



Subject card

Subject name and code	, PG_00056107						
Field of study	Mechatronics						
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		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_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		
	[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_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		
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	
Work placement	Not applicable