



## Subject card

Subject name and code	, PG_00056324						
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	6		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
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 inż. Daniel Piątek				
	Teachers		dr inż. Daniel Piątek  dr inż. Magdalena Kunicka  dr inż. Wojciech Leśniewski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	15.0	30.0	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=13349">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13349</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		49.0	100
Subject objectives	ability to design electric and hydraulic drive systems in marine applications						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U03] can use computer-aided design, production and operation tools for ocean technology objects and systems		The student is able to create simple spreadsheets for calculating layouts, graphic programs for documentation and internet resources for the selection of elements		[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		
	[K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems		The student is able to optimize the functioning of the electric / hydraulic drive system		[SW3] Assessment of knowledge contained in written work and projects		
	[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 knows the principles of operation of marine electrical and hydraulic systems		[SW3] Assessment of knowledge contained in written work and projects		
	[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 is able to design the structure of the electric / hydraulic system and select its components		[SU2] Assessment of ability to analyse information [SU5] Assessment of ability to present the results of task		

Subject contents	<p>PROJECT:</p> <p>design of a propulsion system for a vessel using electric and hydraulic power transmission, hybrid systems;</p> <ul style="list-style-type: none"><li>- loading conditions (similar units, sea conditions);</li><li>- system structure (electrical diagram, hydraulic diagram);</li><li>- calculations and selection of the main elements of the systems (generators, electric motors, pumps, hydraulic motors);</li><li>- selection of control system elements (energy converters, distributors and valves);</li><li>- comparison of technical and operational parameters of the electric and hydraulic systems;</li><li>- applications, technical documentation;</li></ul> <p>LABORATORY:</p> <p>tests of power flow in the marine propulsion system with hydraulic and electric power transmission;</p> <ul style="list-style-type: none"><li>- construction of laboratory stands;</li><li>- arrangement of measuring elements;</li><li>- power flow and system losses;</li><li>- preparation of spreadsheets for the development of results;</li><li>- quantitative and qualitative study of research results;</li><li>- conclusions;</li></ul>		
Prerequisites and co-requisites	basic knowledge of electric and hydraulic drive		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	project - project	60.0%	50.0%
	laboratory - raport	60.0%	50.0%
Recommended reading	Basic literature	1. Stryczek St.: Napęd hydrostatyczny, tom I Elementy, WNT Wa-wa. 2003 2. Stryczek St.: Napęd hydrostatyczny, tom II Układy, WNT Wa-wa. 2003 3. Szydelski Zb.: Napęd i sterowanie hydrauliczne, WKŁ WNT W - wa. 1999 4. Paszota Z.:Energy losses in hydrostatic drive,LAP LAMBERT Academic Publishing, Mauritius 2017	
	Supplementary literature	catalogs of manufacturers of components for power hydraulics and electric drives	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		