GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00056108		
Field of study	Mechatronics		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
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	Division of Mechanical Vehicles and Military Technology -> Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Grzegorz Ronowski	
	Teachers	dr hab. inż. Grzegorz Ronowski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	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 provide students with basic knowledge in the field of construction and general principles of designing motor vehicle drive systems .

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U05] is able to use properly chosen tools to compare design solutions of elements and mechatronics systems according to given application and economic criteria (e.g. power demand, speed, costs)	The student knows the construction of typical types of drive systems used in motor vehicles. It is able to choose the right layout due to the usage criteria.	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
[K6_W11] has a basic knowledge about the life cycle of mechatronic systems and objects	The student defines the work cycle of individual vehicle mechanisms. It can correctly select the components of the drive system.	[SW1] Assessment of factual knowledge
[K6_W10] has a basic knowledge about development trends in the field of engineering and technology sciences and scientific disciplines: Mechanical Engineering, Automation, Electronics, Electrical Engineering and Space Technologies, adequate for Mechatronics curse	The student classifies the components of the vehicle. He knows the specifics of the operation of the propulsion system mechanisms. He has a basic knowledge of motor vehicle construction.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation

Subject contents

General construction of the car . Engine characteristics and necessary drive mechanisms . Drive mechanisms . Clutches - types used . Design , operation and calculation of friction couplings . Friction clutch components . Switching mechanisms . Automatic control systems . Torque converters . Stepped gearboxes . Synchronizers and gear shifters . Planetary gearboxes . Automate shifting . Additional gearboxes . Drive shafts and joints . Drive shaft systems . Critical shaft speed . Joint theory and design solutions . Drive bridges : types , construction and calculation . Differentials , half -axles and wheel bearings .

Prerequisites and co-requisites

<table>
<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>Colloquium</td><td>50.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Studziński K.: Samochód teoria, konstrukcja i obliczanie

Jaśkiewicz Z.: Projektowanie układów napędowych pojazdów samochodowych.</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">Reimpel J.: Budowa samochodów Podstawy Konstrukcji

Zając M.: Układy przeniesienia napędu samochodów ciężarowych i autobusów</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">1 . Differential design .
2 . Construction of the front combined drive system .
3 . Independent suspension working principle .</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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