University of Gdańsk

Subject card

Subject name and code	Chemistry in Earth Sciences - lecture, PG_00191241		
Field of study	Geology		
Date of commencement of studies	October 2026	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	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	1.0	19.0	50

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_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
[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_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

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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