

Subject card

Subject name and code	Monographic lecture - Research methods in supramolecular chemistry, PG_00057826						
Field of study	Chemical Business						
Date of commencement of studies	February 2026		Academic year of realisation of subject		2026/2027		
Education level	Master'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	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		3.0		
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		prof. dr hab. inż. Tadeusz Ossowski dr hab. Paweł Niedziałkowski dr Dorota Zarzeczańska				
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		20.0		25.0	75
Subject objectives	introducing students to: current issues of coordination and supramolecular chemistry, evaluation of individual physicochemical methods in terms of molecular recognition, introducing students with spectrophotometric and electrochemical methods used in the study of equilibria in solution, familiarize students with computational methods and modeling of equilibria in solution, developing the ability to select research techniques for characterizing intermolecular interactions						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BCHMU2_W05] Knows and understands the main trends in the development of chemistry combined with economics as two interpenetrating scientific disciplines.	1. Defines coordination and supramolecular systems. 2. Recognizes the relationship between the type of interactions and the thermodynamic and kinetic stability of supramolecular connections. 3. Describes the basic laws and principles of intermolecular interactions.	[SW4] test/exam - oral or written
	[BCHMU2_U01] Is able to, on the basis of her/his knowledge, propose a solution to problems in chemistry, taking into account the economic aspect by using advanced measurement techniques.	1. Uses appropriate physicochemical techniques and methods characterize the properties of supramolecules. 2. Is able to explain the principles of measurement of basic physical quantities and	[SU4] test/exam - oral or written
	[BCHMU2_U02] Is able to define her/his interests, develop them within the chosen direction and in connection with the subject of her/his master's thesis by implementing the process of self-education and planning her/his professional career.	Interprets measurement results obtained during spectrophotometric and electrochemical analysis used in the study of equilibria in solutions.	[SU4] test/exam - oral or written
	[BCHMU2_W01] Knows and understands complex physicochemical processes and is able to analyse their course in connection with other fields of science.	Describes the basic methods used in the physicochemical characterization of equilibria in coordination and supramolecular systems.	[SW4] test/exam - oral or written
	[BCHMU2_K04] Is willing to properly assess the acquired knowledge, respect and disseminate it in order to solve specific cognitive and practical issues.	1. Understands the need to independently search for information in the literature regarding the latest scientific reports. 2. Recognizes the connection between research on supramolecular interactions and the development of modern technologies and medicine	[SK1] oral statement/conversation/discussion [SK4] test/exam - oral or written
Subject contents	Supramolecular chemistry and coordination chemistry. Methods for determining the stoichiometry of interactions and determining equilibrium constants. Review of experimental methods, suitability analysis, measurement techniques. Calorimetric methods, thermodynamic aspects of supramolecular interactions. Extraction methods. Spectroscopic methods: NMR, IR, UV-Vis, MS (measurement and computational techniques). Chromophore systems in supramolecular chemistry. Graphical methods for determining the equilibrium model and computational methods (Henderson-Hasselbach's method, Rosse Drago and others). Electrochemical methods in the study of equilibria: conductometry, potentiometry, voltammetric methods. Methods of testing modified surfaces. Nanotechnology and supramolecular methods		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	final test	51.0%	100.0%
Recommended reading	Basic literature	M. Ciesielska J. Starosta, M. Wasielewski - Wstęp do chemii koordynacyjnej, PWN 2010 H. Dodziuk - Wstęp do chemii supramolekularnej, Wydawnictwo UW 2008 Ch. A. - Analytical Methods In Supramolecular Chemistry, Wiley VCh 2007	
	Supplementary literature	J. Polster, H. Lachman - Spectroscopic Titration, VCH 1986	
	eResources addresses		
	Example issues/ example questions/ tasks being completed		
Work placement	Not applicable		

Document generated electronically. Does not require a seal or signature.