

Subject card

Subject name and code	Chemistry in Earth Sciences - lecture, PG_00054154						
Field of study	Geology						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
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	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		2.0		
Learning profile	academic		Assessment form		exam		
Conducting unit	Division of Didactics and Popular Science -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Małgorzata Czaja				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	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		15.0		15.0	60
Subject objectives	Deepening chemical knowledge to the extent enabling the description of chemical processes occurring in nature. Shaping thinking leading to understanding the acquired chemical knowledge and using it in various life situations. Developing a sense of responsibility for one's own safety and protection of the natural environment. Instructing students to select and evaluate the acquired information. Supporting self-education skills by acquiring and collecting information from various sources.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GEOLL3_W01] knows and understands the basic natural phenomena and explains their course in relation to geological processes	Is aware of the existence of various natural phenomena and is able to explain them, e.g. knows the processes in which certain chemical substances are transformed into others. Understands chemical equations, the role of catalysts, the principles of conservation of mass and energy.	[SW4] test/exam - oral or written
	[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 describe and interpret chemical processes occurring in nature. Is able to analyze the results of experiments and draw conclusions.	[SU4] test/exam - oral or written
	[GEOLL3_W02] knows and understands the terminology appropriate in science and natural sciences	Has knowledge of specialized terms and concepts used in general chemistry. Knows their definitions and contexts of their use, e.g. acidity, pH, redox reactions, catalyst, chemical equilibrium, molarity.	[SW4] test/exam - oral or written
	[GEOLL3_K03] is willing to exercise caution and criticism in receiving information from scientific literature, the Internet and other media related to natural sciences	Has the ability to read and understand scientific articles, books and other source materials relating to general chemistry.	[SK4] test/exam - oral or written
Subject contents	The interdependence between the properties of a substance and its structure. Matter: elements, chemical compounds, mixtures. Properties of solutions. Energy effects of chemical reactions. The speed of chemical reactions. The state of chemical equilibrium and the rules for determining changes in the equilibrium system. Acids and bases. Interpretation of the pH scale. Equilibrium in aqueous solutions. Oxidation and reduction reactions.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	exam	51.0%	100.0%
Recommended reading	Basic literature	General Chemistry, Loretta Jones, Peter Atkins, Laverman Leroy, Ed. Scientific PWN, Warsaw 2020 General chemistry. Particles, matter, reactions, Jones, P. Atkins, Ed. Naukowe PWN, Warszawa 2004 Basics of inorganic chemistry, A. Bielański, Ed. Scientific PWN, Warsaw 1994	
	Supplementary literature	Short lectures Chemistry for Biologists, Fisher J., Arnold J.R.P., Ed. Naukowe PWN, Warszawa 2008	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Identifying substances as electrolytes or non-electrolytes. Explain the difference between solutions of strong and weak acids and bases. Provide a definition of oxidation and reduction based on the oxidation state and electron transfer. State the difference between exothermic and endothermic reactions in terms of the direction of energy flow and the sign of enthalpy. Explanation of the principle "like dissolves like". State how collision theory and active complex theory explain the dependence of reaction rates on temperature. Interpretation of the energy profile of the reaction. Interpretation of chemical equilibrium. Predicting the impact of changes in conditions on the state of chemical equilibrium. Explain how the pH of a solution is related to the concentration of oxonium and hydroxide ions. Explain why solutions of salts of weak bases are acidic and solutions of salts of weak acids are basic.		
Work placement	Not applicable		

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