



Subject card

Subject name and code	Construction and design of heat turbines, PG_00055905						
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			9.0		
Learning profile	general academic profile	Assessment form			exam		
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	45.0	30.0	0.0	30.0	0.0	105
	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	105		9.0		111.0	225
Subject objectives	Acquiring basic knowledge about the construction of rotating machines						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[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 recognize the basic structural nodes of heat turbines. Can indicate methods of strength calculations of these nodes. It can show how to properly operate turbines and their components.		[SW3] Assessment of knowledge contained in written work and projects		
	[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 select from the literature data the methods and the necessary values of the parameters of flow calculations. He can draw the right conclusions about strenght and operation.		[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_U08] can design the basic parameters of the selected technology related to energy conversion and select auxiliary devices and evaluate the project in terms of technical and economic		The student is able to indicate the methods of economical operation of heat turbine elements with the aim of not exceeding the strength limits in conditions of high mechanical and thermal loads.		[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject		
Subject contents	Construction of the impellers. Stress analysis of drum and disc rotors. Trigger rotations of folding disc rotors. Rotor balancing. Design of steering discs. Stress analysis of steering discs. Design of rotor blades and their mounts. Vibrations of the blades. Fundamentals of rotor dynamics. Turbine bodies and external glands. Design of radial and thrust bearings						
Prerequisites and co-requisites	Knowledge of heat turbines and their cycles						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	100.0%	25.0%
	Exercise	60.0%	25.0%
	Exam	60.0%	50.0%
Recommended reading	Basic literature	Perycz S., Turbiny parowe i gazowe, Politechnika Gdańska, Skrypt, Gdańsk 1988 Perycz S., Turbiny parowe i gazowe, Maszyny Przepływowe T. 10, Wydawnictwo Instytutu Maszyn Przepływowych PAN, Gdańsk 1992.	
	Supplementary literature	Kosowski K, Introduction to the theory of marine turbines, Wyd. PGDelft University, Gdańsk 2004	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Describe Gruber's method		
Work placement	Not applicable		