



## Subject card

Subject name and code	, PG_00056116						
Field of study	Mechatronics						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2023/2024		
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						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Zbigniew Kneba				
	Teachers		dr hab. inż. Zbigniew Kneba				
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	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_U05] is able to use properly choosen tools to compare design solutions of elements and mechatronics systems according to given application and economic crtierions (e.g. power demand, speed, costs)		Designs by selecting elements from catalogs.		[SU4] Assessment of ability to use methods and tools		
	[K6_W10] has a basic knowledge about development trends in terms of engineering and technical sciences and scientific disciplines: Mechanical Engineering, Automation, Electronics and Electrical Engineering, adequate for Mechatronics curse		Analyzes the solutions of drive systems in terms of efficiency and environmental nuisance.		[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_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		
Subject contents	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	Adresy na platformie eNauczenie: Mechatronika w napędach spalinowych i hybrydowych - Moodle ID: 35359 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=35359">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=35359</a>
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.	
Work placement	Not applicable	