University of Gdańsk

Subject card

Subject name and code	Underground waters protection - exercises, PG_00091082		
Field of study	Geology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish polish
Semester of study	5	ECTS credits	1.0
Learning profile	academic	Assessment form	credit
Conducting unit	Department of Geophysics -> Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Leszek Łęczyński	
	Teachers		

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	15.0	0.0	0.0	15
	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	15	10.0	10.0	35

Subject objectives	Making analyses of migration of pollutants, designation of a protection zone for water intakes.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GEOLL3_U02] has the skill of analytical and synthetic way of reasoning leading to correct inference based on the results obtained or the facts presented	has the ability to reason analytically and synthetically, leading to correct conclusions based on the results obtained or facts presented in terms of groundwater protection	[SU3] text preparation/written work
[GEOLL3_W07] knows the anthropogenic transformation of the natural environment, including the effects of the exploitation of mineral resources	is familiar with anthropogenic transformation of the natural environment, including the effects of groundwater exploitation	[SW3] text preparation/written work
[GEOLL3_W05] knows the structure and geological development of selected regions in Poland and in the world	knows the structure and geological development of selected regions in Poland and the world in relation to groundwater protection	[SW3] text preparation/written work
[GEOLL3_U06] is able to identify geological objects and combine them with geological processes and anthropogenic environmental transformations	is able to identify geological objects and link them to hydrogeological processes and anthropogenic transformations of the groundwater environment	[SU3] text preparation/written work
[GEOLL3_W02] knows and understands the terminology appropriate in science and natural sciences	knows and understands groundwater-specific terminology	[SW3] text preparation/written work
[GEOLL3_U01] is able to apply basic measurement and analytical techniques in the field and in the laboratory, plans to conduct research and measurements	is able to apply basic measuring and analytical techniques in the field and laboratory, and to plan investigations and measurements in the field of groundwater protection	[SU3] text preparation/written work

Subject contents

Calculation of vertical migration of pollutants in the aeration zone. Delineation by graphic method of the indirect protection zone of a typical groundwater intake. Give a presentation on a selected issue or example of threat and protection of groundwater from pollution.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
credit work	51.0%	100.0%

Recommended reading

Basic literature	Chełmicki W.; 1997, 1999 Deja i wód. Cz. 1, Jakość. Cz.2 Zasoby: Instytut Geografii UJ, Kraków . Chełmicki W., 2002. Woda. Zasoby, degradacja, ochrona, Wyd. Naukowe PWN, Warszawa Kleczkowski S. [et al.]; 1994: Metodyczne podstawy ochrony wód podziemnych. AGH. Kraków Macioszczyk A., Dobrzyński, 2003. Hydrogeochemia wód podziemnych strefy aktywnej wymiany, Wyd. Naukowe PWN, Warszawa Paczyński B, Sadurski A. (red.), 2007. Hydrogeologia regionalna Polski, PIG, Warszawa Pazdro Z., Kozerski B., 1989. Hydrogeologia ogólna, Wyd. Geologiczne, Warszawa Piekarek-Jankowska H., 1994. Zatoka Pucka jako obszar drenażu wód podziemnych, Wyd. Uniwersytetu Gdańskiego
Supplementary literature	Kleczkowski, A. S., (red.), 1984. Ochrona wód podziemnych, Wyd. Geologiczne, Warszawa Kozerski B.(red), 2007. Gdański system wodonośny, Wyd. Politechniki Gdańskiej, Gdańsk Macioszyk A., 1987. Hydrogeochemia, Wyd. Geologiczne, Warszawa Pleczyński J., 1981. Odnawialność zasobów wód podziemnych, Wyd. Geologiczne, Warszawa Kleczkowski A., Różkowski A., 1997. Słownik hydrogeologiczny, Wydawnictwo TRIO Ustawa, Prawo wodne. z dnia 18 lipca 2001 r. (Dz. U. 2001.115.1229)
eResources addresses	

Example issues/ example questions/ tasks being completed

Calculation of vertical migration of pollutants in the aeration zone.

Work placement

Not applicable

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