GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Ventilation and Air Conditioning II, PG_00059950
Field of study	Environmental Engineering

Date of commencement of studies	February 2024	Academic year of realisation of subject	2024/2025
Education level	second-cycle studies	Subject group	Obligatory subject group 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	3.0
Learning profile	general academic profile	Assessment form	assessment

Conducting unit	Department of Sanitary Engineering -> Faculty of Civil and Environmental Engineering

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	15.0	0.0	15.0	15.0	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	5.0	30.0	80

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 shall produce documentation design of a ventilation installation mechanical ventilation, including technical description, calculations and drawings technical description, calculations and drawings.	[SU1] Assessment of task fulfilment
	K7_W06	The student lists and defines the concepts of media flow in sanitary, thermal or energy systems. Characterise methods and equipment for media flow in sanitary, thermal or energy systems, including mechanical ventilation.	[SW1] Assessment of factual knowledge
	[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 a rational source of heat and cold.	[SW1] Assessment of factual knowledge
	K7_U10	The student designs a mechanical ventilation system in a building.	[SU1] Assessment of task fulfilment

Subject contents	
	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. Equipment components of mechanical ventilation and air conditioning systems - ducts, fittings and devices. Ventilation and air conditioning units. Dimensioning of mechanical ventilation duct networks. Basics of acoustics. Legal regulations, standards, technical, construction and fire requirements. **LABORATORIES:** Calculation of 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. Operation of ventilation and air conditioning design programs in the Ventpack environment. **PROJECT:** 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.

Prerequisites and co-requisites	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.

Assessment methods and criteria			
	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture	60.0%	30.0%
	Project	60.0%	40.0%
	Laboratory	60.0%	30.0%

Recommended reading	Basic literature	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. Przepisy prawne, Polskie i Europejskie Normy związane z tematem, warunki techniczne COBRTI Instal.
	Supplementary literature	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. Wytyczne producentów, karty katalogowe armatury i urządzeń.
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	

Work placement	Not applicable