GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fluid flow machinery design, PG_00064836		
Field of study	Mechanical Engineering		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2026/2027
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	Division of Fluid-Flow Machinery -> Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology -> Wydziały Politechniki Gdańskiej		
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_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
[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_K12] is ready for fullfiling social commitement and initation 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_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

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: 51.0% / Percentage of the final grade: 100.0%
Recommended reading	Basic literature	Ryszard Maroński Siłownie wiatrowe Oficyna Wydawnicza Politechniki Warszawskiej 2016 Wacław Jagodziński Silniki wiatrowe Państwowe Wydawnictwo Techniczne 1959 Stefan Perycz Turbiny parowe i gazowe Wydawnictwo Politechniki Gdańskiej 1988 Krzysztof Kosowski Steam and gas turbines Alstom 2007 Zygfryd Domachowski Regulacja automatyczna turbozespołów cieplnych Wydawnictwo Politechniki Gdańskiej 2011 Edmund Tuliszka Sprężarki, dmuchawy i wentylatory Wydawnictwo Naukowo Techniczne 1976 Mieczysław Stępniewski Pompy Wydawnictwo Naukowo Techniczne 1985
	Supplementary literature	Zdzisław Rytl "Zarys maszyn cieplnych" Państwowe Wydawnictwo Naukowe Warszawa 1970
	eResources addresses	
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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