GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	General Chemistry I, PG_00069009		
Field of study	Chemia ogólna I		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research 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	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Inorganic Chemistry -> Faculty of Chemistry -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Łukasz Ponikiewski	
	Teachers	dr hab. inż. Łukasz Ponikiewski prof. dr hab. inż. Dariusz Witt dr inż. Olga Ciupak	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	20.0	10.0	30.0	0.0	0.0	60

E-learning hours included: 0.0

eNauczanie source addresses:
Moodle ID: 1333 Chemia ogólna I
https://enauczanie.pg.edu.pl/2025/course/view.php?id=1333

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	60	5.0	60.0	125

Subject objectives

Introduction of students to the fundamentals of inorganic and organic chemistry relevant to cosmetic technologies. The course will cover the structure of matter, chemical bonding, stoichiometry, aqueous solutions and acidbase equilibria, as well as selected elements and their compounds. Students will learn the structure, synthesis, and reactivity of the main functional groups, including alcohols, phenols, ethers, aldehydes, ketones, carboxylic acids and their derivatives, amines, and fragrance compounds containing a carbonyl group.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_K01] understands the need to constantly expand knowledge in line with the latest scientific achievements, develop professional competences and teamwork skills	The student understands the need to systematically expand their basic knowledge of chemistry, follow the latest scientific advances, and develop professional competencies, including teamwork skills in the context of cosmetic technologies.	[SK1] Ocena umiejętności pracy w grupie [SK3] Ocena umiejętności organizacji pracy
[K6_W01] defines the phenomena, processes and physicochemical laws used to produce utility goods and provide services	Students learn basic chemistry and define fundamental physicochemical phenomena, processes, and laws related to the structure of matter, solutions, chemical equilibria, and the reactivity of major functional groups relevant to cosmetic technologies.	[SW1] Ocena wiedzy faktograficznej

Subject contents	Department of Inorganic Chemistry 1. Introduction to inorganic chemistry in cosmetics, structure of matter, chemical bonds, and Lewis structures. 2. Stoichiometry of chemical reactions. 3. Aqueous solutions and their properties. 4. Acids, bases, acid-base equilibrium, buffer solutions. 5. Selected elements and their compounds in cosmetics. Department of Organic Chemistry 1. Obtaining and reactivity: Alcohols; Phenols; Ethers; Aldehydes and ketones; Carboxylic acids and their derivatives; Amines; 2. Fragrance compounds containing carbonyl groups. **Department of Inorganic Chemistry** 1. Basic chemical terminology. 2. Stoichiometry of chemical reactions, reaction efficiency. 3. Solutions: expressing concentrations, conversion, dilution, concentration. 4. Equilibria in electrolyte solutions, strong and weak electrolytes, degree of dissociation, Ostwald's law of dilutions, pH of acid and base solutions. 5. Equilibria in electrolyte solutions, pH calculations of buffers. **Department of Organic Chemistry** 1. Alcohols and ethers. 2. Phenols. 3. Aldehydes and ketones. 4. Carboxylic acids and their derivatives. 5. Amines **Department of Inorganic Chemistry** 1. Preparation of NaOH solutions and titration with a standard HCl solution. Recalculation of concentrations. 2. Obtaining simple salts in the form of solutions and precipitates. Reaction yield. 3. Hydrolysis of salts, determination of the pH of aqueous salt solutions. 4. Preparation of buffers with the appropriate pH, determination of buffer capacity. **Department of Inorganic Chemistry** Students separate mixtures of acidic, neutral, and basic compounds. Purification by distillation or crystallization. Identification of the obtained compounds based on melting or boiling point.
Prerequisites and co-requisites	
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory - detailed reports	50.0%	25.0%
Exercises - quizzes	50.0%	25.0%
Lectures - exam	60.0%	50.0%

Recommended reading	Basic literature	1. A. Bielański "Chemia nieorganiczna", PWN wydania z ostatnich lat; 2. P.A. Cox "Krótkie wykłady, chemia nieorganiczna", PWN 2003; 3. F.A. Cotton, G. Wilkinson, P.L. Gaus "Chemia nieorganiczna, podstawy", PWN 1995 4. " Chemia ogólna i nieorganiczna ćwiczenia rachunkowe, pod redakcją Andrzeja Okuniewskiego, Wydawnictwo Politechniki Gdańskiej.
	Supplementary literature	Not applicable
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Using Lewis structures, write down the formulas of the following chemical compounds: $HClO_2$, Na_2Te_3, CaH_2. For the first two compounds, calculate the formal charge. 2. What are electrolytes? Give an example of a strong electrolyte and a weak electrolyte. Write down the dissociation formulas for the compounds you have given. 3. Give the systematic names of the following compounds: H_2SO_4, H_2SO_3, CuCl, $FePO_4$. 4. Write down the formulas of salts with the following systematic names: copper(II) sulfate(IV), ammonium nitrate(III), potassium chlorate(V), magnesium bromide. 5. Explain what a buffer and buffer capacity are.	
Practical activites within the subject	Not applicable	

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