NJSC SHAKARIM UNIVERSITY OF SEMEY

EDUCATIONAL PROGRAM

7M01 - Pedagogical sciences
(Code and classification of the field of education)

7M015 - Teacher training in natural science subjects
(Code and classification of the direction of training)

0114
(Code in the International Standard Classification of Education)

M013 - Preparation of teachers of chemistry (kazakh, russian, english language)
(Code and classification of the educational program group)

7M01504 - Chemistry
(Code and name of the educational program)

Master
(Level of preparation)

Semey

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Master
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Semey 2023

PREFACE

Developed

The educational program 7M01504 - Chemistry in the direction of preparation 7M015 - Teacher training in natural science subjects on the basis of the State Compulsory Standards of Higher and Postgraduate Education approved by the Order of the Ministry of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 No 2 (as amended by the order) was developed by the Academic Committee dated 20.02.2023 No 66).

Members of the Academic Committee	Full name	Academic degree, academic title, position	Signature
Head of the Academic Committee	Mukayev Zhandos	Dean of the Faculty of Natural Sciences and Mathematics, PhD	
Educational program manager	Ontagarova Dinar	Natural sciences are scientific subjects senior teacher of the department,candidate of pedagogic sciences	
Member of the AC	Nurekenova Aigyl	Associate Professor (Associate Professor) of the Department of Natural Sciences, candidate of biological sciences	
Member of the AC	Sharipkhan Dinara	Municipal state institution "Middle School of General educationNº27",chemistry teacher	
Member of the AC	Kaliev Amangeldy	Municipal state institution "Middle School of General educationNº4",chemistry teacher	
Member of the AC	Sovetbekova Alfia	MChE-201,1 course	
Member of the AC	Toleubaev Beknur	MChE-201,1 course	

Reviewing

Full name of the reviewer	Position, place of work	Signature
Akimbayeva Dariga	Municipal state institution "Middle School of General education Nº4",schoolmaster	

Reviewed

At the meeting of the Quality Assurance Commission
Natural and Mathematical of the faculty
Recommended to be for approved
by the Academic Council of the University
Record No 4.1 "04" April 2023 y.
Chairman of the Commission _____ Zheldybayeva B

Approved at the meeting of the Academic Council of the University Protocol No. 8 "25" April 2023.

Approved

at the meeting of the Academic Council of the University
Protocol № 1 "01" of September 2023
Chairman of the Academic Council of the University Orynbekov D.R.

Content

1.Introduction

1.1.General data

The Department of Natural Science Disciplines of the Faculty of Natural Mathematics trains masters in the educational program 7M01504- Chemistry.

Training of masters in the educational program 7M01504- Chemistry is conducted on a full-time basis on the basis of the educational program of higher education in the scientific and pedagogical direction with a training period of at least two years.

Upon completion of training for graduates of the educational program 7M01504- Chemistry is awarded the academic degree of Master of Pedagogical Sciences.

1.2.Completion criteria

The main criterion for the completion of the educational process for the preparation of masters of the scientific and pedagogical direction is the development of at least 88 credits of theoretical training, including 6 credits of pedagogical practice, 13 credits of research practice, as well as at least 24 credits of research work of a master`s student, including internships and the completion of a master`s thesis, at least 8 credits of the final attestations. A total of 120 credits.

1.3.Typical study duration: 2 years

2.PASSPORT OF THE EDUCATIONAL PROGRAM

2.1.EP purpose	Training of highly qualified specialists in accordance with the competencies of this EP, focused on research activities in the field of education
2.2.Map of the training profile within the educational program	
Code and classification of the field of education	7M01 - Pedagogical sciences
Code and classification of the direction of training	7M015 - Teacher training in natural science subjects
Code in the International Standard Classification of Education	0114
Code and classification of the educational program group	M013 - Preparation of teachers of chemistry (kazakh, russian, english language)
Code and name of the educational program	7M01504 - Chemistry
2.3.Qualification characteristics of the graduate	
Degree awarded / qualification	Master of education under the educational program 7M01504- Chemistry
Name of the profession / list of positions of a specialist	- teacher of chemistry at universities and colleges; лаб laboratory assistant in educational organizations and research institutions ; - the educational master; должностные officials in educational organizations (Director of a general educational institution, deputy directors for educational work, etc.); - methodologist in educational organizations; - specialist in the field of pedagogical sciences; специалист specialist in research institutions
OQF qualification level (industry qualification framework)	7
Area of professional activity	- research institutions; - middle schools, and secondary professional education institutions; - state educational authorities; organizations of various forms of ownership that use methods of teaching chemistry in their work.
Object of professional activity	- apply modern pedagogical technologies in teaching chemistry; - plan and implement research work in the field of pedagogical sciences; - conducting scientific and pedagogical activities in general education organizations; - organizational and management; - social and pedagogical; - educational
Types of professional activity	- apply modern pedagogical technologies in teaching chemistry; - plan and implement research work in the field of pedagogical sciences; - conducting scientific and pedagogical activities in general education organizations; - organizational and management; - social and pedagogical; - educational
Graduate Model	As a result of mastering the master`s program, the graduate must develop general cultural, personal,

