GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Nuclear power plant turbines, PG_00055909		
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	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Krzysztof Kosowski	
	Teachers	prof. dr hab. inż. Krzysztof Kosowski	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	0.0	0.0	15

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	15	1.0	9.0	25

Subject objectives

Basic knowledge on nuclear power plants: thermodynamical cycles and schema of nuclear plants, parameters of thermodynamical cycles, theory of heat turbomachinery and auxiliary equipment. Characteristic features of nuclear power plant turbines (design, construction, and operational aspects).

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W11] has knowledge of known technologies and non-technical aspects to solve simple engineering tasks in the field of energy systems and devices	Skills in design calculations for thermal turbines and nuclear power plants.	[SW3] Assessment of knowledge contained in written work and projects
[K6_W02] has a basic knowledge of physics (including optics, electricity and magnetism), chemistry, technical thermodynamics, fluid mechanics and general mechanics needed to understand and describe the basic phenomena occurring in devices and systems, energy plants and transmission networks and their environment	Ability to apply fundamental knowledge of thermodynamics, fluid mechanics, and strength of materials to calculations and design analyses of nuclear power plant components.	[SW2] Assessment of knowledge contained in presentation

Subject contents

Course content – lecture

Lectures: thermodynamical fundamentals of steam cycles of classical and nuclear power plants, thermodynamical fundamentals of gas cycles of nuclear power plants, problem of the proper values of the main design parameters of thermodynamical cycles, principles of operation of heat turbomachinery, calculations of thermodynamical cycles and design calculations of turbine stages, problems of the flow of wet steam, problems of erosion and corrosion, principles of control systems of steam nuclear plants, differences between classical and nuclear turbines, examples of modern nuclear power plants and turbines.

Prerequisites and co-requisites

Fundamentals of thermodynamics and fluid flow theory.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
lecture	60.0%	100.0%

Recommended reading	Basic literature	Perycz, S., Steam Turbines of Electric Power Plants, part I, Gdańsk University of Technology, 1986 (in polish) Perycz, S., Steam Turbines of Electric Power Plants, part II, Gdańsk University of Technology, 1986 (in polish) Kosowski, K. ed., Steam and Gas Turbines, Alstom, France, Switzerland, United Kingdom, Poland, 2007
	Supplementary literature	Perycz S., Steam and Gas Turbines, Ossolineum, Wrocław, Warszawa, Kraków, 1992 (in polish)
	eResources addresses	
Example issues/ example questions/ tasks being completed	Design parameters of the thermodynamic cycles of steam nuclear power plants. Design parameters of the thermodynamic cycles of gas nuclear power plants. Problem of the rotor speed of nuclear turbines. Number of cylinders in steam nuclear turbines. Flow of wet steam in turbines. Erosion and corrosion in nuclear turbines.	
Practical activites within the subject	Not applicable	

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