GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00059053		
Field of study	Environmental Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2023/2024
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	dr hab. inż. Dariusz Gąsiorowski	

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	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, percipitation fromation, general atmosphere circulation. 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.

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 hydrology to analyze the problems in environmental engineering.	[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
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.	[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.	[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[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.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[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.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects

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 termal energy in theriver and lacks, 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
Test - exercises	51.0%	10.0%
Task reports	60.0%	40.0%
Exam	51.0%	50.0%

Recommended reading	Basic literature	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	