



## Subject card

Subject name and code	Building and operating of mechatronic systems, PG_00050271						
Field of study	Mechatronics, Mechatronics						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2022/2023		
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			4.0		
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	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	7.0		48.0		100
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_U10	Student in formulating and solving engineering mechatronics sees them and non-technical aspects of the system.			[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		
	K6_U08	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		
	K6_U09	Student selects basic (catalog) elements for the mechatronic system (actuators, sensors, control elements, PLC). 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	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_W10	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		

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). Laboratory 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"> <thead> <tr> <th data-bbox="456 723 798 757">Subject passing criteria</th> <th data-bbox="801 723 1141 757">Passing threshold</th> <th data-bbox="1144 723 1481 757">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 759 798 788"></td> <td data-bbox="801 759 1141 788">56.0%</td> <td data-bbox="1144 759 1481 788">30.0%</td> </tr> <tr> <td data-bbox="456 790 798 819"></td> <td data-bbox="801 790 1141 819">56.0%</td> <td data-bbox="1144 790 1481 819">30.0%</td> </tr> <tr> <td data-bbox="456 822 798 851"></td> <td data-bbox="801 822 1141 851">56.0%</td> <td data-bbox="1144 822 1481 851">40.0%</td> </tr> </tbody> </table>	Subject passing criteria	Passing threshold	Percentage of the final grade		56.0%	30.0%		56.0%	30.0%		56.0%	40.0%		
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Recommended reading	<p>Basic literature</p>	<p>1. Heiman B., Gerth W., Popp K.: Mechatronika, metody, przykłady, tłum. 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 - Moodle ID: 28758 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=28758">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=28758</a></p>													
Example issues/ example questions/ tasks being completed	<p>Sample questions: Drive chain - construction and principle of operation. Pneumatic grippers. Comparison of basic drivetrain systems. Advantages and disadvantages of the SCADA system.</p>														
Work placement	Not applicable														