GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00058635		
Field of study	Mechatronics		
Date of commencement of studies	February 2022	Academic year of realisation of subject	2022/2023
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		
	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	The aim of the course is to familiarize students with the issues listed below. Propulsion sources in vehicles. Vehicle motion resistance. Balance of power, moments and forces. Wheels and tires of modern vehicles. Drive mechanism systems, including hybrid and electric drive systems. Vehicle main clutches, including automatic clutches and their control. Designing an automatic clutch of a modern vehicle. Automatic gearboxes and their control. Vehicle differentials with remotely or automatically regulated internal friction and their control.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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 knows how to replace the power sources used in vehicles. Describes the resistance to motion of the vehicle. Performs a balance of power, moments and forces. It presents the wheels and tires of modern vehicles. Describes drive mechanism systems, including hybrid and electric drive systems, vehicle main clutches, including automatic clutches and their control. He can design an automatic clutch of a modern vehicle, an automatic transmission and its control. He knows the structure of vehicle differentials with remotely or automatically regulated internal friction and their control.	[SW1] Assessment of factual knowledge [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 knows how to replace the power sources used in vehicles. Describes the resistance to motion of the vehicle. Performs a balance of power, moments and forces. It presents the wheels and tires of modern vehicles. Describes drive mechanism systems, including hybrid and electric drive systems, vehicle main clutches, including automatic clutches and their control. He can design an automatic clutch of a modern vehicle, an automatic transmission and its control. He knows the structure of vehicle differentials with remotely or automatically regulated internal friction and their control.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
	[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 knows how to replace the power sources used in vehicles. Describes the resistance to motion of the vehicle. Performs a balance of power, moments and forces. It presents the wheels and tires of modern vehicles. Describes drive mechanism systems, including hybrid and electric drive systems, vehicle main clutches, including automatic clutches and their control. He can design an automatic clutch of a modern vehicle, an automatic transmission and its control. He knows the structure of vehicle differentials with remotely or automatically regulated internal friction and their control.	[SU3] Assessment of ability to use knowledge gained from the subject [SU5] Assessment of ability to present the results of task
	[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 knows how to replace the power sources used in vehicles. Describes the resistance to motion of the vehicle. Performs a balance of power, moments and forces. It presents the wheels and tires of modern vehicles. Describes drive mechanism systems, including hybrid and electric drive systems, vehicle main clutches, including automatic clutches and their control. He can design an automatic clutch of a modern vehicle, an automatic transmission and its control. He knows the structure of vehicle differentials with remotely or automatically regulated internal friction and their control.	[SW1] Assessment of factual knowledge

Subject contents	Propulsion sources in vehicles. Vehicle motion resistance. Balance of power, moments and forces. Wheels and tires of modern vehicles. Drive mechanism systems, including hybrid and electric drive systems. Vehicle main clutches, including automatic clutches and their control. Designing an automatic clutch of a modern vehicle. Automatic gearboxes and their control. Vehicle differentials with remotely or automatically regulated internal friction and their control.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="2">No requirements</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Final test at the end of the semester</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>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.</td></tr>
<tr><td>Supplementary literature</td><td>-</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">-</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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