	interdisciplinary and professional competencies. A graduate who has mastered the master`s program should have the following general cultural competencies: - the ability to abstract thinking, analysis, synthesis; - readiness for an objective assessment of the personal level of claims, to bear social and ethical responsibility for the decisions made; - readiness for communication in oral and written forms in Russian and foreign languages to solve the problems of professional activity; - readiness for self-development, self-realization, use of creative potential. A graduate who has mastered the master`s program must have personal competencies: - the ability to independently control the course of their intellectual development and achieve the heights of professional skill and creativity; - willingness to enter into communication on cognitive, business, personal motives; - Ability to demonstrate leadership skills. A graduate who has mastered the master`s program must have interdisciplinary competencies: - the ability to solve chemical problems of a theoretical and applied nature, to carry out statistical processing of the results of research activities; - readiness to plan the educational process, in accordance with the content of the chemistry course, to select material, methods, techniques, means for meaningful activities and organization of the developing environment and use it as a means of educating the personality of students at different levels of education; - the ability to integrate knowledge, understanding and the ability to solve problems in new or unfamiliar situations in contexts and within broader (or interdisciplinary) areas related to the field of study. A graduate who has mastered the master`s program must have professional competencies corresponding to the type (types) of professional activity, to which (which) the master`s program is oriented: - the ability to generalize and critically evaluate the results obtained by domestic and foreign researchers, identify promising areas, draw up a research program; - the ability to justify the relevance, theoretical and practical significance of the chosen topic of scientific research; - the ability to conduct independent research in accordance with the developed program; - the ability to present the results of the study to the scientific community in the form of an article or report.

3.Modules and content of the educational program

Sociolinguistic and scientific-pedagogical activity

Foreign language (professional)

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	27399 (3011684)
Course	1
Term	1
Credits count	3
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline

Mastery of general cultural, professional and special competencies for the implementation of professional activities, involving teaching free reading of original literature of the relevant branch of knowledge in a foreign language; development of oral communication skills in monological and dialogical form in the specialty; development of written scientific communication skills on topics related to the scientific work of a graduate student, as well as familiarization with the forms and types of international cooperation in the scientific field.

Purpose of studying of the discipline

The purpose of studying the discipline "Foreign language (professional)" in the master`s degree program is the systematic deepening of communicative competence within the framework of international standards of foreign language education on the basis of further development of skills and abilities of active language proficiency in the professional activity of the future master.

Learning Outcomes

ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.

Prerequisites

Bachelor

Postrequisites

Research practice

History and philosophy of science

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	27398 (3011683)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline is aimed at studying the culture of scientific thinking, forms analytical capabilities and research skills, provides theoretical and practical knowledge necessary for a future scientist. Explores the historical evolution of the sciences and the philosophical perspectives they form. The origins of modern science, its social and institutional connections are described. General philosophical issues related to thought experiments, confirmation and refutation of theories, the origin and application of quantitative and high-quality research methods are considered.

Purpose of studying of the discipline

the formation of an interdisciplinary worldview among undergraduates, based on a deep understanding of the history and philosophy (theory) of scientific thinking, as part of a universal culture.

Learning Outcomes

ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.

Prerequisites

Bachelor

Postrequisites

Research practice

Tertiary education

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	27400 (3011685)

Course	1
Term	1
Credits count	3
Lections	15hours
Practical and seminar classes	15hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline

The course is aimed at studying the main directions, principles and patterns of higher education. During the course of the course, the basic concepts of modern pedagogy, concepts and theories of teaching and upbringing, didactics of higher education will be considered. The master`s student will master the skills of designing the organization of the educational process, techniques of individual and group reflection, will be able to correctly formulate pedagogical goals, apply educational technologies in the educational process. in the process, to design work programs of disciplines.

