

## 。 GDAŃSK UNIVERSITY OF TECHNOLOGY

## 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 2023		Academic year of realisation of subject			2025/2026			
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 none			
Semester of study	6		ECTS credits			9.0			
Learning profile	general academic profile		Assessment form			exam			
Conducting unit	Institute of Energy ->	Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology							
Name and surname	Subject supervisor		dr hab. inż. Jerzy Głuch						
of lecturer (lecturers)	Teachers				-				
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
of instruction	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 classes includ plan	n didactic led in study	Participation in consultation hours		Self-study Self-study		SUM	
	Number of study hours	105		9.0		111.0		225	
Subject objectives	Gaining basic knowledge on Structure design of Turbomachinery								
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 can recognize the basic design nodes of thermal turbines. It can indicate the methods of strength calculations of these nodes. He can show how to properly operate turbines and their components.			[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment			
	[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 can choose methods and necessary values of strength calculation parameters from literature data. He can draw the right conclusions about strength and operation.			[SW1] Assessment of factual knowledge			
	[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 can indicate the methods of operation of thermal turbine components with the aim of not breaking the strength limits under high mechanical and thermal loads.			[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information			

Subject contents							
	Rotor design, strength analysis calculations of drum and disk type rotors. Release rotational speed of disktype rotors. Rotor balancing. Design of nozzle disks, strength analysis calculation of nozzle disks. Rotorblades design and their fixing system on the disks. Strength analysis calculation of rotor blades and theirfixing system. Blades vibrations. Basics of turbine rotors dynamics. Turbine casings. Internal and externalglands. Design of trust and radial bearings						
Prerequisites and co-requisites	Knowledge on thermal turbines and their thermal cycles.						
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade				
	project	100.0%	25.0%				
	exercise test	60.0%	25.0%				
	egzam	60.0%	50.0%				
j		Perycz S., Turbiny parowe i gaz Skrypt,Gdańsk 1988Perycz S., Przepływowe T. 10,Wydawnictv PAN, Gdańsk 1992.	Perycz S., Turbiny parowe i gazowe, Politechnika Gdańska, Skrypt,Gdańsk 1988Perycz S., Turbiny parowe i gazowe, Maszyny Przepływowe T. 10,Wydawnictwo Instytutu Maszyn Przepływowych PAN, Gdańsk 1992.				
	eResources addresses	Kosowski K, Introduction to the theory of marine turbines, Wyd. PGD University, Gdańsk 2004 Adresy na platformie eNauczanie:					
Example issues/	Describe the Gruber's method						
example questions/ tasks being completed							
Work placement	Not applicable	Not applicable					

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