

**Subject card**

Subject name and code	Diploma lecture - Solution chemistry, PG_00081848						
Field of study	Chemistry						
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 Optional subject group	
Mode of study	full-time studies	Mode of delivery				at the university	
Year of study	3	Language of instruction				Polish Polish	
Semester of study	6	ECTS credits				2.0	
Learning profile	academic	Assessment form				credit	
Conducting unit	Laboratory of Physicochemistry of Coordination Complexes -> Department of General and Inorganic Chemistry -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Joanna Makowska				
	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		5.0		15.0	50
Subject objectives	familiarization with the issues mentioned in the program content, in particular with the basic issues of solution chemistry, developing the ability to use chemical terminology and nomenclature, especially regarding processes in solutions, developing the ability to independently solve problems in the field of solution chemistry familiarization with issues related to the chemistry of natural waters and sewage						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[CHEML3_W02] Describes the properties of elements and the most important chemical compounds, enumerates the methods of their preparation and methods of analysis.	It describes at an advanced level the properties of elements and the most important chemical compounds, lists the methods of their preparation and methods of analysis.			[SW4] test/exam - oral or written		
	[CHEML3_W03] Explains the relationship between the structure of matter and its observed properties.	It explains at an advanced level the relationships between the structure of matter and its observed properties.			[SW4] test/exam - oral or written		
	[CHEML3_U08] Presents in an understandable way the basic facts about chemistry using a scientific language typical of chemical sciences.	It presents chemistry facts in an accessible way, using scientific language typical of chemical sciences.			[SU4] test/exam - oral or written		
	[CHEML3_K01] Identifies the level of her/his own knowledge and skills and the need for continuous learning and personal development.	Identifies the level of knowledge and skills, the need for continuous education and personal development.			[SK4] test/exam - oral or written		

Subject contents	water as a specific solvent;classification and characterization of liquid chemical reaction environments;basics of chemistry in non-aqueous environments;acid-base interactions and acid-base equilibria in solutions;hydrogen bonding;chemical equilibria with particular emphasis on equilibria in solutions of complex compounds;Chemistry of natural waters, admixtures and pollutants,carbonate-bicarbonate balance in natural watersSpeciation forms of water pollution; metals and metalloidsProtection and restoration of natural waters, changes in the quality of surface and groundwaterWastewater chemistry, new pollutants: medicines, drugs and microplastics and the risks associated with themTransformations of organic compounds and biogenic substances in the presence of microorganisms; self-cleaning processesAdvanced methods of removing pollutants from water and sewage		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
Recommended reading	Basic literature	brak	
	Supplementary literature	brak	
	eResources addresses		
Example issues/ example questions/ tasks being completed	brak		
Work placement	Not applicable		

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