GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Electric and Hydraulic Drives, PG_00045113		
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	6	ECTS credits	3.0
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. Wojciech Leśniewski dr inż. Magdalena Kunicka	

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: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13349

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	4.0	26.0	75

Subject objectives

ability to design electric and hydraulic drive systems in marine applications

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 is able to optimize the functioning of the electric / hydraulic drive system	[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

PROJECT:
design of a propulsion system for a vessel using electric and hydraulic power transmission, hybrid systems;
- loading conditions (similar units, sea conditions);
- system structure (electrical diagram, hydraulic diagram);
- calculations and selection of the main elements of the systems (generators, electric motors, pumps, hydraulic motors);
- selection of control system elements (energy converters, distributors and valves);
- comparison of technical and operational parameters of the electric and hydraulic systems;
- applications, technical documentation;

LABORATORY:
tests of power flow in the marine propulsion system with hydraulic and electric power transmission;
- construction of laboratory stands;
- arrangement of measuring elements;
- power flow and system losses;
- preparation of spreadsheets for the development of results;
- quantitative and qualitative study of research results;
- conclusions;

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="2">basic knowledge of electric and hydraulic drive</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>laboratory - raport</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>project - project</td><td>60.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>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</td></tr>
<tr><td>Supplementary literature</td><td>catalogs of manufacturers of components for power hydraulics and electric drives</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:
Napędy elektryczne i hydrauliczne, LABORATORIUM, OCE, sem 6, lato 2022-23, (PG_00045113) - Moodle ID: 27405 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=27405
Napędy elektryczne i hydrauliczne, LABORATORIUM, OCE, sem 6, lato 2022-23, (PG_00045113) - Moodle ID: 27405 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=27405</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2"></td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
</table>