University of Gdańsk

Subject card

Subject name and code	Analytical chemistry, PG_00052418		
Field of study	Chemical Business		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	Bachelor's 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	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	Agata Smułka dr Elżbieta Adamska	

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	45.0	0.0	0.0	45
	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	45	8.0	22.0	75

Subject objectives	acquiring the ability to independently conduct basic analyzes using qualitative and quantitative methods

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BCHINŻ_K04] Demonstrates responsibility for the safety of her/ his own and others' work.	Recognizes and predicts sources of errors in analysis and follows occupational health and safety rules in the laboratory.	[SK8] observation of student's independent or team work
[BCHINŻ_U03] Plans, selects the appropriate research and measuring equipment and performs simple chemical experiments; analyses the results and draws conclusions based on them.	1. plans and supplies laboratory equipment and glassware necessary to perform classical analysis 2. Based on the reactions carried out, identifies and classifies ions into appropriate analytical groups in accordance with the Fresenius and Bunsen taxonomy. 3. Performs alkalimetric, redoximetric, precipitation and complexometric titration determinations as well as gravimetric determinations in accordance with the analytical recipe. 4. Balances the equations of chemical reactions and uses them to calculate the amount of the determined substance.	[SU4] test/exam - oral or written [SU7] entries and opinions in the internship diary [SU8] observation of student's independent or team work
[BCHINŻ_W07] Describes the construction and operating principles of basic scientific, technological and control-measuring apparatus.	describes and can sketch laboratory equipment and glassware necessary to perform classical analysis	[SW4] test/exam - oral or written
[BCHINŻ_U08] Uses the chemical nomenclature and engineering terminology properly.	Appropriately uses chemical nomenclature and engineering terminology typical of analytical chemistry.	[SU4] test/exam - oral or written
[BCHINŻ_W02] Enumerates basic laws and theories in chemistry, physics and mathematics necessary to formulate and solve simple engineering tasks.	1. Gives the composition of group reagents. 2. Explains the principle of operation of group and specific reagents. 3. Defines the basic issues of the theory describing the course of ionic reactions in solution. titration determinations. 4. Illustrates the titration process with an appropriate curve. 5. Illustrates and describes using chemical equations the reactions that occur during qualitative and quantitative determinations. 6. Lists and explains the operation of indicators used in titration determinations.	[SW4] test/exam - oral or written
[BCHINŻ_W10] Applies safety and hygiene principles when working on a test and measurement stand or in the field.	Characterizes the basic principles of health and safety procedures at the analytical laboratory.	[SW4] test/exam - oral or written

Subject contents

Principles of work in the analytical laboratory, qualitative analysis of cations I, IIA and III of the Fresenius analytical groups and mixtures of anions, quantitative analysis of substances in solution (alkacymetry, redoximetry, complexometry, precipitation titration, weight analysis).

Prerequisites and co-requisites

-completed general chemistry course

-using basic laboratory glass and applying the rules of work in a chemical laboratory,writing chemical reactions taking into account the stoichiometry of reactions and determining the products, e.g. sediment, gas, etc., describing chemical equilibrium in the solution using chemical reactions, balancing the oxidation and reduction reactions; calculations based on chemical reactions, calculating molar concentrations, percentages, calculating the pH of electrolytes

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
report	0.0%	7.0%
seven partial tests	51.0%	56.0%
Completion of the practical part of the classes	51.0%	37.0%

Recommended reading	Basic literature	J. Minczewski i Z. Marczenko, Chemia analityczna 1 i 2, PWN Warszawa T. Lipiec, Z.S. Szmal, Chemia analityczna z elementami analizy instrumentalnej, PZWL Warszawa H. Bentkowska, Chemia analityczna jakościowa, skrypt PG A. Cygański, Chemiczne metody analizy ilościowej, WNT A. Persony , Chemia analityczna. Podstawy klasycznej analizy ilościowej, Medyk
	Supplementary literature	D. Harvey, Modern Analytical Chemistry, McGraw Hill Companies, Inc. W. Gorzelany, A. Śliwa, J. Wojciechowska, Półmikroanaliza jakościowa, PWN Warszawa
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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