University of Gdańsk

Subject card

Subject name and code	Analytical chemistry, PG_00048366		
Field of study	Chemistry		
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	dr Dorota Zarzeczańska Kornelia Kozłowska dr Iwona Dąbkowska	

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
	[CHEML3_W08] Demonstrates knowledge of basic computational methods to solve problems in chemistry, physics, mathematics.	Selects the calculation method to determine the amount of substance in the solution.	[SW4] test/exam - oral or written
	[CHEML3_U09] Is able to learn independently.	1. Recognizes the analytical effects of characteristic reactions performed during qualitative 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. Recognizes the end point of the titration.	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work
	[CHEML3_W07] Understands and describes physicochemical patterns, phenomena and processes using the language of mathematics.	1. Explains the principle of operation of group and specific reagents. 2. Defines the basic issues of the theory describing the course of ionic reactions in solution. 3. Illustrates the titration process with an appropriate curve. 4. Illustrates and describes using chemical equations the reactions occurring during qualitative and quantitative determinations. 5. Lists and explains the operation of indicators used in titration determinations.	[SW4] test/exam - oral or written
	[CHEML3_U03] Selects the appropriate equipment and laboratory apparatus for conducting uncomplicated chemical experiments.	Identifies and applies the laboratory glass suitable for qualitative and quantitative analysis	[SU4] test/exam - oral or written [SU8] observation of student's independent or team work
	[CHEML3_K05] Observes established procedures in laboratory work and is responsible for the safety of her/his 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
	[CHEML3_W12] Characterises the basic principles of health and safety at work in a chemical laboratory; knows and describes the hazards associated with working with hazardous substances, ways to counteract these hazards and rules of conduct during an accident.	Characterizes the basic principles of health and safety procedures at the analytical laboratory	[SW1] oral statement/ conversation/discussion
	[CHEML3_U02] Performs analyses using experimental methods and draws conclusions based on them.	Performs alkacymmetric, redoximetric, precipitation and complexometric titrations and weight determination in accordance to the analytical regiments.	[SU2] presentation/project/paper/ report [SU5] implementation of a problem task
	[CHEML3_W04] Characterises the basic methods of chemical compound analysis.	1. Gives the composition of group reagents 2. Describes the division of anions and anions into analytical groups 3. Characterizes the methods of classical quantitative titration and gravity analysis	[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
	seven partial tests	51.0%	56.0%
	Completion of the practical part of the classes	51.0%	37.0%
	report	0.0%	7.0%
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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