

**Subject card**

<b>Subject name and code</b>	Hydrochemistry - lecture, PG_00201223						
<b>Field of study</b>	Aquaculture – Business And Technology						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>				2026/2027	
<b>Education level</b>	Bachelor's studies	<b>Subject group</b>				Obligatory subject group in the field of study Subject group related to practical vocational preparation	
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>				at the university	
<b>Year of study</b>	1	<b>Language of instruction</b>				Polish	
<b>Semester of study</b>	1	<b>ECTS credits</b>				3.0	
<b>Learning profile</b>	practical	<b>Assessment form</b>				exam	
<b>Conducting unit</b>							
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr Aleksandra Brodecka-Goluch				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	45.0	0.0	0.0	0.0	0.0	45
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	45		2.0		28.0	75
<b>Subject objectives</b>	Presenting basic concepts and terms in the field of hydrochemistry. Providing the ability to classify water based on chemical indicators of water quality.						
<b>Learning outcomes</b>	<b>Course outcome</b>		<b>Subject outcome</b>			<b>Method of verification</b>	
	[AKWAL3_W02] has an advanced understanding of chemical, biological, physical processes and phenomena, identifies them, analyses their mechanisms in relation to the aquatic environment, and is aware of the connections between various natural disciplines		knows and understands chemical processes and phenomena, identifies and analyzes them in hydrochemistry.			[SW4] test/exam - oral or written	

Subject contents	<p>A.1. Basic analytical concepts in hydrochemistry. Units of measurement used, precision, accuracy;</p> <p>A.2. A modern model of the structure of the atom. Basic compounds: oxides, hydrides, acids, hydroxides, salts. Regularities recorded in the periodic table.</p> <p>A.3. Correlation between the type of chemical bond and the properties of the substance;</p> <p>A4. Dispersion systems, mixtures, solutions, colloids;</p> <p>A.5. Equilibrium in electrolyte solutions (properties of acids, bases and electrolyte solutions; discussion and interpretation of the pH scale);</p> <p>A.6. Hydrogen and oxygen and water - its structure and physical properties;</p> <p>A.7. Methods of collecting and testing the chemical composition of water samples, collection programs;</p> <p>A.8. Physical and chemical properties of water - water in aquaculture;</p> <p>A.9. Methods of presenting the chemical composition of water and hydrochemical classifications of water;</p> <p>A.10. Inorganic and organic substances in natural waters and their transformations.</p> <p>A.11. Biogeochemical cycles of carbon, nitrogen, phosphorus, silicon and selected metals, e.g. Fe (forms of occurrence and processes occurring in the atmosphere, biosphere, sea water and sediments; influence of oxygen conditions on the course of cycles; changes in the circulation of elements caused by human activity);</p> <p>A.12. Carbonate balance, alkalinity and pH.</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written test	51.0%	100.0%
Recommended reading	Basic literature	<p>Dojlido J., 1995. Chemistry of surface waters, Ed. Economy and Environment, Białystok, 342. Macioszczyk A., 1987. Hydrogeochemistry, Ed. Geol., Warsaw, 475.</p>	
	Supplementary literature	<p>Kajak Z., 1998. Hydrobiologia Limnologia, PWN, Warszawa, 336. Namieśnik J., Łukasiak J., Jamrógiewicz Z., 1995. Taking environmental samples for analyses, PWN, Warszawa, 280. Minczewski J., Marczenko Z., 2011. Analytical chemistry. Chemical methods of quantitative analysis, Vol. 2, PWN Brodecka-Goluch A. (ed.), 2023, Physicochemical research on natural waters, Ed. University of Gdańsk, Gdańsk, 170. Bielański A. General and inorganic chemistry, PWN, Warsaw</p>	
	eResources addresses		

<p>Example issues/ example questions/ tasks being completed</p>	<p>Explain the periodicity of the physical and chemical properties of elements in the periodic table. Explain the concept of strong electrolyte, weak electrolyte, give examples of strong acids and strong bases. Define the term colloid, give examples of colloidal systems in nature. Explain the concept of hydration and solvation. Define when we talk about a covalent, covalent-polar, ionic bond. Give examples of compounds in which such bonds occur. For what purposes are water samples taken for analysis, what rules should be followed when taking water samples and what should you pay attention to when collecting them. What basic physicochemical parameters are most often measured/studied as part of standard monitoring programs. Discuss how water samples should be collected and preserved for analysis of biogenic salts, dissolved oxygen and pH. What is ion balance and what is it used for? Discuss the nitrogen/phosphorus/carbon biogeochemical cycle. How do oxygen conditions affect the course of these cycles? What determines the rate of inflow of organic matter into sediments in water reservoirs and what influences the rate of degradation of organic matter in water reservoirs? Discuss how pH affects carbonate balance.</p>
<p>Work placement</p>	<p>Not applicable</p>

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