University of Gdańsk

Subject card

Subject name and code	Instrumental analysis, PG_00054397		
Field of study	Chemistry		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	postgraduate studies	Subject group	Obligatory subject group in the field of study
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	3.0
Learning profile	academic	Assessment form	
Conducting unit	Pracownia Chemii i Analityki Kosmetyków -> Katedra Chemii Analitycznej -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Grzegorz Romanowski	
	Teachers	dr hab. Grzegorz Romanowski	

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

acquainting students with the principles of electroanalytical, spectroscopic and chromatographic methods as well as stages of the analyticalprocess, developing skills in basic instrumental analyzes and their statistical evaluation, developing the skills of solving problems by yourself during chemical analysis

Learning outcomes

Course outcome	Subject outcome	Method of verification
[CHEMMU2_U02] Critically assesses the results of conducted, performed observations and theoretical calculations and discusses errors.	1. Is able to interpret results in qualitative and quantitative terms and apply appropriate statistical processing. 2. Is able to describe and knows how to operate the equipment used in the analytical laboratory.	[SU4] test/exam - oral or written
[CHEMMU2_W09] Classifies specialist IT tools used in statistical evaluation of experiment results.	1. Knows what software should be used for measurements and data processing and how to statistically evaluate experimental results.	[SW4] test/exam - oral or written
[CHEMMU2_U04] Applies acquired knowledge of chemistry and related scientific disciplines.	1. Is able to apply basic formulas and chemical laws to calculate the amount of an analyte. 2. Is able to use appropriate analytical methods in a specific experimental technique.	[SU4] test/exam - oral or written
[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 develop one's knowledge and learn newer instrumental techniques. 2. Is aware of the limitations and financial conditions of the selected instrumental method.	[SK4] test/exam - oral or written
[CHEMMU2_W10] Uses knowledge of the principles of operation of the basic scientific and research apparatus used in chemistry.	1. Is able to describe scientific and research equipment used in various instrumental techniques and the principles of its operation. 2. Knows what analytical task a given technique can be used for.	[SW4] test/exam - oral or written
[CHEMMU2_W03] Demonstrates extended knowledge in the field of modern measuring techniques used in chemical analysis.	1. Has knowledge of how to select an analytical method for a specific sample. 2. Knows how to explain the principles of sample preparation for analysis	[SW4] test/exam - oral or written
[CHEMMU2_W02] Has extended and in-depth knowledge in the field of basic chemistry.	1. Knows the basic laws in electroanalytical, spectroscopic and chromatographic techniques. 2. Has knowledge of the structure and principles of operation of the equipment used in the techniques discussed.	[SW4] test/exam - oral or written
[CHEMMU2_W07] Selects experimental and theoretical techniques to the extent necessary to understand the description and modelling of medium complexity chemical processes.	1. Understands the principles of selecting and conducting analyzes using various instrumental techniques. 2. Is able to determine the limitations of using each method.	[SW4] test/exam - oral or written

Subject contents

Stages of the analytical process, analytical measurement methods, preparation of results and their statistical evaluation, spectroscopic methods (UV-Vis, IR, NIR; atomic spectroscopy, X-ray methods), chromatographic methods (gas chromatography, high-performance liquid chromatography, planar chromatography), electroanalytical methods (potentiometry, conductometry, coulometry, polarography, voltammetry, amperometric titration).

Prerequisites and co-requisites

knowledge of chemical methods of qualitative and quantitative analysis

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
exam	51.0%	100.0%

Recommended reading

Basic literature	W. Szczepaniak Metody instrumentalne w analizie chemicznej, PWN, Warszawa A. Cygański Metody spektroskopowe w chemii analitycznej, WNT, Warszawa A. Cygański Podstawy metod elektroanalitycznych, WNT, Warszawa
Supplementary literature	G.W. Ewing Metody instrumentalne w analizie chemicznej, PWN, Warszawa J. Minczewski, Z. Marczenko Chemia analityczna t. III Analiza instrumentalna, PWN, Warszawa D.A. Skoog, D.M. West, F.J. Holler, S.R. Crouch Podstawy chemii analitycznej, PWN, Warszawa J. Garaj Fizyczne i fizykochemiczne metody analizy, WNT, Warszawa
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

Work placement

Not applicable

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