressors, PG_00045073						
Field of study	Ocean Engineering, Ocean Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2022/2023		
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			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Faculty of Ocean 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 Address on the e-learning platform: <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19159">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19159</a>						
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	6.0		44.0		95
Subject objectives	To acquaint students with the principles of designing and operating pumping (and compressor) installations						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[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		
	[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 occurring during the flow of liquid or gas through the pipeline system			[SW1] Assessment of factual knowledge		
	[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		
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		
	Exercise	60.0%			50.0%		
	Exam	60.0%			50.0%		

Recommended reading	Basic literature	<p>1. Troskoleński A.T., Łazarkiewicz Sz.: Pompy wirowe. WNT Warszawa, 1973.</p> <p>2. Jędral W.: Pompy wirowe. PWN Warszawa, 2001.</p> <p>3. Perepeczko A.: Okrętowe pompy, sprężarki i wentylatory. Wyd. Morskie 1976</p> <p>4. Grabarczyk Cz.: Przepływ cieczy w przewodach (metody obliczeniowe). Enviratech Poznań, 1997.</p>
	Supplementary literature	Online catalogs
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Pompy i sprężarki - Moodle ID: 25735  <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25735">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25735</a></p> <p>Pompy i sprężarki - Moodle ID: 25735  <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25735">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25735</a></p>
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	