

**MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE REPUBLIC OF KAZAKHSTAN
KAZAKH NATIONAL PEDAGOGICAL UNIVERSITY NAMED AFTER ABAI**



We train teachers who are able to anticipate the needs of modern education, based on advanced methods, national heritage and global approaches. We are increasing the prestige of the teaching profession and becoming a driver of human capital development

EDUCATIONAL PROGRAM

8D05301 – Chemistry

Department of Chemistry

Almaty

Data on disciplines

№	Name of discipline	Short description of discipline	Cycle	Component	Credits
1	Academic writing	Aim: to instill the skills of composing academic texts. Content: Skills of written presentation of research results. Types of design of academic texts. Concepts, functions and genres of academic texts. Competencies: skills in writing and formatting scientific articles, dissertations and presenting empirical research data.	BD	UC	5
2	Research methods	Goal: mastering modern methods of scientific research in the field of chemistry and teaching methods Content: features and essence of scientific research. Methodological principles of scientific research and modern physical and chemical research methods. Structure and content of the stages of the research process. Methods of preparing a PhD program. Programming the sequence of complex research execution Competence: be ready to apply research methods in the field of chemistry and teaching methods	BD	EC	5
3	Modification of polymers	Introduction to the course of chemical modification of polymers. Intramolecular transformations. The main regularities of the polymer reaction of similar transformations. Reactions of the polymer with the monomer, leading to the formation of the grafted polymer. Polymer reactions with a low molecular weight compound not capable of polymerization or polycondensation under selected conditions. The interaction of the polymer with high molecular modifier. Modification at the stage of polymer synthesis.	PD	EC	5
4	Modern teachings about solutions	Non-electrolyte solutions. Thermodynamics of solutions. The concept of "solution", the concentration of solutions. The chemical potential of the component in ideal solutions. Activity and activity ratio of the component solutions. Molecular structure of solutions. Molecular interaction in solutions, the association of molecules. Electrolyte solutions. Basic concepts of the subject of electrochemistry. The development of ideas about the structure of electrolyte solutions (T. Grotgus, M. Faraday, S. Arrenius, I. A. Kablukov). Causes of electrolytic dissociation.	PD	EC	5
5	Supramolecular chemistry and nanotechnology	Objective: to solve the problems facing modern civilization in conducting research in the field of organic and physical chemistry, molecular biology, biochemistry, biotechnology, as well as related fields, including pharmaceuticals and nanotechnology. Contents: Ideas about modern concepts of theoretical supramolecular chemistry, about the principles of design and functioning of synthetic receptors, supermolecules and supramolecular systems, about modern methods of synthesis of organic compounds, the main ways of practical use of supramolecular systems in nanotechnology.	PD	EC	5