



Subject card

Subject name and code	, PG_00059053						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2024/2025		
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	Part-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	4	ECTS credits			6.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Geotechnical and Hydraulic Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Dariusz Gąsiorowski					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	20.0	0.0	0.0	0.0	40
	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	40		6.0		104.0	150
Subject objectives	<p>Understanding a basic knowledge in the field of meteorology and hydrology at the level necessary for the environmental engineering specialist. Understanding of basic physical processes taking place in the atmosphere, such as the circulation of heat and humidity, moisture and cloud formation, precipitation formation, general atmosphere circulation.</p> <p>Understanding the basic hydrological processes occurring in the land phase of the cycle. Understanding the mechanisms of formation of the outflow from the catchment area, water flow in openchannels and in the ground.</p>						

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;	The student is able to perform calculations related to the determination of the basic meteorological and hydrological parameters.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
	[K6_W14] knows and understands the methods of measuring basic quantities characteristic for fluid mechanics and hydraulics, hydrology; knows the calculation methods and IT tools necessary to analyze the results of laboratory and field work	The student knows the rules for preparing hydrological studies and knows the available computational tools supporting the work of an engineer.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
	[K6_U08] can use properly selected methods and devices of hydraulics and hydrology, enabling determination of basic quantities characterizing the flow of water in open channels and rivers, pipelines and flow objects of environmental engineering	The student is able to choose the appropriate method and tools to determine the necessary parameters characterizing the surface and subsurface flows.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU5] Assessment of ability to present the results of task
	K6_W12	The student gains the basic knowledge about meteorology and hydrology. The student understands the basic concepts related to the circulation of water and energy in the atmosphere and hydrosphere. The student understands the influence of the thermodynamic state of the atmosphere on the spread of pollutants.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[K6_U15] can make interpretations of measured meteorological parameters, define basic elements characterizing the weather and climate	The student is able to use the data in the field of meteorology and hydrology to analyze the problems in environmental engineering.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information	
Subject contents	Tasks of meteorology. The weather and its typical elements. Measurements and meteorological observations. Atmosphere. The vertical structure of the atmosphere. The quantities that determine the physical state of the atmosphere. Thermal balance of the atmosphere and the Earth. The water vapor in the atmosphere. Condensation of water vapor. Atmospheric precipitation. Air pressure. Vertical and horizontal pressure gradient. Atmosphere dynamics. Global atmosphere circulation. Air masses. The main causes of weather changes. Methods of meteorological forecasting. Hydrological cycle, the principal processes determining the transport of water. Rainfall. Evaporation. Groundwater, infiltration. Runoff from catchment area, surface flow. Instantaneous Unit Hydrograph. River flow, water stage and discharge and rating curve. Snow melting, transport of the thermal energy in the river and lakes, ice phenomena.		
Prerequisites and co-requisites	Completing a course in mathematics, hydraulics and the basics of computer science.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exam	51.0%	50.0%
	Task reports	60.0%	40.0%
	Test - exercises	51.0%	10.0%

Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Ozga-Zielińska M., Brzeziński J.: Hydrologia stosowana, Wyd.Naukowe PWN, Warszawa, 1994. 2. Byczkowski A.: Hydrologia. SGGW, Warszawa, 1996. 3. Szymkiewicz R., Gąsiorowski D.: Podstawy hydrologii dynamicznej, WNT, Warszawa, 2010. 4. Wołoszyn E.: Meteorologia i klimatologia. Wydawnictwo PG, 2009. 5. Kożuchowski K.: Meteorologia i klimatologia. PWN, Warszawa, 2009. 6. Iribarne H., Cho R.: Fizyka atmosfery. PWN, Warszawa 1988.
	Supplementary literature	1.Lutgens F.K, Tarbuck E.J.: The Atmosphere, Pearson EducationInc., New Jersey, 2005
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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