GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Usable Ventilation and Air-conditioning, PG_00039898		
Field of study	Mechanical Engineering, Mechanical Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
Education level	first-cycle studies	Subject group	Optional 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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Rafał Andrzejczyk	
	Teachers	dr hab. inż. Rafał Andrzejczyk dr inż. Maciej Wierzbowski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	15.0	0.0	0.0	0.0	45

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	45	3.0	2.0	50

Subject objectives

Enhancing knowledge on topics not covered by the thermodynamics course. Getting the skills to solving theoretical and analytical as well as design and operation problems from the selected ventilation and air-conditioning issues and advanced energy conversion technologies.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W09] possesses basic knowledge within the range of thermodynamics and fluid mechanics, construction and operation of heat generating devices, process equipment, including renewable energy sources, cooling and air conditioning	Presents and describes issues related to theoretical and technical solutions for domestic / industrial ventilation and air conditioning. He explains the economical use of energy sources and ways to protect the natural environment and work in the HVAC industry.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[K6_U03] is able to identify, formulate and develop the documentation of a simple design or technological task, including the description of the results of this task in Polish or in a foreign language and to present the results using computer software or other aiding tools	Presents operational issues related to technical solutions for ventilation and air-conditioning. Explains the economical use of energy sources and ways to protect the environment.	[SU2] Assessment of ability to analyse information [SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject

Subject contents

Ventilation. Ventilation main unit. Ventilation systems of industrial spaces. Protection of the work area against hazards related to the emission of pollutants. Methods of calculating supply and exhaust streams. Designing a ducts. Equipment selection. The importance and application of air conditioning. Comfort air conditioning. Industrial air conditioning. Moist air. Calculation of the thermal load of objects - heat gains and losses. The necessary amount of supply air (including fresh air). Examples of air conditioning systems solutions. Energy demand in air conditioning systems. The problem of systems operation.

Prerequisites and co-requisites

Knowledge of Thermodynamics, Fluid Mechanics

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written test	56.0%	75.0%
	Calculation/project task	56.0%	25.0%
Recommended reading	Basic literature	1. M. Malicki Wentylacja i klimatyzacja. Warszawa 2. M. Jaskólski, Z. Micewicz - Wentylacja i klimatyzacja hal krytych pływalni. IPPU MASTA, Gdańsk 3. T. Szymański, W. Wasiluk, Systemy wentylacji przemysłowej. Skrypt Politechnika Gdańska	
	Supplementary literature	1. H. Recknagel Poradnik Ogrzewanie, klimatyzacja. EWFE, Gdańsk	
	eResources addresses	Adresy na platformie eNauczanie: Wentylacja i klimatyzacja użytkowa, W, MiBM, sem.06, letni 22/23 - Moodle ID: 29848 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29848 Wentylacja i klimatyzacja użytkowa, W, MiBM, sem.06, letni 22/23 - Moodle ID: 29848 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29848	
Example issues/ example questions/ tasks being completed	Classify air conditioning systems. Classify ventilation systems. Describe the design process ventilation and air conditioning systems. Present a method of determining energy consumption in systems ventilation and air conditioning.		
Work placement	Not applicable		