GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00056107		
Field of study	Mechatronics		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2024/2025
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	Polish
Semester of study	5	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Zakład Maszyn Przepływowych -> Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Krzysztof Kosowski	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	0.0	0.0	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	0.0	0.0	30

Subject objectives

To give fundamentals of turbomachinery (steam and gas turbines, compressors).

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U05] is able to use properly choosen tools to compare design solutions of elements and mechatronics systems according to given application and economic crtierions (e.g. power demand, speed, costs)	Student knows the main design and operational parameters of turbomachinery equipment.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject
[K6_W11] has a basic knowledge about the life cycle of mechatronic systems and objects	Student knows the basic operational characteristics of turbomachinery equipment.	[SW1] Assessment of factual knowledge
[K6_W10] has a basic knowledge about development trends in terms of engineering and technical sciences and scientific disciplines: Mechanical Engineering, Automation, Electronics and Electrical Engineering, adequate for Mechatronics curse	Student knows the types of turbomachinery (steam, gas, water and air turbines, pumps and compressors), and principles of their operation and the main parameters.	[SW1] Assessment of factual knowledge

Subject contents

Thermodynamic cycles of steam turbines, thermodynamic cycles of gas turbines, combined turbine cycles, elements of steam and gas turbine plants, axial turbine stage theory, stage losses and stage efficiency characteristics, multi-stage turbines, principles of radial and axial compressors, characteristics of compressors. Water turbines, principle of operation, the main characteristics. Air turbines, theory and design. Pumps, principle of operation, types and the main parameters.

Prerequisites and co-requisites

fundamental knowledge of thermodynamics and fluid flow dynamics

Assessment methods and criteria

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

Recommended reading

Basic literature	1. Perycz S., Turbiny parowe i gazowe, IMP- Ossolineum. 2. Kosowski K. et al, Steam and Gas Turbines, Alstom 3. Troskolański A. T., Pompy wirowe, WNT
Supplementary literature	Lecture materials
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	1. The main parameters of steam turbine cycle 2. The main design parameters of gas turbine power plants 3. Turbine stages - principle of operation 4. The main design parameters of turbine stages 5. Flows in nozzles 6. Multistage tubines
Work placement	Not applicable