



Subject card

Subject name and code	Compressors and fans (WM), PG_00042107						
Field of study	Power Engineering, Power Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2026/2027		
Education level	first-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	4	Language of instruction			Polish		
Semester of study	7	ECTS credits			4.0		
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 -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marian Piwowarski					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	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		5.0		65.0	100
Subject objectives	Presentation of the theoretical foundations, principles of operation and construction of compressors and fans. Analysis of selected problems of design and operating these machines.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W13] has basic knowledge of the operation of energy equipment in the field of thermal power plants, thermal and energy and heating systems, internal combustion engines, compressors and rotating machines, has basic knowledge of the regulation of energy equipment and methods of their selection depending on the needs	The student is able to use theoretical knowledge of simple energy systems to design and operate its components components	[SW1] Assessment of factual knowledge
	[K6_W09] knows the dangers of electrical devices and the principles of protection against them, has basic knowledge of heat exchangers, has basic knowledge of power equipment such as pumps, compressors, turbines, combustion engines, boilers, pipelines and their accessories and methods of their selection depending on the needs	The student acquires knowledge of energy equipment such as pumps, compressors, fans, piping and their accessories and methods of selecting them according to needs	[SW1] Assessment of factual knowledge
	[K6_U08] can design the basic parameters of the selected technology related to energy conversion and select auxiliary devices and evaluate the project in terms of technical and economic	Student applies the theory of thermal machines (thermodynamics, fluid mechanics) to describe the real process. The student explains the principles of operation of compressors and fans. Analyzes and evaluates the construction of these machines.	[SU2] Assessment of ability to analyse information
	[K6_U06] is able to use the basic knowledge on the operation of energy equipment in the field of thermal power plants, thermal and energy and heating systems, combustion engines, compressors and rotating machines to assess the technical condition of the system	The student plans basic maintenance of compressors and fans. Carries out measurements, develops and analyses results of measurements of these machines	[SU4] Assessment of ability to use methods and tools
Subject contents	Course content – lecture Division and discussion of types of compressors, blowers and fans. Construction and principle of operation of blowers and fans. Construction and principle of operation of flow compressors. The theory of a single radial stage. Theory of a single axial stage. Computational methods of compressors and fans. Characteristics and control methods. Operational issues.		
Prerequisites and co-requisites	-		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Colloquium	50.0%	75.0%
	Executed reports	100.0%	25.0%
Recommended reading	Basic literature	1.Walczak J. Promieniowe sprężarki, dmuchawy i wentylatory, Wydawnictwo Politechniki Poznańskiej, Poznań, 2013r; 2.Witkowski A. Sprężarki wirnikowe, Wydawnictwo Politechniki Śląskiej, Gliwice, 2013;	
	Supplementary literature	1.Eckert B. Sprężarki osiowe i promieniowe, PWT, Warszawa, 1959r; 2.Fortuna S. Wentylatory, Wydawnictwo TECHWENT, Kraków, 1999r; 3.Hanlon P.C. Compressor handbook, McGraw-Hill Companies, Inc, NY, 2001r;	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Discuss ways to adjust compressors without changing the characteristics. Why do radial compressors realize higher compressions than axial compressors?		
Practical activities within the subject	Not applicable		

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