



## Subject card

Subject name and code	Hydrogeology, PG_00042890						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2021/2022		
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	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Adam Szymkiewicz				
	Teachers		dr inż. Maria Przewłocka, doc. PG  dr inż. Marzena Wójcik  prof. dr hab. inż. Adam Szymkiewicz  dr inż. Anna Gumuła-Kawęcka				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	15.0	0.0	60
	E-learning hours included: 0.0						
	Adresy na platformie eNauczanie:						
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	60		5.0		45.0	110
Subject objectives	Familiarizing students with basics of groundwater (occurence, flow dynamics, chemical composition, possibilites of usage).						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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 can draw and analyze hydrogeological maps and cross-sections	[SU1] Assessment of task fulfilment
	[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 knows the basic calculation methods and tools for groundwater flow	[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 knows the mechanisms of formation and flow of groundwater	[SW1] Assessment of factual knowledge
	[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 knows the basic processes leading to groundwater contamination	[SW1] Assessment of factual knowledge
Subject contents	Origin and occurrence of groundwater. Hydrogeological properties of soils and rocks. Flow in saturated and unsaturated zones, groundwater flow systems. Groundwater abstraction, well hydraulics, dewatering. Chemistry and contamination of groundwater.		
Prerequisites and co-requisites	basic math (differential and integral calculus), basic chemistry		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Evaluation of exercises and projects	55.0%	50.0%
	Exam	55.0%	50.0%
Recommended reading	Basic literature	Pazdro Z., Kozerski B. Hydrogeologia ogólna Wyd. Geol. Warszawa 1990	
	Supplementary literature	Wieczysty A., Hydrogeologia Inżynierska, PWN, Warszawa 1982  Domenico P.A., Schwartz F.W., Physical and chemical hydrogeology, Wiley, 1998	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Estimation of hydraulic permeability based on soil granulometry  Design of excavation dewatering  Interpretation of chemical analyses of groundwater samples		
Work placement	Not applicable		