



Subject card

Subject name and code	Modern thermal power plants and hydrogen technologies, PG_00055911						
Field of study	Power Engineering, Power Engineering, Power Engineering						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2024/2025		
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 not applied		
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. Jerzy Gluch					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	15.0	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	2.0		18.0		50
Subject objectives	Broadening students' knowledge about modern thermal power plants and indicating the directions of application of hydrogen technologies in them						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_U06] is able to use the basic knowledge on the operation of energy equipment in the field of thermal power plants, thermal and energy and heating systems, combustion engines, compressors and rotating machines to assess the technical condition of the system	The student is able to apply methods of assessing the technical condition of power plant equipment			[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_W08] has basic knowledge in the field of intellectual property protection and patent law, knows and understands the basic processes of energy production and use, knows and understands the principles of modern heating and power systems	The student is able to determine the principles of using energy systems based on the lawful use of modern methods			[SW2] Assessment of knowledge contained in presentation		
	[K6_W12] has basic knowledge of the life cycle and repairs of energy equipment in the field of thermal power stations, thermal and energy systems and heating systems, internal combustion engines and compressors as well as rotating machines	The student is able to identify modern thermal power plants and the principles of their operation			[SW2] Assessment of knowledge contained in presentation		
Subject contents	Power plants. Introduction to the design of power plants. Introduction to graph theory as applied to the energy evaluation of power plants. Fluid mechanics in the design of drive engines. Designing energy-efficient plants. Application of artificial intelligence methods in the evaluation of the efficiency of power plants. Hydrogen technologies						
Prerequisites and co-requisites	Knowledge of turbine and power plant operation, thermodynamics, fluid mechanics						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	seminary	100.0%	50.0%
	lecture test	60.0%	50.0%
Recommended reading	Basic literature	1. Perycz S, Turbiny parowe i gazowe, Ossolineum, Gdańsk 1989. 2. Traupel W., Thermische Turbomaschinen, Spriger-Verlag 3. Szczeglaev A. W., Parovye turbiny, 4. Janiczek R. S., Eksploatacja elektrowni parowych, WNT, Warszawa 1992. 5. Gundlach W. R., Maszyny przepływowe, T.1-3, PWN, Warszawa 1971. 6. Tuliszka E., Turbiny cieplne, WNT, Warszawa 1973. 7. Tuliszka E., Sprężarki, dmuchawy, wentylatory, WNT, Warszawa 1976. 8. Miller A., Lewandowski J., Siłownie gazowo-parowe, WNT, Warszawa 1999.	
	Supplementary literature	Chmielniak T, Chmielniak T. Technologie wodorowe, PWN Warszawa 2020	
	eResources addresses	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed	The influence of the operating parameters of modern thermal power plants on the assessment of effectiveness		
Work placement	Not applicable		