



INTERNATIONAL EUROPEAN UNIVERSITY

APPROVED

The Head of the admissions committee


PADALKA 14.05.2025



PROGRAM **professional exam in chemistry** **upon admission to study for a bachelor's or master's degree in medicine** **(for foreign citizens)**

General Provisions

The professional entrance examination in Chemistry is conducted in order to assess the level of educational achievements of entrants and to determine the compliance of their chemical knowledge and practical skills with the requirements of medical education programs.

The content of the entrance examination program is based on the secondary school Chemistry curriculum and corresponds to international educational standards necessary for further study in the field of medicine.

The program is structured according to the main branches of chemistry and includes the following sections: **Introduction to Chemistry**, **General Chemistry**, **Inorganic Chemistry**, **Organic Chemistry**, and **Chemistry of Biologically Important Compounds**.

The entrance examination aims to determine whether entrants are able to:

- understand and use basic chemical concepts, laws, theories and terminology;
- explain chemical phenomena and processes relevant to medicine and everyday life;
- analyze chemical reactions and transformations;

- apply chemical knowledge to solving theoretical and practical problems;
- establish relationships between chemical structure, properties and biological effects;
- use chemical knowledge for understanding physiological and biochemical processes in the human body;
- justify conclusions logically and coherently in oral form.

Form of Conduct of the Entrance Examination

The professional entrance examination in Chemistry is conducted **in oral form as an individual interview** with the examination board.

The oral entrance examination includes:

- oral answers to theoretical questions covering the content of the program;
- explanation of chemical laws, concepts and reaction mechanisms;
- analysis of situational and problem-based tasks related to chemistry and medicine;
- demonstration of the ability to apply chemical knowledge to medical and biological contexts.

The duration of the oral entrance examination for one entrant is **up to 30 minutes**.

CONTENT OF THE PROGRAM

Section	Topic	Content
General Chemistry	Matter and Its Structure	Atoms, molecules, ions. Chemical elements and compounds. Atomic structure: protons, neutrons, electrons. Isotopes. Electron shells and energy levels.
General Chemistry	Periodic Law and Periodic Table	Periodic law. Structure of the periodic table. Periodic trends: atomic radius, ionization energy, electronegativity, metallic and non-metallic properties.
General Chemistry	Chemical Bonding	Ionic, covalent (polar and nonpolar), metallic and hydrogen bonds. Valency and oxidation states. Molecular geometry. Intermolecular interactions.

General Chemistry	Chemical Reactions	Types of chemical reactions: synthesis, decomposition, substitution, exchange. Exothermic and endothermic reactions. Oxidation-reduction reactions. Chemical equations and balancing methods.
General Chemistry	Chemical Calculations	Amount of substance. Mole concept. Molar mass. Concentration of solutions. Stoichiometric calculations.
Inorganic Chemistry	Classes of Inorganic Compounds	Oxides, acids, bases and salts. Chemical properties and methods of preparation. Acid-base reactions. Neutralization.
Inorganic Chemistry	Metals and Nonmetals	General properties of metals and nonmetals. Alkali and alkaline earth metals. Halogens and chalcogens. Biological role of metals and nonmetals (Na, K, Ca, Mg, Fe, I, Cl).
Inorganic Chemistry	Solutions	Solubility. Factors affecting solubility. Electrolytes and nonelectrolytes. pH scale. Acids and bases in aqueous solutions.
Organic Chemistry	Introduction to Organic Chemistry	Organic compounds. Carbon atom and its properties. Homologous series. Functional groups. Isomerism.
Organic Chemistry	Hydrocarbons	Alkanes, alkenes, alkynes, aromatic hydrocarbons. Structure, nomenclature, chemical properties and applications.
Organic Chemistry	Oxygen-Containing Organic Compounds	Alcohols, phenols, aldehydes, ketones, carboxylic acids, esters. Chemical properties and biological significance.
Organic Chemistry	Nitrogen-Containing Organic Compounds	Amines, amides, amino acids. Peptide bond. Proteins as organic compounds.
Organic Chemistry	Organic Reactions	Substitution, addition, elimination, oxidation and reduction reactions. Reaction mechanisms (general overview).
Chemistry of Biologically Important Compounds	Biologically Important Substances	Carbohydrates (monosaccharides, disaccharides, polysaccharides). Lipids (fats, phospholipids, steroids). Proteins: structure and functions. Nucleic acids: DNA and RNA. Vitamins and hormones. Water and mineral salts in the human body.

ASSESSMENT CRITERIA FOR ENTRANCE EXAMINATION IN CHEMISTRY

The results of the entrance examination are evaluated on a **100–200 point scale** based on the entrant's performance during the oral interview.

To obtain a positive result, the entrant must score **at least 100 points**, corresponding to not less than **30% of the minimum required level**.

During evaluation, the examination board takes into account:

- correctness and completeness of answers;
- understanding of chemical concepts and laws;
- ability to explain chemical processes and reactions;
- application of chemical knowledge to medical and biological situations;
- logical coherence, clarity and accuracy of oral speech;
- proper use of chemical terminology.

Entrants who score less than **100 points** receive an *unsatisfactory* grade and are not admitted to further participation in the competitive selection.

Responsibility secretary
of the admissions committee

Oksana PUZIK

Head of the selection committee

Iryna Shteimiller

