



Subject card

Subject name and code	Construction and operation of mechatronic systems, PG_00055469						
Field of study	Mechatronics						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2023/2024		
Education level	first-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	3	Language of instruction			Polish		
Semester of study	6	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			exam		
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	15.0	15.0	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	2.0		28.0	75	
Subject objectives	The aim of the course is to acquaint students with the construction and operation of mechatronic systems.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W10] has a basic knowledge about development trends in terms of engineering and technical sciences and scientific disciplines: Mechanical Engineering, Automation, Electronics and Electrical Engineering, adequate for Mechatronics course	Student has basic knowledge about development trends in the field of technical sciences and scientific disciplines: Construction and operation of machines, Mechanics appropriate for the field of Mechatronics studies. Student explains the structure and principle of operation of mechatronic systems.			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U09] is able to formulate an algorithm, knows low and high level programming languages and appropriate IT tools for developing computer programmes to control mechatronic system	Student selects the basic elements (catalog) for the mechatronic system (actuators, sensors, control elements, drivers). Student designs manipulators of mechatronic systems. Student programs PLC controllers.			[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment		
	[K6_W11] has a basic knowledge about the life cycle of mechatronic systems and objects	Student has a basic knowledge of the life cycle of mechatronic devices, facilities and systems. Student explains the structure and principle of operation of mechatronic systems.			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U08] is able - according to a given specification - design, calculate costs and develop a simple device, object, system or process typical for mechatronics, using appropriate methods, techniques and tools	Student designs manipulators of mechatronic systems.			[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		

Subject contents	<p>Lecture Construction of typical mechatronic systems. Functions of modules and elements of mechatronic systems. Principles of designing mechatronic systems that perform specific functions and meet given requirements. Basic calculations and rules for the selection of (catalog) elements for the mechatronic system (actuators, sensors, controls, drivers). Methods of assembling mechatronic elements (construction elements, connectors, cable routing, etc.). Principles of operation of mechatronic systems. Basics of programming the visualization of mechatronic system processes (SCADA).</p> <p>Laboratory</p> <p>PLC programming of the MAS-200 assembly system modules</p>														
Prerequisites and co-requisites	<p>Fundamentals of automation Basics of hydraulics and pneumatics Elements of mechatronic systems Modeling of mechatronic systems Mechatronic design</p>														
Assessment methods and criteria	<table border="1" data-bbox="448 851 1487 992"> <thead> <tr> <th data-bbox="448 851 798 891">Subject passing criteria</th> <th data-bbox="801 851 1141 891">Passing threshold</th> <th data-bbox="1144 851 1487 891">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 891 798 922"></td> <td data-bbox="801 891 1141 922">56.0%</td> <td data-bbox="1144 891 1487 922">35.0%</td> </tr> <tr> <td data-bbox="448 922 798 954"></td> <td data-bbox="801 922 1141 954">56.0%</td> <td data-bbox="1144 922 1487 954">40.0%</td> </tr> <tr> <td data-bbox="448 954 798 992"></td> <td data-bbox="801 954 1141 992">56.0%</td> <td data-bbox="1144 954 1487 992">25.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade		56.0%	35.0%		56.0%	40.0%		56.0%	25.0%
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Recommended reading	Basic literature	<p>1. Heiman B., Gerth W., Popp K.: Mechatronika, metody, przykłady, tł. Gawrysiak M., Wydawnictwo Naukowe PWN, Warszawa, 2001</p> <p>2. Gawrysiak M.: Mechatronika i projektowanie mechatroniczne, Rozprawy Naukowe Nr 44, Polit. Białostocka, Białystok, 1997</p> <p>3. Schmid D. i inni: Mechatronika, ISBN 83-7141-425-0, Warszawa 2002</p>													
	Supplementary literature	<p>1. Catalogs of companies producing actuators, sensors, controllers (FESTO, SMC, Rexroth, Siemens, Simex)</p>													
	eResources addresses	<p>Adresy na platformie eNauczanie: Budowa i eksploatacja systemów mechatronicznych 2024 - Moodle ID: 36191 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36191</p>													
Example issues/ example questions/ tasks being completed															
Work placement	Not applicable														