GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fluid flow machinery design, PG_00057455		
Field of study	Mechanical Engineering		
Date of commencement of studies	February 2022	Academic year of realisation of subject	2022/2023
Education level	second-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Part-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		
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	20.0	10.0	0.0	10.0	0.0	40

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	40	10.0	75.0	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] possesses a profound knowledge on thermodynamic processes and their simulation, knows simulation methods and programs aiding the design and operation of power generating machines and process equipment, including renewable energy sources, air conditioning and cooling renewable energy sources, air conditioning and cooling	The student is able to describe and evaluate system and non-technical aspects when solving engineering tasks in the field of design, technology and operation of machines.	[SW1] Assessment of factual knowledge
[K7_U06] when solving engineering problems on design, technology and operation of machines is able to assess and classify typical methods and tools, define systemic and ex-technical aspects using modern calculating methods and design tools or modifying the current ones	The student assesses the usefulness and correctly selects the methods and tools best suited to solving engineering tasks typical for the specialization.	[SU3] Assessment of ability to use knowledge gained from the subject
[K7_U07] is able to perform a preliminary economic analysis of the undertaken engineering actions within the range of design, production and operation of machines and technical devices	The student has in-depth knowledge of the operation of complex mechanical systems and devices, including process apparatus.	[SU1] Assessment of task fulfilment
[K7_W05] possesses profound knowledge on the operation of complex systems and mechanical devices, including process equipment	The student assesses the usefulness and correctly selects the methods and tools best suited to solving engineering tasks typical for the specialization.	[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	Krzysztof Kosowski Steam and gas turbines Alstom 2007
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	