



## 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	Faculty of Ocean 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 chosen tools to compare design solutions of elements and mechatronics systems according to given application and economic criteria (e.g. power demand, speed, costs)	Student knows the main design and operational parameters of turbomachinery equipment.			[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	[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 course	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. Troskoleński A. T., Pompy wirowe, WNT					
	Supplementary literature	Lecture materials					
	eResources addresses	Adresy na platformie eNauczanie:					

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable