



Subject card

Subject name and code	, PG_00057927						
Field of study	Mechanical Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2022/2023		
Education level	first-cycle studies	Subject group					
Mode of study	Part-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	6	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						
	Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22159						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	
	Number of study hours	30		0.0		0.0	
Subject objectives	Provide students with basic knowledge in the field of construction and general principles of designing drive systems of motor vehicles and transport devices..						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W08] possesses basic knowledge including the methodology of designing machine parts, mechanical devices, selection of construction materials, manufacturing and operation, with the lifetime cycle		The student knows the functions performed by the clutch in the drive system of the vehicle. Defines the dimensions of the clutch friction lining.		[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U07] is able to design a typical construction of a mechanical device, component or a testing station using appropriate methods and tools, adhering to the set usage criteria		The student selects the motor for the off-road car winch.		[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		

Subject contents	<p>LECTURES The general structure of the car. Characteristics of the engine and the necessary drive mechanisms. Drive mechanisms systems. Clutches - types used. Construction, operation and calculation of friction clutches. Elements of friction clutches. Engagement mechanisms. Automatic control systems. Fluid clutches. Stepped gearboxes. Synchronizers and gear shifting mechanisms. Planetary gears. Automation of gear shifting. Additional gear boxes. Drive shafts and joints. Drive shaft systems. Critical shaft speed. The theory of joints and design solutions. Driving bridges: types, construction and calculation. Differentials, driveshafts and wheel bearings. Construction and design principles of transport devices used in automotive technology, winches, lifts, etc.</p> <p>LABORATORY. General assessment of the technical condition of the vehicle. Measurement and adjustment of the wheel alignment of the main gear of the driving axle. Balancing road wheels of a car, assembly and disassembly of car tires. Measurements of external vehicle noise. Compression pressure measurement in an internal combustion engine. Checking the headlight settings in the vehicle. Determination of the car rolling resistance coefficient.</p>											
Prerequisites and co-requisites	Knowledge of the basics of machine construction, construction record.											
Assessment methods and criteria	<table border="1" data-bbox="448 725 1489 824"> <thead> <tr> <th data-bbox="448 725 799 757">Subject passing criteria</th> <th data-bbox="804 725 1139 757">Passing threshold</th> <th data-bbox="1144 725 1489 757">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 763 799 795">Tests during the semester</td> <td data-bbox="804 763 1139 795">60.0%</td> <td data-bbox="1144 763 1489 795">50.0%</td> </tr> <tr> <td data-bbox="448 801 799 824">Practical exercises</td> <td data-bbox="804 801 1139 824">100.0%</td> <td data-bbox="1144 801 1489 824">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Tests during the semester	60.0%	50.0%	Practical exercises	100.0%	50.0%
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Tests during the semester	60.0%	50.0%										
Practical exercises	100.0%	50.0%										
Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Studziński K.: Samochód teoria, konstrukcja i obliczanie. Wyd. Naukowo-Techniczne, Warszawa, 1980. 2. Reimpel J.: Budowa samochodów Podstawy Konstrukcji, WKŁ, Warszawa, 1997. 3. Zając M.: Układy przeniesienia napędu samochodów ciężarowych i autobusów. WKŁ, Warszawa, 2003. 4. Dębicki M.: Teoria samochodu, teoria napędu. WKŁ. Warszawa. 1975. 5. Prochowski L.: Pojazdy samochodowe, mechanika ruchu. WKŁ. Warszawa. 2005. 6. Instrukcje do ćwiczeń laboratoryjnych. 										
	Supplementary literature	<ol style="list-style-type: none"> 1. Jaśkiewicz Z.: Projektowanie układów napędowych pojazdów samochodowych. WKŁ, Warszawa, 1982. 2. Hebda M., Niziński S., Pelc H.: Podstawy diagnostyki pojazdów mechanicznych. WKŁ. Warszawa. 1980. 										
	eResources addresses	Adresy na platformie eNauczanie:										
Example issues/ example questions/ tasks being completed	Functions performed by the vehicle's main clutch. Draw a kinematic diagram of the indicated mechanism.											
Work placement	Not applicable											