University of Gdańsk

Subject card

Subject name and code	Analytical chemistry, PG_00052417		
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	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	dr Dorota Zarzeczańska	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	30.0	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	using chemical calculations to determine substances

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BCHINŻ_K04] Demonstrates responsibility for the safety of her/ his own and others' work.	Demonstrates the ability to draw conclusions based on the work done	[SK1] oral statement/conversation/ discussion [SK4] 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. Illustrates the titration process with an appropriate curve. 2. Illustrates and describes using chemical equations the reactions that occur during qualitative and quantitative determinations. 3. Selects a calculation method to determine the amount of a substance in a solution	[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 occupational health and safety in an analytical laboratory.	[SW1] oral statement/ conversation/discussion
[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. Carries out calculations to determine the concentration of ions in a solution, taking into account the presence of several equilibria in the solution. 2. Predicts the course of a reaction in a solution based on the amount and properties of the solute.	[SU4] test/exam - oral or written
[BCHINŻ_W07] Describes the construction and operating principles of basic scientific, technological and control-measuring apparatus.	Recognizes and describes the role of equipment and glass appropriate for qualitative and quantitative analysis.	[SW1] oral statement/ conversation/discussion
[BCHINŻ_U08] Uses the chemical nomenclature and engineering terminology properly.	Correctly recognizes and uses the nomenclature used in analytical chemistry.	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written

Subject contents

Calculation of: ion activity in solution, pH of solutions of substances and mixtures, redox potentials and EMF, oxidation and reduction reaction constant, solubility of precipitates taking into account the influence of ionic strength, protolysis and complexation, ion concentrations in solutions of complexes, titration results and curves (alkacimetric, redoximetric , complexometric and precipitation), errors and losses in quantitative analysis, predicting the direction of oxidation and reduction reactions.

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
activity	0.0%	10.0%
arithmetic mean of two tests	51.0%	90.0%

Recommended reading

Basic literature	Z. Galus, Ćwiczenia rachunkowe z chemii analitycznej, PWN 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.
eResources addresses	

Example issues/ example questions/ tasks being completed

Work placement

Not applicable

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