

Code	III.8.
Course Title (English)	Earth Science and Hydrology
Course Title (Polish)	Podstawy hydrologii i nauk o Ziemi
Credits	2 ECTS

Language of instruction **English**

Compulsory for Profile: Computer Modelling and Simulation (CMS), Intelligent Energy (IE), Biotechnology for Environmental Protection (BI), Business and Technology (BT)

Type of studies BSc studies

Unit running the programme Faculty of Environmental Protection and Engineering
Institute of Environmental Engineering

Course coordinator and academic teachers **Krystyna Malińska PhD**
Krystyna Malińska PhD

Form of classes and number of hours

Semester	Lec.	Tut.	Lab.	Proj.	Sem.	Credit points
III	30			-	-	2

Learning outcomes Understanding of geocosystem functioning; understanding the processes and principles determining the water cycle in the environment.

Prerequisites The basic knowledge of geology, hydrogeochemistry, geophysics, thermodynamics, geomorphology, water processes, physical geography.

Course description **LECTURES:**
Earth sciences in natural science. History of the Earth. Geological structure of the Earth. Geophysical information sources of the Earth's interior. Factors shaping the land surface: truncation, rivers, winds and glaciers activity. The World Ocean. Hydrogeology, engineering geology, mineral deposits geology, natural sources of energy. Influence of geological conditions on the environment. The hydrological cycle as a physical system. Elements of the hydrological cycle: precipitation, evaporation, evapotranspiration, transpiration, infiltration, surface runoff, subsurface flow, groundwater discharge, retention. Evaluation of high tides typical for controlled rivers. Typical states. Analysis of high and low water stages. Storage reservoirs – utility and fire-protection capacity. Methods of moving/spreading hydrological information to uncontrolled places. Mathematical modelling of hydrological processes. Algorithm of the mathematical model. Hydrological systems – their properties and relations. Models of hydrological systems.

Models of drainage basins under anthropological influence. Identification and verification of hydrological models. Statistical and genetic methods of hydrological phenomena forecasting.

specific discharge of aquifer and a well, the calculation of the average precipitation, drainage basin management, analysis of high and low water stages, stream profile, evaluation of the discharge, rating curve, duration curve of water stages, flow-duration curve, mass curve, groundwater table measurement.

the sieve analysis, evaluation of the soil humidity, evaluation of the soil hydraulic conductivity and intrinsic permeability, the computation of the flow rate of groundwater, dynamic and kinematic viscosity.

Form of assessment Exam

- Basic reference materials*
1. Kruseman G.P., De Ridder N.A.: Analysis and Evaluation of Pumping Test Data, International Institute for Land Reclamation and Improvement, Wageningen, 1991.
 2. Soliman M.M., Lamoreaux J.W., Lamoreaux P.E., Assaad F.A., Memon B.A.: Environmental Hydrogeology, Lewis Pub, December 1997.
 3. Nonner J.C.: Introduction to Hydrogeology, Swets & Zeitlinger, March 2003.

Other reference materials

For Polish-speaking students:

1. Pazdro Z., Kozerski B.: Hydrogeologia ogólna. Wydawnictwa Geologiczne, Warszawa 1990.
2. Pazdro Z.: Hydrogeologia ogólna. Wydawnictwa Geologiczne, Warszawa 1977.
3. Rózkowski A., Kleczkowski A.S. (red.): Słownik hydrogeologiczny. Ministerstwo Ochrony Środowiska, Zasobów Naturalnych i Leśnictwa, Wydawnictwo TRIO, Warszawa 1997.
4. Kowalski J.: „Hydrogeologia z podstawami geologii”. PWN, Warszawa 1987.
5. Myślińska E.: Laboratoryjne badania gruntów. Wydanie III uzupełnione. Wydawnictwo Naukowe PWN, Warszawa 2001.
6. Rogoż M.: Dynamika wód podziemnych. Główny Instytut Górnictwa, Katowice, 2007.
7. Wiczysty A.: Hydrogeologia inżynierska, PWN, Warszawa, 1982.
8. Bajkiewicz-Grabowska E., Mikulski Z.: Hydrologia ogólna. Wydawnictwo Naukowe PWN, Warszawa, 1993.
9. Bajkiewicz-Grabowska i in.: Poradnik do ćwiczeń z hydrologii ogólnej. PWN, Warszawa, 1987.
10. Dawydow L.K. i in.: Hydrologia Ogólna. PWN, Warszawa, 1979.
11. Knapp B.J.: Elementy geograficzne hydrologii. PWN, Warszawa, 1986.
12. Lambor J.: Hydrologia Inżynierska. Arkady, Warszawa, 1971.
13. Soczyńska U.: Procesy hydrologiczne. PWN, Warszawa, 1989.
14. Szymkiewicz R.: Hydrologia. Skrypt Politechniki Gdańskiej, 1990.

e-mail of the course coordinator and academic teachers	kmalinska@is.pcz.czest.pl
Average student workload (teaching hours + individ.)	
Remarks:	
<i>Updated on:</i>	<i>04.04.2012</i>