GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Steam and Gas Turbines (WOiO), PG_00042091						
Field of study	Power Engineering, Power Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject	2023/2024			
Education level	first-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery	at the university			
Year of study	3		Language of instruction	English			
Semester of study	6		ECTS credits	4.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jerzy Głuch				
	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		5.0	65.0		100
Subject objectives	gaining knowledge on thermal turbines						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U07] is able to use basic knowledge of fluid flow machines and methods related to their design in an analytical and numerical approach to the preliminary design of an energy installation		
[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		
[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		
[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		
[K6_W06] knows classic and developmental energy technologies, rules for the selection and operation of heat and energy devices and installations, basic principles of energy systems operation, basic issues regarding the reliability of energy devices and diagnostics, environmental effects of energy technologies used, methods of using renewable energy sources		

Subject contents

Basic components of a thermal turbine cycle, Choice of a structure and main cycle parameters. Turbines of power stations and domestic heating power stations. Nuclear power units equipped with steam turbine (main types of nuclear reactors, main thermal cycles, parameters of nuclear power units). Theory of turbine axial stage, blading systems flows, losses components of turbine stage, effects of multistage flows, circumferential and internal power, circumferential and internal efficiency. Principles of choice of basic parameters of stages and groups of stages. Multistage turbines, efficiency and power of multistage turbine, characteristic turbine stages, control stage problems, last stage problems of condensing type turbine. Performance of stages in wet steam regions, efficiency losses, erosion and corrosion problems. Gas turbine blading system cooling. Losses caused by turbine stage cooling. Combustion chambers types.

Prerequisites and co-requisites

basic knowledge in thermodynamics and fluid dynamics

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
lecture	60.0%	50.0%
seminary	100.0%	50.0%

Recommended reading

Basic literature	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.Kosowski K, Ship Turbine Power Plans, Wyd. PG Delft University,Gdańsk 2004Kosowski K, Introduction to the theory of marine turbines, Wyd. PGDelft University, Gdańsk 2004
Supplementary literature	World's technical press
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

Describe losses different from blade losses in turbine stage

Work placement

Not applicable