



Subject card

Subject name and code	Meteorology and Climatology, PG_00042808						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2020/2021		
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	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 Hydraulic Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Dariusz Gąsiorowski					
	Teachers	dr inż. Natalia Gietka					
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 Adresy na platformie eNauczenie:						
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		35.0	85
Subject objectives	Understanding a basic knowledge in the field of meteorology and climatology at the level necessary for the environmental engineering specialist. Understanding of basic concepts related to the composition and properties of the atmosphere. Understanding of basic physical processes taking place in the atmosphere, such as the circulation of heat and humidity in the atmosphere, water's changes of state, moisture and cloud formation, precipitation formation, general atmosphere circulation and local circulation. Acquiring basic skills in the field of reading and observing meteorological elements.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W01] has knowledge in the field of mathematics, including: linear algebra, mathematical analysis and elements of mathematical statistics, probability theory, applications of mathematics, including mathematical methods and numerical methods, necessary for: 1) description and analysis of hydrological phenomena; 2) description and analysis of meteorological phenomena; 3) solving project tasks of the sanitary industry;	Student is able to carry out calculations related to the determination of basic meteorological parameters.	[SW3] Assessment of knowledge contained in written work and projects
	[K6_W12] knows the theoretical basis of the general atmosphere circulation, radiation processes, thermodynamics of the atmosphere, physical properties of atmospheric air and climate-forming processes	The student masters the basic knowledge of meteorology and climatology at the level necessary for the environmental engineering specialist. The student understands at the basic level the concepts related to the circulation of water and energy in the atmosphere. The student understands the influence of the thermodynamic state of the atmosphere on the spread of pollutants. The student understands at the basic level the concepts related to the circulation of water and energy in the atmosphere. The student understands the influence of the thermodynamic state of the atmosphere on the spread of pollutants.	[SW1] Assessment of factual knowledge
[K6_U15] can make interpretations of measured meteorological parameters, define basic elements characterizing the weather and climate	Student is able to use data sets in the field of meteorology and climatology to analyze environmental engineering problems.	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information	
Subject contents	Subject, development and tasks of meteorology. The weather and its typical elements. Measurements and meteorological observations. Atmosphere. The chemical composition and vertical structure of the atmosphere. Water and atmospheric aerosol. The quantities that determine the physical state of the atmosphere. The importance of the shape and motion of the Earth in the physical processes taking place in the atmosphere and on the surface of the Earth. Radiation of the Sun, Earth and atmosphere. Processes of absorbing, diffusing and reflecting radiation in the atmosphere. Thermal balance of the atmosphere and the Earth. Adiabatic processes, vertical temperature gradient and vertical balance of the atmosphere. Water in the atmosphere. The water vapor in the atmosphere. Condensation of water vapor. Conditions for the creation of particular types of clouds. Fogs and atmospheric precipitation. Air pressure. Vertical and horizontal pressure gradient. Typical barometric systems. Atmosphere dynamics. Geostrophic and gradient wind. Global atmosphere circulation. Local winds - breeze and fen. Westerlies and monsoons. Extreme phenomena: storms, tornadoes and hurricanes. Air masses, their types, characteristics. Atmospheric fronts - classification, properties, types of weather accompanying the passage of fronts. The formation and development of low- and high-pressure systems. The main causes of weather changes. Methods of meteorological forecasting. Factors shaping the climate. The main types of climates. Climates of the world, Europe and Poland.		
Prerequisites and co-requisites	Knowledge in mathematics, physics.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Tutorial test	60.0%	40.0%
	Homework	50.0%	30.0%
	Lecture test	60.0%	30.0%
Recommended reading	Basic literature	1. Lutgens F. K. and Tarbuck E. J.: The Atmosphere. Prentice Hall, New Jersey 2004.	
	Supplementary literature	1. Holton J. R.: An Introduction to Dynamic Meteorology. Elsevier, Amsterdam 2004.	
	eResources addresses		
Example issues/ example questions/ tasks being completed			

Work placement	Not applicable
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