Purpose of studying of the discipline

The purpose of mastering the discipline is to master the system of knowledge about higher education, its content, structure, principles of educational process management and mastering modern technologies in the field of management and organization of the educational process

Learning Outcomes

ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.

Prerequisites

Bachelor

Postrequisites

Research practice

Psychology of management

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	27403 (3011686)
Course	1
Term	1
Credits count	3
Lections	15hours
Practical and seminar classes	15hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline

The content of the course is aimed at mastering the approaches and directions of management psychology, psychological laws of management, features of planning and solving management problems. Students will get acquainted with the psychological methods of resolving conflict situations, master the ways of motivating work, the methods of using effective management styles. Skills will be formed to analyze the psychological causes underlying the decline in the effectiveness of the management process.

Purpose of studying of the discipline

The purpose of the discipline "Psychology of Management" is the formation of scientifically based ideas about the system of mental phenomena, psychological variables of behavior and conscious human activity in modern conditions and allows undergraduates to form skills of applying the acquired psychological knowledge in educational activities

Learning Outcomes

ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.

Prerequisites

School course

Postrequisites

Research practice

Pedagogical practice

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	27439 (3011648)
Course	2
Term	1
Credits count	6
Pedagogical practics	180hours
Total	180hours
Knowledge control form	Total mark on practice

Short description of discipline
The pedagogical practice of a master student is an important practical component of the second stage of higher education. Consolidation, deepening and development of theoretical knowledge gained at the university, development of professional skills and specific (pedagogical) thinking, formation professional and personal qualities.

Purpose of studying of the discipline
To study the basics of educational and methodological work in higher educational institutions, mastering the pedagogical skills of conducting certain types of training sessions in the disciplines of the profile of master`s programs.

Learning Outcomes
ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
he research work of a student, including an internship and the implementation of a master s thesis II

Applied Chemistry

Management of research activities in organizations of secondary education

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27395 (3011680)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The subject involves the study of methods and functions of research management in secondary education. The significance of the school as a pedagogical system and an object of management, the conceptual apparatus of management and pedagogical management is explained. Mastering this discipline forms the skills of undergraduates to work with regulatory documents in the field of education management.

Purpose of studying of the discipline
Consideration of issues related to the creation of an effective system of education management, ensuring the formation of a person who consciously understands the social and personal significance of professional activity, responsible for its results.

Learning Outcomes
ON2 Apply modern pedagogical technologies in everyday professional activities in the process of learning chemistry.
ON3 To solve the problems of higher pedagogical education and the prospects for its further development;to consider the use of effective University technology;to solve current and psychological and pedagogical problems,to evaluate the results achieved.

Prerequisites
Bachelor

Postrequisites
Research practice

Methodology and modern technologies of teaching General and inorganic chemistry

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27325 (3011649)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline provides for the study of the methodological foundations of teaching general and inorganic chemistry, the methodology for the formation of goals of teaching inorganic chemistry, modern methods for teaching chemistry. When studying the course, students develop systemic knowledge about the structural-logical connection and sequence of the content of educational material, about the classification of chemical sciences.

Purpose of studying of the discipline

To acquire knowledge in the field of methodology of general and inorganic chemistry at the level of the current state of science.

Learning Outcomes

ON2 Apply modern pedagogical technologies in everyday professional activities in the process of learning chemistry.
ON3 To solve the problems of higher pedagogical education and the prospects for its further development;to consider the use of effective University technology;to solve current and psychological and pedagogical problems,to evaluate the results achieved.

Prerequisites

Bachelor

Postrequisites

Research practice

Structural and substantive aspects of textbooks by chemical disciplines

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27396 (3011682)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This course examines and reveals the importance of the textbook in teaching chemistry as a teaching system, the main components of textbooks, the organization of students` learning activities, the requirements for the content and structure of the text of the textbook, the content of existing and alternative textbooks in chemistry at school.

Purpose of studying of the discipline

To acquaint undergraduates with the requirements and content of the structure of classical, electronic, multimedia and other modern textbooks in chemistry at school and higher education.

Learning Outcomes

ON2 Apply modern pedagogical technologies in everyday professional activities in the process of learning chemistry.
ON3 To solve the problems of higher pedagogical education and the prospects for its further development;to consider the use of effective University technology;to solve current and psychological and pedagogical problems,to evaluate the results achieved.

Prerequisites

Bachelor

Postrequisites

Research practice

Methods of solving chemical problems in higher education

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27433 (3011664)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

In this course, practical skills and abilities are formed to use natural science and mathematical knowledge for orientation in the modern information space, master the skills of a thought experiment when solving computational and experimental problems. The study of this discipline allows you to monitor learning outcomes using criteria-based assessment. The study of the course is necessary for the implementation of practical work as a teacher of higher education, as well as for the implementation of master`s methodological studies.

