



Subject card

Subject name and code	Mechatronics in combustion and hybrid engines, PG_00056116						
Field of study	Mechatronics						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2026/2027		
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	6	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Zbigniew Kneba					
	Teachers						
Lesson types	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	Acquainting students with modern car propulsion systems with an internal combustion engine Acquainting students with contemporary car propulsion systems with an internal combustion engine						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W08] knows and understands design and production processes of elements and simple mechatronic devices	Selects accessories for combustion and electric engines			[SW1] Assessment of factual knowledge		
	[K6_U06] is able to identify and formulate specification of simple, practical engineering tasks, distinctive for mechatronics	He knows the structure and tasks of the car's propulsion sources			[SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_W10] has 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 course	Analyzes the solutions of drive systems in terms of efficiency and environmental nuisance.			[SW1] Assessment of factual knowledge		
	[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)	Designs by selecting elements from catalogs.			[SU4] Assessment of ability to use methods and tools		
Subject contents	Course content – lecture Construction of internal combustion engines. Fuel, air and ignition systems. Alternative fuel engines. Characteristics of internal combustion engines - cooperation with an energy receiver. Characteristics of engines and generators. Structures hybrid drive systems. Electric batteries.						
Prerequisites and co-requisites	Thermodynamics. Electrotechnics.						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	written test	50.0%			100.0%		
Recommended reading	Basic literature	Guzella L.: Vehicle propulsion systems Springer					

	Supplementary literature	Zou Y.: Modeling and Control of Hybrid Propulsion System for Ground Vehicles Springer
	eResources addresses	
Example issues/ example questions/ tasks being completed	Draw the structure of the serial drive train of a passenger car. Replace the main control variables of the accumulative diesel fuel injection system.	
Practical activities within the subject	Not applicable	

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