



Subject card

Subject name and code	Power plants with internal combustion engines design, PG_00057394						
Field of study	Mechanical Engineering						
Date of commencement of studies	February 2024	Academic year of realisation of subject			2024/2025		
Education level	second-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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
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. Jacek Kropiwnicki					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	15.0	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	The aim of the course is to introduce scientists to the program of designing and commissioning stationary devices with piston engines.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_U07] is able to perform a preliminary economic analysis of the undertaken engineering actions within the range of design, production and operation of machines and technical devices	can select machines and equipment for stationary combustion power plants with intensive use of waste heat from manufacturers' catalogs			[SU1] Assessment of task fulfilment		
	[K7_W05] possesses profound knowledge on the operation of complex systems and mechanical devices, including process equipment	has knowledge of the operation of combined heat and power production systems			[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	[K7_W10] possesses knowledge on the methods of technical and economic analysis of industrial systems and optimization of manufacturing systems; is familiar with the general principles of initiating and developing forms of individual entrepreneurship, particularly for innovative projects using the knowledge	can optimize the electricity and heat generation system and add energy accumulation systems.			[SW3] Assessment of knowledge contained in written work and projects		
Subject contents	Construction of high-power combustion engines. Stationary power plants with piston engines, Monitoring of power plant operating parameters, Cogeneration systems - heat recovery - energy accumulation. Combustion power plant installations. Fuel supply systems. Boosting the engines.						
Prerequisites and co-requisites	Thermodynamics.. Fluid mechanics						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Test	50.0%			60.0%		
	Project	50.0%			40.0%		

Recommended reading	Basic literature	Balcerski A.: Siłownie okrętowe: podstawy termodynamiki, silniki inapędy główne, urządzenia pomocnicze, instalacje. Wydaw. PG, 1986.2. Górski Z., Giernalczyk M.: Siłownie Okrętowe. Wydaw. AkademiiMorskiej w Gdyni, 2014.3. Skorek J., Kalina J.: Gazowe układy kogeneracyjne. WydawnictwaNaukowo-Techniczne, 2005.4. Babicz J.: Wärtsilä Encyclopedia of Marine Technology.WÄRTSILÄ CORPORATION, 2015.5. Klimstra J., Hotakainen M.: Smart Power Generation: The Futureof Electricity Production. Avain Publishers, 2011.
	Supplementary literature	http://marine.man.eu https://www.wingd.com
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<p>Draw a diagram of a cogeneration power plant with intensive waste heat utilization.</p> <p>Describe the methods of accumulating electrical and thermal energy.</p>	
Work placement	Not applicable	

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