



Subject card

Subject name and code	Hydrogeology, PG_00048011						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group			Optional subject group 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	4	Language of instruction			Polish		
Semester of study	8	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Geotechnical and Hydraulic Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Małgorzata Pruszkowska-Caceres					
	Teachers	dr inż. Marzena Wójcik dr hab. Małgorzata Pruszkowska-Caceres					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	10.0	0.0	0.0	0.0	25
	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	25	5.0		70.0	100	
Subject objectives	To familiarize student with the mechanisms of formation and movement of groundwater, with the possibilities of groundwater exploitation and with potential risks of contamination.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W04] possesses elementary knowledge in the field of land mechanics, ground science, land reclamation and geotechnics; has basic knowledge about the composition of air, water and soil, environmental pollution and processes responsible for their formation and ways to reduce them, knows the principles and organization of sustainable water management	Student is able to obtain information from hydrogeological gross-sections and maps and to interpret well pumping tests.	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation
	[K6_W06] has a structured and theoretically founded knowledge in the field of computer science, numerical methods and the possibilities of their applications for solving tasks, description of phenomena related to the flow of water in the environment, in open pipes and channels, filtration, migration of pollutants	Student is familiar with basic computational method and tools for solution of groundwater flow problems. Student is familiar with basic mechanisms of groundwater contamination and with basic principles of assessing groundwater resources.	[SW1] Assessment of factual knowledge
	[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	Student is familiar with mechanisms of groundwater formation and movement	[SW1] Assessment of factual knowledge
	[K6_W13] understands processes shaping the surface of the Earth and processes leading to the formation of deposits of mineral, rock and fossil fuels; understands the water cycle in nature, the mechanisms of formation of groundwater resources; has a structured and theoretically founded knowledge in the field of geology, hydrogeology, and hydrology	Student describes internal and external geological processes; explains natural geological threats; interprets the influence of geological processes on the Earth's relief, surface hazards and water cycle.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
	[K6_U04] can recognize basic rocks and minerals, can create and read maps and geological and hydrogeological sections; can read and interpret geological documentation	Student is able to create and analyze hydrogeological maps and cross-sections	[SU1] Assessment of task fulfilment
	[K6_U15] can make interpretations of measured meteorological parameters, define basic elements characterizing the weather and climate	Student is able to obtain meteorological data and make their interpretation.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
Subject contents	Lecture Groundwater in hydrogeological cycle. Groundwater occurrence, origin and age. Hydrogeological properties of soils and rocks. Groundwater flow. Groundwater chemistry. Groundwater contamination. Measurements and monitoring in groundwater. Management of groundwater resources. TUTORIALS Investigation of hydrogeological conditions on the basis of drilling results. Estimation of hydrogeological parameters based on soil granulometric curve. Interpretation of the results of steady state test pumpings. Interpretation of chemical groundwater analyses. Analysis of hydrogeological maps. Dewatering of an excavation. Evaluation test.		
Prerequisites and co-requisites	knowledge of mathematics, basic hydrology and geology		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Evaluation test for tutorials	60.0%	25.0%
	Average note for projects	60.0%	25.0%
	Evaluation test for lectures	60.0%	50.0%
Recommended reading	Basic literature	- Pazdro Z., Kozerski B. Hydrogeologia ogólna Wyd. Geol. Warszawa 1990 - Wieczysty A., Hydrogeologia Inżynierska, PWN, Warszawa 1982 - Macioszczyk A., Dobrzyński D., Hydrogeochemia, PWN, Warszawa 2002	
	Supplementary literature	- Domenico P.A., Schwartz F.W., Physical and chemical hydrogeology, Wiley, 1998 - Chelmicki W., Woda Zasoby, degradacja, ochrona, PWN Warszawa 2002.	

	eResources addresses	Adresy na platformie eNauczenie: Hydrogeologia - Moodle ID: 36276 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36276
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> - List the factors influencing the intensity of groundwater recharge by infiltration - Give examples of sources of groundwater contamination - Draw a hydrogeological cross-section based on drilling data - Describe hydrogeological conditions for a given site, based on hydrogeological map 	
Work placement	Not applicable	