GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mechatronics od vehicles and working machinery, PG_00064798		
Field of study	Mechatronics		
Date of commencement of studies	February 2025	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Specialty 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	1	Language of instruction	Polish
Semester of study	2	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	4.0	16.0	50

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
[K7_W03] demonstrates structured and theory supported knowledge encompassing key issues in the field of Mechatronics, enabling developement and synthesis of stationary and non-stationary mechatronic systems, devices, and processes with continuous and discrete operation	Student demonstrates basic knowledge of development trends in the construction and operation of mechatronic systems in modern vehicles.	[SW1] Assessment of factual knowledge
[K7_W04] demonstrates knowledge encompassing selected issues in the field of detailed knowledge, particularly in the scope of methods, techniques, tools, and algorithms specific to Mechatronics	The student describes the structure and explains the principles of maitenence of mechatronic devices and systems in vehicles.	[SW1] Assessment of factual knowledge
[K7_U11] communicates and justifies opinions on specialized topics in a manner understandable to diverse audiences, including the use of modern techniques, including information technology	Student is able to determine the correct operation of mechatronic systems in vehicles and indicate possible malfunctions.	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information
[K7_U03] identifies and formulates task specifications in the scope of stationary and non-stationary mechatronic systems/processes design, including non-standard problems ans taking into consideration their non-technical aspects	Student explains principles of operation of mechatronic devices and systems in vehicles.	[SU3] Assessment of ability to use knowledge gained from the subject

Subject contents

Controller area network, communication systems in vehicles (CAN, LIN). Sensors and controllers used in vehicles. 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.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">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.</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Test</td><td>60.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Bosch Automotive Handbook 6th Edition, Bentley Publishers, USA, 2005

The Mechatronics Handbook By Robert H. Bishop, CRC Press, 2002.

Current internet articles on solutions for mechatronic systems in vehicles and heavy machinery.</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">Mechatronics and the Design of Intelligent Machines and Systems By David A. Bradley, CRC Press, 2000.</td></tr>
<tr><td>eResources addresses</td><td colspan="2">Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">Controller area network, communication systems in vehicles. Sensors and controllers used in vehicles. Active and passive safety systems in vehicles. Vehicle lighting systems. Driving and travelling comfort systems. Active vehicle suspension systems. Modern steering systems.</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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