GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00061956		
Field of study	Environmental Engineering		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	second-cycle studies	Subject group	Obligatory subject group 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	4.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Sanitary Engineering -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Sylwia Fudala-Książek	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	10.0	10.0	0.0	10.0	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	6.0	70.0	106

Subject objectives

The aim of the course is to introduce the subject of mechanical ventilation and air conditioning. In particular, with the knowledge of ventilation and air conditioning and the shaping of the indoor environment, the basics of acoustics, current legal regulations and standards related to the subject, installation materials and criteria for their selection, design methods and tools supporting design, 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_U03	The student produces design documentation for a mechanical ventilation system, including technical description, calculations and drawings.	[SU1] Assessment of task fulfilment
K7_U10	The student designs a mechanical ventilation system in a public building.	[SU1] Assessment of task fulfilment
[K7_W11] has knowledge to analyze, evaluate and optimize processes, objects and systems of environmental engineering and knows the principles of rational energy management and resources	The student is able to use concepts and specialist language in the field of ventilation and air-conditioning. The student is able to carry out technical and economic analysis of selected mechanical ventilation solutions. They will be able to determine the rational source of heat and cold.	[SW1] Assessment of factual knowledge
K7_W06	The student lists and defines the concepts of media flow in sanitary, thermal or energy systems. Characterises methods and equipment for media flow in sanitary, thermal or energy systems, including mechanical ventilation.	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Course content – lecture

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 ventilation air treatment processes, determination of external and internal heat and moisture gains. Determination of volume flows and ventilation air parameters. Dimensioning and selection of ventilation system components.DESIGN: Design of a mechanical supply and exhaust ventilation system for a set of rooms in a building. Ventilation air balance. Application of the principles of ventilation air distribution and selection of diffusers and extractors. Duct dimensioning. Selection of fittings and equipment. Calculation of pressure drops and control of air volume flows. Design documentation guidelines.</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 the subject Ventilation and Air Conditioning in a first degree engineering course. Basic knowledge of hydraulics and fluid mechanics and thermodynamics.</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>Lecture</td><td>60.0%</td><td>40.0%</td></tr>
<tr><td>Project</td><td>60.0%</td><td>40.0%</td></tr>
<tr><td>Exercises</td><td>60.0%</td><td>20.0%</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. Malicki M., Wentylacja i klimatyzacja. PWN, Warszawa 1980.

4. Pełech A., Wentylacja i klimatyzacja. Podstawy. Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław, 2009.

5. Legal regulations, Polish and European standards related to the subject, technical conditions of COBRTI Instal.</td></tr>
<tr><td>Supplementary literature</td><td>1. Gaziński i in., Technika klimatyzacyjna dla praktyków. Systherm Serwis, Poznań, 2005.

2. Gutkowski K.M., Butrymowicz D.J., Chłodnictwo i klimatyzacja. WNT, Warszawa, 2007.

3. Rosiński M., Odzyskiwanie ciepła w wybranych technologiach inżynierii środowiska. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2008.

4. Recknagel, Sprenger i in., Poradnik. Ogrzewanie i klimatyzacja. EWFE, Gdańsk, 2008.

5. Manufacturers' guidelines, data sheets for fittings and equipment.</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>Phases of flow discharge from an unshielded diffuser.List the types of air intakes.List the noise control devices in a ventilation system.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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