

Subject card

Subject name and code	Diploma lecture - Analytical aspects of intermolecular interactions, PG_00081845						
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		
Semester of study	6	ECTS credits			2.0		
Learning profile	academic	Assessment form			credit		
Conducting unit	Department of Analytical Chemistry -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Dorota Zarzeczańska				
	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	<ul style="list-style-type: none"> - Acquainting with instrumental and computational techniques for analysis of equilibrium reactions in solution - Ability to select a technique to analyze intermolecular interactions - Ability to write, graphically present and apply chemical programs to describe and analyze intermolecular interactions 						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[CHEML3_W03] Explains the relationship between the structure of matter and its observed properties.	1. Defines and explains the basic concepts of spectroscopy and electrochemistry 2. Selects the analytical technique adequate to the study of a given type of intermolecular interaction.	[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.	Analyzes IR and NMR spectra and performs graphic processing. Calculates acid dissociation constants of compounds based on measurements potentiometric and spectrophotometric. Designs selected organic compounds. Searches for physicochemical properties of tested compounds in available databases	[SU4] test/exam - oral or written
	[CHEML3_W02] Describes the properties of elements and the most important chemical compounds, enumerates the methods of their preparation and methods of analysis.	1. Describes the forces defining intermolecular interactions. 2. Lists the types of intermolecular interactions	[SW4] 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.	Shows cautious criticism in receiving information, especially available in the mass media	[SK1] oral statement/conversation/discussion
Subject contents	Practical design of the synthesis of organic compounds. Preparation of samples for spectroscopic measurements (UV-Vis and CD). Spectroscopic and graphical analysis, IR and NMR spectra processing using appropriate software. Basics of electrochemistry in the study of intermolecular interactions. Calculation of acid dissociation constants based on spectroscopic and potentiometric measurements. Equilibrium modeling based on results obtained from potentiometry or spectroscopy. Kinds of intermolecular interactions and their description by means of quantum chemistry. Searching for available databases, using selected databases to find physicochemical properties of selected organic compounds		
Prerequisites and co-requisites	<p>-Analytical chemistry, physical chemistry</p> <p>-Basic issues in the field of analytical and physical chemistry, the ability to describe the equilibrium in solution with chemical reactions</p>		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	51.0%	100.0%
Recommended reading	Basic literature	A. Cygański, Metody spektroskopowe w chemii analitycznej, WNT, Warszawa 2009 L. Piela Idee chemii kwantowej PWN Warszawa 2003J. Inczedy Równowagi kompleksowania w chemii analitycznej, Warszawa PWN 1979	
	Supplementary literature	J. Polster, H. Lachmann, Spectrometric Titrations: Analysis of Chemical Equilibria, Weinheim; Basel (Switzerland);Cambridge, New York NY	
		J.B. Lambert, H.F. Shurvell, D.A. Lightner, R.G. Cooks, Organic Structural Spectroscopy, Prentice Hall, New Jersey, 1998	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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