



## Subject card

Subject name and code	, PG_00056111						
Field of study	Mechatronics						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2024/2025		
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	5	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. Piotr Mioduszewski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	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		0.0		0.0	30
Subject objectives	To familiarize students with issues related to the construction and maintenance of mechatronic systems in modern vehicles.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U02] is able to elaborate on specific mechatronic topics as well as topics from engineering and technical sciences and disciplines such as Mechanical Engineering, Automation, Electronics and Electrical Engineering		Student knows the structure of mechatronics systems in vehicles and heavy machinery, explains principles of operation of mechatronics systems.		[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	[K6_U05] is able to use properly chosen tools to compare design solutions of elements and mechatronics systems according to given application and economic criterions (e.g. power demand, speed, costs)		The student is able to perform diagnostics of mechatronic systems in vehicles and heavy machinery.		[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject		
	[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 is up to date with new developments in technology in mechatronic systems in vehicles and working machines.		[SW1] Assessment of factual knowledge		
Subject contents	Controller area network, communication systems in vehicles (CAN, LIN). Sensors and controllers used in vehicles and heavy machinery. Active and passive safety systems in vehicles (braking, traction control, skidding). Vehicle lighting systems (intelligent lighting systems). Driving and travelling comfort systems (parking assists, adaptive cruise control, information, navigation, ventilation, climate control, vehicle theft protection). Active vehicle suspension systems. Modern steering systems. Automatic gearboxes. Mechatronic systems in heavy machinery.						
Prerequisites and co-requisites	Knowledge of mechanics of machines and devices. Basic knowledge of the construction of machines and devices. Fundamentals of electronics and electrical engineering. Fundamentals of computer science.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Test		50.0%		100.0%		

Recommended reading	Basic literature	<p>Bosch Automotive Handbook 6th Edition, Bentley Publishers, USA, 2005</p> <p>The Mechatronics Handbook By Robert H. Bishop, CRC Press, 2002.</p> <p>Current internet articles on solutions for mechatronic systems in vehicles and heavy machinery.</p>
	Supplementary literature	Mechatronics and the Design of Intelligent Machines and Systems By David A. Bradley, CRC Press, 2000.
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	