KAZAKH NATIONAL WOMEN'S TEACHER TRAINING UNIVERSITY
INSTITUTE OF NATURAL SCIENCES
8D01503-CHEMISTRY
Catalog of elective disciplines

CONTENT

KAZAKH NATIONAL WOMEN'S TEACHER TRAINING UNIVERSITY
INSTITUTE OF NATURAL SCIENCES
8D01503-CHEMISTRY
Catalog of elective disciplines

1. OPTIONAL COMPONENT OF THE CYCLE OF CORE COURSES

Optional component 1

Course: Methodology for the application of physical and chemical research in scientific projects of students
Intensity of the Course: 5 academic credits
Module Code: ChTM 702/1
Module Name: Chemistry Teaching Methodology
Prerequisites: no
Purpose: teach how to choose a rational approach to determining the structure of compounds based on chemical and physicochemical research methods.
Short Description: During the course, the skills of applying the results of complex physical and chemical studies in solving problems of professional activity, including in the project activity of students using digital knowledge, are formed. The course is aimed at developing the ability to design, implement and adapt modern achievements in chemistry into the educational process, implement analytical and technological solutions in the field of experimental and theoretical chemistry and education.
Learning Outcomes in EP (LOP):
LOP 1 – systematization of knowledge containing the fundamental laws underlying physical and chemical analysis;
LOP 2 – establishing the scope and boundaries of various methods;
LOP 3 – developing skills in working with information databases (spectral, X-ray diffraction and chromatographic);
LOP 4 – developing skills in the use of physical and chemical methods in modern scientific research;
LOP 5 – capable of developing and implementing project activities in the field of chemistry within the framework of scientific research.
Post requisites: Doctoral student's research work

Optional component 1

Course: Digital technologies in education and scientific research
Intensity of the Course: 5 academic credits
Module Code: ChTM 702/2
Module Name: Chemistry Teaching Methodology
Prerequisites: no
Purpose: The main goal of the discipline is the use of digital technologies in the educational process (including in design work), complex physical and chemical research and professional activities.
Short Description:
The application of modern digital technologies in the educational process (including design work), complex physical and chemical research and in professional activities is considered.
Develops skills in developing various options for solving educational, research and practical problems in the field of chemistry and pedagogical science using digital knowledge, forming the ability to choose the best methods of scientific research.
Learning Outcomes in EP (LOP):
LOP 3 – applies the results of complex physical and chemical research in solving problems of professional activity, including in the project activities of students using digital knowledge.
LOP 4 – offers alternative solutions to educational, research and practical problems in the field of chemistry, has the ability to select optimal methods of scientific research;
Learning Outcomes in Course (LOC):
LOC 1 – the ability to demonstrate the ability and willingness to apply acquired knowledge in practice when solving professional problems;
LOC 2 – knowledge of the main trends in the use of digital technologies in modern science and education;
LOC 3 – demonstration of the ability and readiness to apply acquired knowledge in practice when solving professional problems;
LOC 4 – ability to use modern computer technologies necessary for organizing scientific research;
LOC 5 – mastering modern computer technologies used in processing the results of scientific experiments;
LOC 6 – knowledge of methods for processing experimental data using software packages.
Postrequisites: Doctoral student's research work

2. OPTIONAL COMPONENT OF THE CYCLE OF MAJOR COURSES

Optional component 1

Course: Methodological aspects of teaching analytical chemistry

Intensity of the Course: 5 academic credits
Module Code: ChTM 703/1
Module Name: Chemistry Teaching Methodology
Prerequisites: no

Purpose: formation of theoretical methodological competence of analytical chemistry and readiness to conduct pedagogical research, the ability to understand the relationship between science and practice in the field of pedagogy, theory and methodology of teaching and education.

Short Description: The course examines the methodological aspects of teaching analytical chemistry and develops the ability to analyze and introduce modern aspects of chemical analysis into the educational process, implement analytical and technological solutions in the field of chemical education, diagnose scientific problems and solve existing problems based on theory and empirics in the system of scientific research and logic in field of analytical chemistry.

Learning Outcomes in EP (LOP):

LOP2 – diagnoses scientific problems and solutions to existing problems based on theoretical analysis and empirical research, systematizing the logic and methods of scientific research;

LOP 6 – able to design, implement and adapt modern aspects of chemistry into the educational process, implements analytical and technological solutions in the field of experimental and theoretical chemistry and chemical education.

Learning Outcomes in Course (LOC):

LOC 1 – familiarization of doctoral students with modern methods of identifying, distributing and analyzing the latest achievements of analytical chemistry;

LOC 2 – give a holistic understanding of the doctoral student's production area and the analysis methods used for a quick and holistic assessment of the content of chemicals in the emergency zone, as well as for eco-analytical monitoring of environmental objects.

Post-requirements: NIRD Research work of a doctoral student

Optional component 1

Course: Actual problems of teaching organic chemistry at the university
Module Code: ChTM 703/2
Module Name: Chemistry Teaching Methodology
Prerequisites: no

Purpose: development of ideas about the structure and properties of organic compounds, their practical significance.

Short Description: The discipline considers topical problems of teaching organic chemistry and directs to the analysis and search for alternative solutions to educational, research and practical problems in the field of organic chemistry, to the development of the ability to introduce and adapt modern scientific achievements of organic chemistry into the educational process. implementing technological solutions in the field of theoretical and practical organic chemistry and education.

Learning Outcomes in EP (LOP):

LOP 4 – offers alternative solutions to educational, research and practical problems in the field of chemistry, has the ability to select optimal methods of scientific research;

LOP 6 – Able to design, implement and adapt modern aspects of chemistry into the educational process, implements analytical and technological solutions in the field of experimental and theoretical chemistry and chemical education.

Learning Outcomes in Course (LOC):

LOC 1 – the subject of organic chemistry of cyclic compounds, the formation of a clear idea of its connection with other sciences and the practical application of organic compounds in various fields of human activity;

LOC 2 – uses the fundamentals of theory and methodology in modeling and designing the education system;

LOC 3 – developing a clear idea of the place and role of organic chemistry in teaching chemistry courses in the general education system.

Post requisites: DSRW Doctoral student research work, including internship and doctoral dissertation