Purpose of studying of the discipline

To study modern methods of solving chemical problems in higher education.

Learning Outcomes

ON2 Apply modern pedagogical technologies in everyday professional activities in the process of learning chemistry.
ON3 To solve the problems of higher pedagogical education and the prospects for its further development;to consider the use of effective University technology;to solve current and psychological and pedagogical problems,to evaluate the results achieved.

Prerequisites

Tertiary education

Postrequisites
Pedagogical practice

Methodology for constructing tasks on functional literacy of students in chemistry lessons

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27437 (3011674)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This course is an introduction to the practice of using PISA tasks for the development of functional literacy in chemistry lessons, solving various types of exercises: situational, practice-oriented tasks, open tasks with a number of visible features that are reflected in their conditions. In the course of teaching this discipline, undergraduates form a methodological understanding of the methods for constructing tasks of functional literacy of students in chemistry and aspects of their solution.
Purpose of studying of the discipline
Formation of undergraduates` understanding of the main important aspects of the methodology for constructing functional literacy tasks in chemistry lessons.
Learning Outcomes
ON2 Apply modern pedagogical technologies in everyday professional activities in the process of learning chemistry.
ON3 To solve the problems of higher pedagogical education and the prospects for its further development;to consider the use of effective University technology;to solve current and psychological and pedagogical problems,to evaluate the results achieved.
Prerequisites
Tertiary education
Postrequisites
Pedagogical practice

Methods for solving chemical problems of increased complexity

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27438 (3011675)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is devoted to the study of methods for solving chemical problems of increased complexity. The solution of level tasks, tasks with industrial environmental content, taking into account the regional component, is considered. Students develop the skills and abilities to calculate problems of increased complexity, using a logical focus, the ability to apply mathematical calculations of high complexity to assess chemical problems in the course of scientific research.
Purpose of studying of the discipline
To acquaint undergraduates with various types of chemical problems, teach them to solve problems from simple to problems of an increased level of complexity offered at international olympiads, show algorithms for solving chemical problems.
Learning Outcomes
ON2 Apply modern pedagogical technologies in everyday professional activities in the process of learning chemistry.
ON3 To solve the problems of higher pedagogical education and the prospects for its further development;to consider the use of effective University technology;to solve current and psychological and pedagogical problems,to evaluate the results achieved.
Prerequisites
Tertiary education
Postrequisites
Pedagogical practice

Environmental and chemical aspects of the study of the atmosphere

Discipline cycle	Profiling discipline
Discipline component	Electives

SubjectID	33138 (3011657)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is devoted to the study of the chemical and ecological properties of the atmosphere. Such as the composition and structure of the atmosphere, natural and anthropogenic factors affecting the state of the atmosphere, methods of air purification. This discipline contributes to the development of students` skills in determining the chemical composition of the atmosphere, predicting the behavior of pollutants in air objects, as well as the ability to analyze the data obtained as a result of research on the chemical composition of air.

Purpose of studying of the discipline
To study the chemical and ecological properties of the atmosphere.

Learning Outcomes
ON2 Apply modern pedagogical technologies in everyday professional activities in the process of learning chemistry.
ON3 To solve the problems of higher pedagogical education and the prospects for its further development;to consider the use of effective University technology;to solve current and psychological and pedagogical problems,to evaluate the results achieved.

Prerequisites
Bachelor

Postrequisites
Pedagogical practice

Environmental and chemical aspects of the study of the lithosphere

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27429 (3011656)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is devoted to the study of the chemical and ecological properties of the lithosphere. Such as the composition and structure of the lithosphere, natural and anthropogenic factors affecting the state of the lithosphere, soil cleaning methods. This discipline contributes to the development of students` skills in determining the chemical composition of the lithosphere, predicting the behavior of pollutants in soil objects, as well as the ability to analyze the data obtained as a result of research on the chemical composition of soils.

Purpose of studying of the discipline
To study the chemical and ecological properties of the lithosphere.

Learning Outcomes
ON2 Apply modern pedagogical technologies in everyday professional activities in the process of learning chemistry.
ON3 To solve the problems of higher pedagogical education and the prospects for its further development;to consider the use of effective University technology;to solve current and psychological and pedagogical problems,to evaluate the results achieved.

