University of Gdańsk

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 2026	Academic year of realisation of subject	2028/2029
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

- 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

-Analytical chemistry, physical chemistry

-Basic issues in the field of analytical and physical chemistry, the ability to describe the equilibrium in solution with chemical reactions

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

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