



Subject card

Subject name and code	Fluid flow machinery design, PG_00064836						
Field of study	Mechanical Engineering						
Date of commencement of studies	February 2025		Academic year of realisation of subject			2025/2026	
Education level	second-cycle studies		Subject group			Specialty 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	1		Language of instruction			Polish	
Semester of study	2		ECTS credits			5.0	
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		dr inż. Wojciech Włodarski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	15.0	0.0	60
	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	60	11.0		54.0	125	
Subject objectives	The aim of the course is to broaden the knowledge in the field of design, construction, operation and control of turbomachinery used in the power industry.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_W03] demonstrates a well-structured and theoretically grounded knowledge of the key issues in Mechanical Engineering to enable the design and diagnosis of mechanical systems, processes and devices	The student has an in-depth knowledge of the operation of complex mechanical systems and equipment, including process apparatus.			[SW1] Assessment of factual knowledge		
	[K7_K12] is ready for fulfilling social commitment and initiation of actions for public interest including entrepreneurial thinking and acting	The student is able to combine the description and evaluation of system and non-technical aspects when solving engineering tasks in the field of design, technology and operation of machines.			[SK5] Assessment of ability to solve problems that arise in practice		
	[K7_U04] creatively designs or modifies devices, processes or systems specific to Mechanics and Mechanical Engineering, using computer-aided design systems in the form of technical documentation, taking into account aspects of economic analysis, using appropriate tools and techniques	The student assesses the suitability and correctly selects the methods and tools best suited to solve engineering tasks typical for the specialisation being pursued.			[SU2] Assessment of ability to analyse information		
	[K7_U13] evaluates the feasibility and potential for utilizing new technical and technological achievements in accomplishing tasks characteristic for the field of study	The student assesses the suitability and correctly selects the methods and tools best suited to solve engineering tasks typical for the specialisation being pursued.			[SU1] Assessment of task fulfilment		

Subject contents	Classification of turbomachinery devices. Steam turbines, gas turbines, wind turbines, pumps, compressors and fans. The principle of work, construction, design solutions, operation and control of selected types of turbomachinery devices. Strength analysis of rotors. Fundamentals of rotor dynamics. Design of steering and rotor blades and their mountings. Vibration of the blades. Design of journal and thrust bearings. Turbine housings and external glands. The use of numerical methods in the design of turbomachinery devices.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
Recommended reading	Basic literature	<p>Ryszard Maroński Siłownie wiatrowe Oficyna Wydawnicza Politechniki Warszawskiej 2016</p> <p>Wacław Jagodziński Silniki wiatrowe Państwowe Wydawnictwo Techniczne 1959</p> <p>Stefan Perycz Turbiny parowe i gazowe Wydawnictwo Politechniki Gdańskiej 1988</p> <p>Krzysztof Kosowski Steam and gas turbines Alstom 2007</p> <p>Zygryd Domachowski Regulacja automatyczna turbozespołów ciepłych Wydawnictwo Politechniki Gdańskiej 2011</p> <p>Edmund Tuliszka Sprężarki, dmuchawy i wentylatory Wydawnictwo Naukowo Techniczne 1976</p> <p>Mieczysław Stępniewski Pompy Wydawnictwo Naukowo Techniczne 1985</p>	
	Supplementary literature	Zdzisław Rytł "Zarys maszyn ciepłych" Państwowe Wydawnictwo Naukowe Warszawa 1970	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Design problems of the rotor blade of the last stage of a steam turbine		
Work placement	Not applicable		

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