



Subject card

Subject name and code	Hydrology, meteorology and climatology, PG_00042640						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2021	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	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 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		8.0		104.0	152
Subject objectives	Acquainting with the mechanisms of formation of the outflow from the catchment area, water flow in open channels and in the ground. Learning the concepts related to the structure and properties of the atmosphere and physical processes taking place in the atmosphere, such as: heat and moisture circulation, phase changes, radiation, precipitation, general circulation and circulation of local air masses. Making basic calculations for meteorology and engineering hydrology.						

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 use the data in the field of meteorology and climatology to analyze the problems in environmental engineering.	
	[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 gains the basic knowledge about meteorology and climatology at the level necessary for the environmental engineering specialist. The student understands the basic 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.	
	[K6_W05] knows the theoretical basis of hydromechanics and its practical models, necessary to solve technical problems in the field of environmental engineering (sanitary engineering, water melioration, water management and flood protection, pollution spread)	The student knows the basics of hydromechanics and the governing equations surface and subsurface flows. The student is able to use these equations to solve hydrological problems.	
	[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.	
[K6_W15] 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 computational methods and has a knowledge about the influence of the model parameters on the calculation results. The student understands the role of hydrology in problems related to water management, drainage and flood protection. The student knows rules for preparing hydrological studies. The students know the available computational tools supporting the work of an engineer within the above mentioned fields.		
Subject contents	The hydrological cycle, physical processes that determine water circulation. Water in the ground. Infiltration. Outflow from the catchment area. Surface runoff. The flow in open channels, water levels and flow rate. Flood wave propagation. Chemical composition and vertical structure of the atmosphere. Quantities determining the physical state of the atmosphere. The importance of the shape and movement of the Earth in physical processes taking place in the atmosphere and on the Earth's surface. Processes of absorption, scattering and reflection of radiation in the atmosphere. Heat balance of the atmosphere and the Earth. Evaporation. Quantities characterizing the water vapor content in the atmosphere. Condensation of water vapor. Precipitation. Air pressure - typical barometric systems. Atmospheric dynamics - geostrophic and gradient winds. Global circulation of the atmosphere. Air masses, their types, characteristics, source areas. Factors determining the climate. The main types of climates.		
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
	Test - lecture	60.0%	35.0%
	Homeworks	60.0%	30.0%
	Test - exercises	60.0%	35.0%
Recommended reading	Basic literature	1. Lutgens F.K, Tarbuck E.J.: The Atmosphere, Pearson Education Inc., New Jersey, 2005	
	Supplementary literature	Christopherson R.W.: Geosystems. An Introduction to Physical Geography, Prentice-Hall Inc., New Jersey, 2000.	
	eResources addresses	Adresy na platformie eNauczanie:	

Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none">1. Determination of the average precipitation and excess rainfall.2. Computational task related to the formation of orographic wind.3. Development of the elements of the hydrological study.
Work placement	Not applicable