Prerequisites
Bachelor

Postrequisites
Pedagogical practice

Chemico-ecological aspects of hydrosphere studies

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27430 (3011658)
Course	1
Term	2
Credits count	5
Lections	15hours

Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline studies the chemical and ecological properties of the hydrosphere. Such as the composition and structure of the hydrosphere, natural and anthropogenic factors affecting the state of the hydrosphere, methods of purification of water masses. This discipline contributes to the development of students` skills in determining the chemical composition of natural and industrial waters, predicting the behavior of pollutants in water bodies, as well as the ability to analyze the data obtained as a result of research on the chemical composition of waters.

Purpose of studying of the discipline

To study the chemical and ecological properties of the lithosphere.

Learning Outcomes

ON2 Apply modern pedagogical technologies in everyday professional activities in the process of learning chemistry.
ON3 To solve the problems of higher pedagogical education and the prospects for its further development;to consider the use of effective University technology;to solve current and psychological and pedagogical problems,to evaluate the results achieved.

Prerequisites

Bachelor

Postrequisites

Pedagogical practice

Actual problems of modern chemistry

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27442 (3011652)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline studies topical problems of modern chemistry. One of the key problems of modern chemistry is chemical synthesis, atomic and molecular structure and electronic structure of newly synthesized compounds, as well as the development of new chemical materials, optimization of chemical processes, development of chemical energy. The study of this discipline contributes to the development of research skills in students, the ability to predict chemical phenomena in various fields of science.

Purpose of studying of the discipline

To study actual problems of modern chemistry

Learning Outcomes

ON2 Apply modern pedagogical technologies in everyday professional activities in the process of learning chemistry.
ON3 To solve the problems of higher pedagogical education and the prospects for its further development;to consider the use of effective University technology;to solve current and psychological and pedagogical problems,to evaluate the results achieved.

Prerequisites

Tertiary education

Postrequisites

Research practice

Selected chapters of General chemistry

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27452 (3011677)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This discipline provides for the study of the sections of the course "General Chemistry", related to the structure of substances, mechanisms of chemical processes. The development of this discipline is a basis of creative thinking, the formation of a scientific worldview for undergraduates, contributes to the connection between chemistry and life, equips the future teacher with a set of knowledge.

Purpose of studying of the discipline

A more detailed study of certain issues of the basic discipline necessary for the formation of a scientific and methodological approach in the creative activity of a future research scientist.

Learning Outcomes

ON2 Apply modern pedagogical technologies in everyday professional activities in the process of learning chemistry.
ON3 To solve the problems of higher pedagogical education and the prospects for its further development;to consider the use of effective University technology;to solve current and psychological and pedagogical problems,to evaluate the results achieved.

Prerequisites

Tertiary education

Postrequisites

Research practice

Modern biochemistry radiation problems

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27443 (3011661)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This discipline studies the effect of ionizing and non-ionizing radiation on biological objects. Consider questions about the radiation background, its components, about the main methods of registration of ionizing radiation. Issues of radiation biochemistry of bioorganic molecules, problems of radiation ecology and hygiene are discussed. They will solve situational problems on the topic of the lesson.

Purpose of studying of the discipline

Formation of undergraduates` system of ideas about the role of radiation-biochemical research in solving the main problems of modern radiobiology.

Learning Outcomes

ON2 Apply modern pedagogical technologies in everyday professional activities in the process of learning chemistry.
ON3 To solve the problems of higher pedagogical education and the prospects for its further development;to consider the use of effective University technology;to solve current and psychological and pedagogical problems,to evaluate the results achieved.

Prerequisites

History and philosophy of science

Postrequisites

Research practice

Methodological aspects of the study of chemical disciplines

Modern interactive methods of teaching in a secondary school

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27332 (3011654)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This discipline provides for the study of the legislative and regulatory framework for the organization of education at the university, new educational technologies used in the training of a specialist; systems of chemical knowledge in non- chemical specialties. The development of discipline is a basis for the formation of special professional competence of future teachers in the field of teaching methods.

Purpose of studying of the discipline

To study modern interactive teaching methods used in the training of a specialist.

Learning Outcomes
ON4 To form practical skills of teaching methods and training in universities.
ON5 To develop educational resources using modern means of information and information technologies in the educational process.
ON6 To link educational material on all issues of the university program of chemical disciplines for daily professional activities.

Prerequisites
Bachelor

Postrequisites
Research practice

The modular technology of training of chemical disciplines in the university

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27343 (3011655)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This course considers the study of general concepts of the technology of modular learning, the concepts of advanced study of theoretical material in modular blocks. When studying the course, students develop systemic knowledge about the principles of modular learning, the essence of block-modular learning, the advantages and significance of modular learning technology.

