



Subject card

Subject name and code	, PG_00058635						
Field of study	Mechatronics						
Date of commencement of studies	February 2024		Academic year of realisation of subject		2024/2025		
Education level	second-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Zakład Pojazdów Mechanicznych i Techniki Militarnej -> 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		dr hab. inż. Piotr Mioduszewski				
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	The aim of the course is to familiarise students with the construction of vehicles and the principles of operation of mechatronic systems found in vehicles so that, on this basis, they are able to design and build (as part of another course) simple functional models of remote-controlled vehicles.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U04] is able to utilise known methods and mathematical models, as well as computer simulations for analysis and evaluation of non-stationary continuous and discrete mechatronic systems and processes	The student is able to describe the structure and principle of operation of individual control systems in modern vehicles.	[SU3] Assessment of ability to use knowledge gained from the subject
	[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 has basic knowledge of development trends in the construction and operation of mechatronic systems in modern vehicles.	[SW1] Assessment of factual knowledge
	[K7_W06] has detailed, supported by the theory knowledge in terms of mechatronic design, mechatronic systems and machines, devices and process where they are used	The student has knowledge related to the issues of mechatronic design and mechatronic systems found in vehicles.	[SW3] Assessment of knowledge contained in written work and projects
	[K7_W01] has extended knowledge in terms of selected areas of mathematics, including discrete and applied mathematics, optimisation methods, mathematical and numerical methods essential for: 1) modelling and analysis of nonstationary mechatronics, continuous and discrete time systems as well as physical phenomena; 2) description and analysis of mechatronic systems that include programmable devices 3) description and analysis of signal processing algorithms 4) synthesis of non-stationary mechatronic systems	The student is able to model mechatronic systems used in modern vehicles.	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation
Subject contents	Propulsion sources in vehicles. Vehicle motion resistance. Wheels and tires of modern vehicles. Drive mechanism systems, including hybrid and electric drive systems. Vehicle main clutches, including automatic clutches and their control. Automatic transmissions and their control. Vehicle active suspensions.		
Prerequisites and co-requisites	No requirements		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final test	50.0%	100.0%
Recommended reading	Basic literature	1. Poradnik mechatronika. Wydawnictwo Rea, 2022. 2. Projektowanie urządzeń i systemów mechatronicznych. Kwalifikacja E.19.2. Podręcznik do nauki zawodu. Michał Tokarz. WSIP. 3. Sprzęgła, skrzynki biegów, wały i półosie napędowe. Axel Sprenger, Rainer Popiol, Werner Micknass. Wydawnictwa Komunikacji i Łączności WKŁ. 2014. 4. Samochodowe magistrale danych w praktyce warsztatowej. Martin Frei. Wydawnictwa Komunikacji i Łączności WKŁ. 2016. 5. Mechanika ruchu. Pojazdy samochodowe. Leon Prochowski. Wydawnictwa Komunikacji i Łączności WKŁ. 2016. 6. Poradnik inżyniera samochodowego. Elementy i materiały. Zbigniew Jaśkiewicz i in. Wydawnictwa Komunikacji i Łączności WKŁ. 1990.	
	Supplementary literature	-	

	eResources addresses	Adresy na platformie eNauczenie:
Example issues/ example questions/ tasks being completed	<p>Propulsion sources in vehicles.</p> <p>Vehicle motion resistance.</p> <p>Wheels and tires of modern vehicles.</p> <p>Drive mechanism systems, including hybrid and electric drive systems.</p> <p>Vehicle main clutches, including automatic clutches and their control.</p> <p>Automatic transmissions and their control.</p> <p>Vehicle active suspensions.</p>	
Work placement	Not applicable	

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