



Subject card

Subject name and code	Exploitation of mechatronics devices, PG_00057021						
Field of study	Mechatronics						
Date of commencement of studies	February 2024	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group			Obligatory subject group in the field of study 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	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Ryszard Jasiński				
	Teachers		dr hab. inż. Ryszard Jasiński				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	0.0	30
	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	30		4.0		16.0	50
Subject objectives	To acquaint students with the operation of typical mechatronic devices						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W10] knows development trends and most important new achievements in technical sciences and science disciplines: Mechanical Engineering, Automation, Electronics and Electrical Engineering and related: Informatics and Materials Engineering	The student knows the development trends and the most important new achievements in the field of technical sciences and scientific disciplines: Mechanical Engineering and Automation, Electronics and Electrical Engineering, appropriate for the field of Mechatronics studies. The student has knowledge of mechatronic design.	[SW3] Assessment of knowledge contained in written work and projects
	[K7_W02] has organised, general, supported by the theory knowledge in terms of systems theory and techniques, mechatronic design, mechatronic systems and exploitation of mechatronic devices	The student is able to identify and formulate the specification of tasks in the field of designing mechatronic devices.	[SW3] Assessment of knowledge contained in written work and projects
	[K7_K02] understand the need for formulating and communicate to the society information and opinions concerning mechatronic achievements and non-technical aspects of mechatronics engineer work; makes effort to communicate these information and opinions in widely understandable manner, representing various points of view	The student understands the need to formulate and transmit to the public information and opinions on the achievements of mechatronics and non-technical aspects of mechatronics engineer activity.	[SK5] Assessment of ability to solve problems that arise in practice
[K7_W07] has basic knowledge on lifecycle of devices, objects and technical systems	The student has basic knowledge about the life cycle of technical devices, facilities and systems as well as the ability to assemble some mechatronic devices and systems.	[SW3] Assessment of knowledge contained in written work and projects	
Subject contents	Introduction to the operation of mechatronic devices. Diagnostics of hydraulic (hydrotronic) systems. Measurement systems. Hydraulic fluids. Operation of hydraulic systems (hydrotronic). First start of the hydraulic system (hydrotronic). Cleaning the hydraulic system (hydrotronic) from contamination (rinsing the hydraulic system). Operation of hydraulic (hydrotronic) devices and systems in various environmental conditions. Methods for determining the parameter areas of the correct or incorrect operation of the unit and the hydraulic (hydrotronic) system. Safe commissioning and operation of mechatronic machines and devices. Directives on the safety of machinery and work protection for users. Responsibility for a dangerous product. Identification of threats. Safe design. Technical protective measures. Safe work with mechatronic devices and systems.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		56.0%	50.0%
		56.0%	50.0%

Recommended reading	Basic literature	<p>Podstawowa lista lektur</p> <ol style="list-style-type: none"> 1. James B. Hannon, ExxonMobil Corporation, Performance evaluation of new and in-service turbine oils. Practicing Oil Analysis Magazine 2. Przewodnik Bezpieczne Maszyny. Bezpieczna maszyna w sześciu krokach. SICK 3. Jarosław Biały, Marian J. Łopatka: Wybrane problemy doboru czynnika roboczego w hydrostatycznych układach napędu i sterowania 4. Vademecum hydrauliki, Rexroth, Tom I, II, III 5. Jasiński R.: Działanie wybranych wolnoobrotowych silników hydraulicznych w warunkach szoku termicznego. Rozprawa doktorska. Politechnika Gdańska, Wydz. Mechaniczny, Gdańsk 2002. 6. Jasiński R.: Funkcjonowanie zespołów napędu hydraulicznego maszyn w niskich temperaturach otoczenia. Monografia 166, Gdańsk 2018. 7. Szenajch W.: Napęd i sterowanie pneumatyczne. WNT Warszawa 1997. 8. Niegoda J., Pomierski W.: Sterowanie pneumatyczne. Skrypt PG. Gdańsk 1998. 9. Schmid D. i inni: Mechatronika, ISBN 83-7141-425-0, Warszawa 2002. 10. Praca zbiorowa: Urządzenia i systemy mechatroniczne. Cz.1, 2. Wydawnictwo REA, 2009
	Supplementary literature	<ol style="list-style-type: none"> 1. Osiecki A: Napęd i sterowanie hydrauliczne maszyn. Teoria, obliczanie i układy. Skrypt PG, Gdańsk 1995. 2. Osiecki A.: Hydrostatyczny napęd maszyn. WNT Warszawa 1998. 3. Stryczek S.: Napęd hydrostatyczny. Tom I Elementy. Tom II Układy. WNT Warszawa 1990. 4. Heiman B., Gerth W., Popp K.: Mechatronika, metody, przykłady, tłum. Gawrysiak M., Wydawnictwo Naukowe PWN, Warszawa, 2001. 5. Gawrysiak M.: Mechatronika i projektowanie mechatroniczne, Rozprawy Naukowe Nr 44, Polit. Białostocka, Białystok, 1997
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Eksploatacja urządzeń mechatronicznych 2024 - Moodle ID: 36187 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36187</p>
Example issues/ example questions/ tasks being completed	<p>Sample questions: Diagnostics and monitoring of hydraulic systems. Machinery safety directives. Risk assessment documentation.</p>	
Work placement	<p>Not applicable</p>	