GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Design and operation of drive turbines , PG_00055907		
Field of study	Power Engineering		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
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	assessment
Conducting unit	Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marek Dzida	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	15.0	0.0	0.0	0.0	30

E-learning hours included: 0.0

eNauczanie source addresses:

Moodle ID: 4640 Konstrukcja i eksploatacja turbin napędowych
https://enauczanie.pg.edu.pl/2025/course/view.php?id=4640

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	8.0	37.0	75

Subject objectives

Basic knowledge in the construction and operation of rotating machines

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 indicate the methods of exploitation of the elements of heat turbines with the aim of not exceeding the strength limits in the conditions of high mechanical and thermal loads.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
[K6_W13] has basic knowledge of the operation of energy equipment in the field of thermal power plants, thermal and energy and heating systems, internal combustion engines, compressors and rotating machines, has basic knowledge of the regulation of energy equipment and methods of their selection depending on the needs	The student is able to recognize the basic structural nodes of heat turbines. He can indicate the methods of strength calculations of these nodes. He can show how to properly operate turbines and their components.	[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 is able to indicate the methods of exploitation of the elements of heat turbines with the aim of not exceeding the strength limits in the conditions of high mechanical and thermal loads.	[SU3] Assessment of ability to use knowledge gained from the subject

<table>
<tr><td>Subject contents</td><td>Course content – lecture

Rotor design. Stress analysis of drum and disc rotors. Trigger rotation of foldable disc rotors. Rotor balancing. Designing steering discs. Stress analysis of steering discs. Design of rotor blades and their fastenings. Blade vibrations. Fundamentals of rotor dynamics. Turbine bodies and external glands. Designing radial and thrust bearings

Course content – exercises

Calculations of stresses in rotor disks. Determination of critical rotational speeds for assembled rotor disks. Calculations of blade stresses. Calculation of external seals.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Knowledge of heat turbines and their cycles</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Colloquium for credit from lecture</td><td>50.0%</td><td>60.0%</td></tr>
<tr><td>Colloquium for credit from exercises</td><td>50.0%</td><td>40.0%</td></tr>
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</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. Kosowski K, Introduction to the theory of marine turbines, Wyd. PG Delft University, Gdańsk 2004
2. Leizerovich A. S. "Steam Turbines for Modern Fossil-fuel Power Plants" Inc NetLibrary, 2007;
1. Logan E., Ro R. "Handbook of Turbomachinery" Arizona State University, Marcel Dekker Inc. New York, Basel, 2003;</td></tr>
<tr><td>Supplementary literature</td><td>1. Boyce M. P. "Gas Turbine Engineering Handbook Gulf Professional Publishing an imprint of Butterworth- Heinemann, Boston, Oxford, Auckland, Johannesburg, Melbourne, New Delhi, 2002;

2. Horlock J. H. "Advanced Gas Turbine Cycles An imprint of Elsevier Science, Amsterdam, Boston, Heidelberg, London, New York, Oxford, Paris, San Diego, San Francisco, Singapore, Sydney, Tokyo, 2003;</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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