

Subject card

Subject name and code	General Chemistry, PG_00188253						
Field of study	Chemia ogólna (Wykład)						
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 Subject group related to scientific research 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 N/A		
Semester of study	1		ECTS credits		3.0		
Learning profile	academic		Assessment form		exam		
Conducting unit	Laboratory of Intermolecular Interactions -> Department of Bioinorganic Chemistry -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Sandra Brzeska				
	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		10.0		35.0	75
Subject objectives	To provide students with a solid theoretical foundation in general chemistry, essential for understanding the structure of matter, the properties of elements and chemical compounds, and the transformations they undergo. To develop skills in interpreting the atomic and molecular structure of substances in the context of their physical and chemical properties, and to apply identification methods used in forensic analysis. To prepare students for the understanding and practical application of basic chemical concepts, such as chemical equilibria, acid-base properties, redox processes, reaction kinetics, and solution properties, as a foundation for the analysis of chemical traces. To foster awareness of the role of chemistry as a fundamental science in forensic science, particularly the importance of the chemical properties of substances for their detection, preservation, and identification in laboratory and field practice.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[AKRL3_W01] The graduate knows and understands, at an advanced level, the laws and theories in the field of chemistry, as well as the basics of biology, mathematics and law constituting general knowledge in the scientific disciplines forming the theoretical foundations relevant to the study program.		The student knows and understands advanced principles and theories of chemistry, as well as basic principles and theories of biology, mathematics, and law, providing the general knowledge necessary to understand theoretical foundations relevant to the study program.		[SW4] test/egzamin - ustny lub pisemny [SW5] realizacja zadania problemowego		
	[AKRL3_K01] The graduate is ready to critically evaluate their own knowledge, understand its importance for solving cognitive and practical problems, and to seek expert opinions when necessary.		The student is able to critically assess their own knowledge, appreciate its relevance in solving theoretical and practical problems, and, when justified, seek expert opinions to support decision-making.		[SK1] wypowiedź ustna/rozmowa/ dyskusja [SK4] test/egzamin - ustny lub pisemny		

Subject contents	Lecture topics: atomistic theory of the structure of matter (atomic nucleus, isotopes, electronic structure of atoms, quantum numbers, atomic orbitals), elements of radiochemistry, chemical equations, elements of stoichiometry, periodic table of elements, high-energy chemical bonds (ionic, atomic, coordination) and low-energy bonds (hydrogen bonds, van der Waals forces), theory of valence bonds, hybridization, solutions, elements of chemical thermodynamics - thermochemistry, classification of traces using general chemistry methods, structure of matter and identification of selected substances analyzed in forensics, chemical kinetics and equilibrium, electrolytic dissociation, properties of electrolyte solutions, theories of acids and bases, properties of acid and base solutions, amphotericity of substances, pH scale, pH of aqueous solutions of strong acids and bases, equilibria in aqueous solutions of electrolytes (pH of solutions of weak acids, bases, their mixtures with strong acids and bases, buffer solutions, ionic hydrolysis, solubility product), chemical equilibria in evidence analysis, electrochemistry (oxidation and reduction processes, electrodes, galvanic cells, normal potential series, electrolysis), redox reactions in forensics.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written exam covering the topics mentioned in the lecture program content	51.0%	100.0%
Recommended reading	Basic literature	1. A. Bielański "Chemia ogólna i nieorganiczna" 2. J. D. Lee - "Zwięzła chemia nieorganiczna" 3. L. Jones, P. Atkins "Chemia ogólna"	
	Supplementary literature	1. J. Amiel "Chemia ogólna" 2. F.A. Cotton, G. Wilkinson, P.L. Gaus "Chemia nieorganiczna"	
	eResources addresses		
Example issues/ example questions/ tasks being completed	N/A		
Work placement	Not applicable		

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