



Subject card

Subject name and code	Mechatronic design, PG_00033865						
Field of study	Nanotechnology						
Date of commencement of studies	October 2020	Academic year of realisation of subject				2022/2023	
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	5	ECTS credits				2.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Zakład Mechatroniki -> Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Krzysztof Kaliński					
	Teachers	prof. dr hab. inż. Krzysztof Kaliński dr inż. Natalia Stawicka-Morawska					
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		1.0		19.0	50
Subject objectives	Acquiring basic knowledge and skills in scope of mechatronic design.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	K6_U04		The student identifies the phenomena related to the functioning mechatronic systems			[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools	
	K6_W09		The student recognizes the methods designing the structure of circuits mechatronic and observed signals. Student defines team tasks mechatronic design			[SW1] Assessment of factual knowledge	
	K6_U07		The student shows composure design methods mechatronic systems stationary and economics of their use.			[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools	
Subject contents	<p>LECTURES. Basic definitions and terms of mechatronics. Modelling in mechatronics. Models of mechatronic systems components. Analogies between physical environments. Dynamic equations in generalised coordinates. Transfer function. Static characteristics. The problems of mechatronic design. Means of the mechatronic projects performance. Modelling of multi-body systems. Eigenvibrations of the finite-degree-of-freedom systems.</p> <p>LABORATORY. Identification of mechatronic component in the projects. Propositions of mechatronic solutions and concept of their performance.</p>						

Prerequisites and co-requisites	<p>Mechanics of solids and fluids.</p> <p>Introduction to electronics and electrical engineering.</p> <p>Automatics</p>		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Passing colloquium	50.0%	50.0%
	Project	100.0%	50.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Gawrysiak M.: Mechatronics and mechatronic design. Białystok: The Publication of BUT 1997 (accessible in internet). 2. Heimann B., Gerth W., Popp K.: Mechatronics. Components methods examples. Warszawa: Scientific Publication PWN 2001. 3. Mechatronic design. Chosen problems. (Ed. T. Uhl). Kraków: Chair of Robotics and Mechatronics AGH 2006, 2007, 2008, 2010, 2011. 4. Cannon R. H.: Dynamics of physical systems. Warszawa: WNT 1973. 	
	Supplementary literature	<ol style="list-style-type: none"> 1. Kaczorek T.: Control and systems theory. Warszawa: Scientific Publication PWN 1993. 2. Kaliński K.: A surveillance of dynamic processes in mechanical systems. Gdańsk: The Publication of GUT 2012. 3. Grzeżożek W., Adamiec-Wójcik I., Wojciech S.: Computer modelling of the car vehicles dynamics. Kraków: The T. Kościuszko Cracow University of Technology 2003. 	
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Projektowanie mechatroniczne, W, Nanotechnologia, sem. 5, zimowy 2022/23 (NAN1C029) - Moodle ID: 26992 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26992</p>	
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. Development of functional systems design. The tasks of mechatronic design. 2. The dissipating energy components of mechatronic systems. 3. 2-wheeled mobile robot as example of original mechatronic device. 4. Example of mechatronic design on a basis about the only systems knowledge. 5. Modelling of multi-body systems. Dynamic equations. 		
Work placement	Not applicable		