



## Subject card

Subject name and code	Ventilation and Air Conditioning, PG_00043393						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2022/2023		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study 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 polish		
Semester of study	6	ECTS credits			2.0		
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	15.0	0.0	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		20.0	55
Subject objectives	The aim of the course is to introduce the basic knowledge of ventilation and air conditioning types and parameters of humid air and its transformations, design/normative parameters of outdoor and indoor air and shaping the indoor environment, current legal regulations and standards related to the subject.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U15] can make interpretations of measured meteorological parameters, define basic elements characterizing the weather and climate		The student is able to make measurements of outdoor and indoor air along with the interpretation of the results in terms of ventilation and air conditioning transformations.				
	[K6_W09] has ordered, theoretically founded knowledge in the field of water supply, sewage, heating, ventilation and air conditioning, and the principles of shaping the microclimate of rooms; knows legal regulations, standardization issues and recommendations for the design of water supply, sewage, heating and gas networks and installations		The student has knowledge about parameters calculation parameters of outdoor and indoor air, the state of humid air. Student knows ventilation and air conditioning systems. He/she understands air transformations in air handling units, depending on the applied processes.				
Subject contents	LECTURE: Moist air state parameters. Processes of moist air changing. Computational/standard parameters of outside and inside air. Microclimate and thermal comfort in rooms. Outside and inside gains/losses of heat and moisture in rooms. Ventilation and air-conditioning in buildings. Ventilation systems. Selection of ventilation system type. Codes and standards. TUTORIALS: Analytical determination of moist air state parameters and practical application of h-x (Molliers) diagram.						
Prerequisites and co-requisites	No requirements						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Tutorials		60.0%		30.0%		
	Colloquium		60.0%		70.0%		

Recommended reading	Basic literature	<p>1. Jaskólski M., Micewicz Z., Wentylacja i klimatyzacja hal krytych pływalni. IPPU MASTA, Gdańsk, 2000.</p> <p>2. Malicki M., Wentylacja i klimatyzacja. PWN, Warszawa 1980.</p> <p>3. Pelech A., Wentylacja i klimatyzacja. Podstawy. Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław, 2009.</p> <p>4. Szymański W., Wolańczyk F., Termodynamika powietrza wilgotnego. Przykłady i zadania, OWPRz, Rzeszów, 2008.</p> <p>5. Przepisy prawne: <a href="http://isap.sejm.gov.pl/">http://isap.sejm.gov.pl/</a> , normy związane z tematem, warunki techniczne COBRTI Instal.</p>
	Supplementary literature	<p>1. Recknagel, Sprenger i in., Poradnik. Ogrzewanie i klimatyzacja. EWFE, Gdańsk, 2008.</p> <p>2. Żarski K., Termodynamika. Zagadnienia praktyczne w ogrzewnictwie i klimatyzacji. Ośrodek Informacji Technika instalacyjna w budownictwie, Warszawa, 2005.</p> <p>3. Wytyczne producentów, karty katalogowe armatury i urządzeń.</p> <p>4. Venture Industries Sp. z o. o. Wentylacja i Klimatyzacja. Materiały pomocnicze do projektowania</p>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	