GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Residential ventilation and air conditioning systems, PG_00064752		
Field of study	Power 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	4.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Sanitary Engineering -> Faculty of Civil and Environmental Engineering -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Sylwia Fudala-Książek	
	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	7.0	33.0	100

Subject objectives

The aim of the course is to familiarise the student with basic knowledge of ventilation and air-conditioning and the shaping of the indoor environment, current legal regulations and standards relating to the subject, installation materials and criteria for their selection, design methodologies, methods and technologies for the execution of the installations in question, as well as related non-technical considerations.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W03] demonstrates structured and theory supported knowledge encompassing key issues in the field of Power Engineering, enabling design of energy systems, machines and devices, transmission grids and internal installations	The student possesses knowledge covering issues in the field of Power Engineering which enables him/her to design power engineering systems, machines and equipment, transmission networks and internal installations He/she is able to use tools supporting power engineering design.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
[K7_U04] creatively designs or modifies, either entirely or at least in part, energy systems, machines and devices, transmission grids and internal installations, considering both technical and non-technical aspects, estimating costs and utilizing design techniques appropriate for tasks within the scope of Power Engineering	The student designs or modifies, in whole or at least in part, energy systems, machines and equipment, transmission networks or internal installations according to a given specification, taking into account technical and non-technical aspects. The student is able to carry out an economic analysis of the designed solutions, estimating costs and using design techniques appropriate to the tasks in power engineering.	[SU5] Assessment of ability to present the results of task [SU1] Assessment of task fulfilment

<table>
<tr><td>Subject contents</td><td>LECTURES: Ventilation airflow and its properties. Organisation of room air exchange, air distribution in ventilated rooms. Characteristics of ventilation and air conditioning systems. Air treatment. Air recirculation and heat recovery. Mechanical ventilation and air conditioning system components ducts, fittings and equipment. Ventilation and air conditioning units. Dimensioning of mechanical ventilation duct networks. Basics of acoustics. Legal regulations, standards, technical, construction and fire requirements.
EXERCISES: Calculations related to the change of parameters of the humid air condition and practical use of the hx (Mollier) diagram. Calculation of external and internal heat and moisture gains. Methods for the determination of ventilation air volume flows. DESIGN: Design of a mechanical supply and extract ventilation system for a set of rooms in a building. Ventilation air balance. Application of the principles of ventilation air distribution and selection of supply and extract air diffusers. Duct dimensioning. Selection of fittings and equipment. Calculation of pressure drops. Guidelines for preparing project documentation.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Knowledge of the basics of ventilation and air conditioning. Ability to draw in AutoCAD. Knowledge of subjects including: physics, thermodynamics, microbiology, chemistry, heating, ventilation and air conditioning.</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>project task</td><td>60.0%</td><td>40.0%</td></tr>
<tr><td>calculation exercises</td><td>60.0%</td><td>20.0%</td></tr>
<tr><td>final colloquium</td><td>60.0%</td><td>40.0%</td></tr>
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</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. Jaskólski M., Micewicz Z.: Wentylacja i klimatyzacja hal krytych pływalni. IPPU MASTA, Gdańsk, 2000. 2. Klinke T.: Wentylacja. Tablice do obliczeń strat ciśnienia. OWPW, Warszawa, 2007. 3. Pełech A.: Wentylacja i klimatyzacja. Podstawy. Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław, 2009. 4. Szymański W., Wolańczyk F.: Termodynamika powietrza wilgotnego. Przykłady i zadania, OWPRz, Rzeszów, 2008. 5. Przepisy prawne: http:// isap.sejm.gov.pl/, normy związane z tematem, warunki techniczne COBRTI Instal. 6. Malicki M.: Wentylacja i klimatyzacja. PWN Warszawa 1980 5. Jones W.P.: Klimatyzacja. ARKADY. Warszawa 2001</td></tr>
<tr><td>Supplementary literature</td><td>1. Gutkowski K.M., Butrymowicz D.J.: Chłodnictwo i klimatyzacja, WNT, Warszawa, 2007. 2. Rosiński M.: Odzyskiwanie ciepła w wybranych technologiach inżynierii środowiska. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2008. 3. Recknagel, Sprenger i in., Poradnik. Ogrzewanie i klimatyzacja. EWFE, Gdańsk, 2008. 4. Żarski K.: Termodynamika. Zagadnienia praktyczne w ogrzewnictwie i klimatyzacji. Ośrodek Informacji Technika instalacyjna w budownictwie, Warszawa, 2005. 5. Wytyczne producentów, karty katalogowe armatury i urządzeń</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. Determination of humid air parameters on a Mollier chart.

2. Determination of air distribution for specific rooms.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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