University of Gdańsk

Subject card

Subject name and code	Monographic lecture - Research methods in supramolecular chemistry, PG_00050892		
Field of study	Chemistry		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
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	2	Language of instruction	Polish
Semester of study	3	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	dr Dorota Zarzeczańska dr hab. Paweł Niedziałkowski	

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	40.0	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
[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	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
[CHEMMU2_W05] Has extended knowledge in the field of the specialisation studied.	1. Defines coordination and supramolecular systems. 2. Recognizes the relationship between the type of interactions and the thermodynamic and kinetic stability of supramolecular connections.	[SW4] test/exam - oral or written
[CHEMMU2_W11] Demonstrates general knowledge about the current trends in the development of chemistry as a science and the latest discoveries in this field.	Sees connections between the type of interactions and the thermodynamic and kinetic stability of supramolecular connections.	[SW4] test/exam - oral or written
[CHEMMU2_W01] Uses knowledge of spectroscopic methods of chemical compound analysis.	Describes the basic methods used in the physicochemical characterization of equilibria in coordination and supramolecular systems.	[SW4] 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
three partial tests	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.