University of Gdańsk

Subject card

Subject name and code	Essentials of Hydrogeology - laboratory classes, PG_00201417						
Field of study	Water Management and Protection of Water Resources						
Date of commencement of studies	October 2027		Academic year of realisation of subject	2027/2028			
Education level	Bachelor's studies		Subject group	Obligatory subject group in the field of study Subject group related to practical vocational preparation			
Mode of study	full-time studies		Mode of delivery	at the university			
Year of study	1		Language of instruction	Polish			
Semester of study	2		ECTS credits	2.0			
Learning profile	practical		Assessment form	credit			
Conducting unit	Department of Hydrology -> Faculty of Oceanography and Geography -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Izabela Chlost				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	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	30		1.0		19.0	50
Subject objectives	Ability to graphically present, analyze and interpret hydrogeological data (cross-sections, groundwater fluctuations, chemistry), calculate effective infiltration and the share of groundwater in river recharge.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GWOZWL3-W02] the importance of advanced knowledge in the sciences allowing to understand the processes and phenomena occurring in the hydrosphere, as well as knowledge of the social sciences and of the Earth's geographic environment - as a system of interrelated and interacting components.	knows and understands the processes and phenomena of the hydrosphere as a system of interconnected and interacting components, is able to identify and characterize the role of groundwater in this system.	[SW3] text preparation/written work
	[GWOZWL3-W04] research techniques, methods and tools currently used in water management and the protection of water resources, in both the natural and social sciences, including basic statistical and IT tools enabling the description, modelling and interpretation of data concerning phenomena and processes occurring in the aquatic environment, as well as tools for describing relationships within socio-ecological systems.	Characterise the physical and hydrogeological properties of groundwater and methods for its protection.	[SW3] text preparation/written work
	[GWOZWL3-W01] in advanced basic biological, physical and chemical processes and phenomena, as well as analyzes their mutual relations and course in relation to natural environment and socio-ecological systems.	Describes and applies methods and techniques used to analyse the hydrogeological environment and groundwater chemistry and groundwater movement.	[SW3] text preparation/written work
	[GWOZWL3-U07] use literature and other available sources of information, including information technology, multimedia, Internet, databases, and select and critically evaluate information.	Knows where to look for and how to use hydrogeological databases, is able to process this data using available tools and interpret it.	[SU3] text preparation/written work
	[GWOZWL3-K05] take responsibility for the safety of his own work and that of others, dealing with emergencies, exercising caution in the laboratory and in the field, responsibility for entrusted equipment and apparatus.	Can take independent action and organise his/her own work and that of a team.	[SK3] text preparation/written work
	[GWOZWL3-U03] observe and describe the changes taking place in water management and predict further directions of its development as well as conduct a critical analysis of case studies of problems of water management and protection of water resources in terms of impact on ecological, social and economic systems; natural valorization and assessment of quality of the environment.	Knows and understands the potential threats and sources of groundwater pollution resulting from strong anthropogenic pressure. Assesses the impact of planned investments on the value and quality of groundwater resources	[SU3] text preparation/written work
	[GWOZWL3-K01] act independently and effectively organize own and team work, is ready to critically assess the degree of its advancement and completion of the tasks set.	is aware of the limitations of his/her own knowledge and skills and understands the need for continuous improvement of his/her professional qualifications in the field of value and protection of groundwater resources and the continuous need for personal development	[SK3] text preparation/written work
	[GWOZWL3-K03] systematic further education and professional development, updating and expand his knowledge and skills, understands the limitations of his own knowledge in the context of civilization progress and recognizes authorities in the professional and scientific environment.	Systematically further develop, update and expand his/her knowledge and skills in hydrogeology.	[SK3] text preparation/written work

<table>
<tr><td>Subject contents</td><td>
• Introduction to the analysis of geological maps and cross-sections.
• Hydrogeological cross-section.
• Map of hydroisohips and hydroisobaths.
• Determination of filtration coefficient.
• Analysis of the chemical composition of groundwater.
• Basic calculations of water inflow to the intake.
• Groundwater fluctuations.
• Calculation of groundwater supply to rivers.
• Effective infiltration calculations.
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<tr><td>Prerequisites and co-requisites</td><td>Knowledge of the cause-and-effect stages of the water cycle in nature.</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>credit work</td><td>51.0%</td><td>100.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>
• Chełmicki W., 2002, Water. Resources, degradation, protection. PWN Science Publishing House, Warsaw.
• Kleczkowski, A. S., (ed.), 1984, Groundwater protection, Geol. Publishing House, Warsaw.
• Macioszczyk A., Dobrzyński, 2003. Hydrogeochemistry of groundwater in the active exchange zone. PWN, Warsaw.
• Paczyński B, Sadurski A. (ed.), 2007, Regional hydrogeology of Poland, PIG, Warsaw.
• Pazdro Z., Kozerski B., 1989. General hydrogeology. Geol. Publishing House, Warsaw.
• Płochniewski Z., 1971. Hydrogeology. Geol. Publishing House, Warsaw.
• Hydrogeologist's handbook, ed. Turek S, 1971, Geological Publishing House, Warsaw.
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<tr><td>Supplementary literature</td><td>
• Kozerski B. (ed.), 2007, Gdańsk water-bearing system, Gdańsk University of Technology Publishing House, Gdańsk.
• Pleczyński J., 1981. Renewability of groundwater resources. Geol. Publishing House, Warsaw.
• Hydrogeological dictionary ed. Kleczkowski A., Różkowski A., 1997, TRIO Publishing House.
• Water Law Act of 20 July 2017 (Journal of Laws 2017, item 1566).
• Geological and Mining Law Act of 9 June 2011 (Journal of Laws 2011, item 1290).
• Tomiałojć L., Drabiński A. (ed.), 2005, Environmental aspects of water management, KOP PAN, Wrocław.
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<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>
• Based on the data, develop a hydrogeological cross-section, mark aquifers and drilled and stabilized water levels.
• Calculate renewable resources using the infiltration method for a sample catchment.
• Based on the data, create a map of hydroisohips and hydroisobate.
• Determine the hydrochemical type of the tested groundwater sample, present it graphically, and interpret it.
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<tr><td>Work placement</td><td>Not applicable</td></tr>
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