



Subject card

Subject name and code	Fuel Systems and of Combustion Engines, PG_00039975						
Field of study	Mechanical Engineering, Mechanical Engineering						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2022/2023		
Education level	first-cycle studies		Subject group		Optional subject group Subject group related to scientific research in the field of study		
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		3.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Zakład Ekoinżynierii i Silników Spalinowych -> 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	15.0	0.0	0.0	45
	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	45		6.0		24.0	75
Subject objectives	To acquaint students with the current designs of fuel and air supply systems. Presentation of the operation of ignition systems of spark-ignition engines. Cooling and lubrication systems are also discussed. Particular emphasis was placed on solutions that reduce the harmfulness of engines to the natural environment. Vehicle tests were presented to evaluate their properties.						
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		Understands the fuel, air and engine ignition processes.		[SW1] Assessment of factual knowledge		
	[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		He can select engine accessories components		[SU3] Assessment of ability to use knowledge gained from the subject		
Subject contents	Petrol supply systems for spark ignition engines: multipoint direct and indirect injection. Electric ignition systems. Supply with LPG, CNG and LNG gas fuels. Diesel fueling: unit injectors and common rail. Emissivity tests of engines. Programming of drivers. Electronically controlled cooling systems. Lubrication systems. Development trends of drives with internal combustion engines.						
Prerequisites and co-requisites	Knowledge of the design and operation of internal combustion engines is required						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
			50.0%		100.0%		
Recommended reading	Basic literature		www,combustion-engines.eu				
	Supplementary literature		.				
	eResources addresses		Adresy na platformie eNauczanie:				
Example issues/ example questions/ tasks being completed	Draw a graph of the oxygen sensor signal after the accelerator pedal is depressed sharply and then released as a function of time.						

Work placement	Not applicable
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