Purpose of studying of the discipline
To study the basic characteristics of the technology of modular learning, the concept of ahead of the study of theoretical material with enlarged blocks, algorithmization of educational activity, the completeness and consistency of the cycles of cognition and other activities.

Learning Outcomes
ON4 To form practical skills of teaching methods and training in universities.
ON5 To develop educational resources using modern means of information and information technologies in the educational process.
ON6 To link educational material on all issues of the university program of chemical disciplines for daily professional activities.

Prerequisites
Bachelor

Postrequisites
Research practice

Modern technologies of teaching chemistry in universities

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27329 (3011653)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline provides for the study of modern technologies for teaching chemistry in universities, allowing the future teacher to design classes and lessons in order to achieve the educational goals provided for by the program for studying chemistry. When studying the course, students develop systemic knowledge about the techniques of chemistry teaching technologies.

Purpose of studying of the discipline
To study modern interactive teaching methods used in the training of a specialist.

Learning Outcomes
ON4 To form practical skills of teaching methods and training in universities.
ON5 To develop educational resources using modern means of information and information technologies in the educational process.
ON6 To link educational material on all issues of the university program of chemical disciplines for daily professional activities.

Prerequisites

Bachelor

Postrequisites

Research practice

Theoretical and applied aspects of modern organic chemistry and biochemistry

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27431 (3011660)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This course expands the understanding of the main sections of dynamic, static, functional biochemistry, the functioning and regulation of the main biochemical processes in eukaryotes and prokaryotes. Based on the knowledge of organic and biochemistry using modern equipment and instruments, undergraduates acquire experimental skills in biological chemistry to solve specific experimental problems. The knowledge and skills acquired by students are necessary in the further process of teaching professional disciplines

Purpose of studying of the discipline

To study the methodological foundations of teaching biochemistry, methodological aspects of teaching the main sections of dynamic, static, functional biochemistry.

Learning Outcomes

ON4 To form practical skills of teaching methods and training in universities.
ON5 To develop educational resources using modern means of information and information technologies in the educational process.
ON6 To link educational material on all issues of the university program of chemical disciplines for daily professional activities.

Prerequisites

Tertiary education

Postrequisites

Pedagogical practice

Methodological aspects of teaching the organic chemistry and the high molecular compounds chemistry

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27432 (3011659)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This course expands and deepens the knowledge of undergraduates in electronic imaging in the theory of the chemical structure of organic compounds, the basics of conformational isomerism and stereochemistry. Considers the theory of reactions of organic compounds and the chemistry of macromolecular compounds. Forms the necessary set of knowledge, skills and abilities for undergraduates for independent planning and implementation of various types of training. Allows you to independently solve pedagogical and methodological problems.

Purpose of studying of the discipline

To acquaint undergraduates with specific exposition and assimilation of material on organic chemistry and chemistry of high-molecular compounds in high school

Learning Outcomes

ON4 To form practical skills of teaching methods and training in universities.
ON5 To develop educational resources using modern means of information and information technologies in the educational process.
ON6 To link educational material on all issues of the university program of chemical disciplines for daily professional activities.

Prerequisites

Tertiary education

Postrequisites

Pedagogical practice

The research work of a student, including an internship and the implementation of a master s thesis I

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	27436 (3011687)
Course	1
Term	2
Credits count	11
The research work	330hours
Total	330hours
Knowledge control form	Total mark on practice

Short description of discipline
Research practice is aimed at developing creative thinking and independence in undergraduate students, deepening and consolidating the received theoretical and practical knowledge, identifying the most gifted and talented undergraduates, using their creative and intellectual potential to solve urgent problems of science and technology.

Purpose of studying of the discipline
Formation of students` research competencies necessary for conducting scientific research and solving professional problems.

Learning Outcomes
ON8 To solve problems arising in the course of research activities and requiring in-depth professional knowledge; choose the necessary research methods, modify existing and develop new methods based on the objectives of a particular study; methodology of natural science, socio-humanitarian and technical knowledge.

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
he research work of a student, including an internship and the implementation of a master s thesis II

Scientifically-methodical bases of pre and profile training of students in chemistry

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27434 (3011678)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline studies the essence and purpose of pre-profile and profile training; general provisions and organization of pre-profile and profile training. In the course of studying the discipline, the state of pre-profile and profile training in the Republic of Kazakhstan, the concept of teaching the organization of the educational process is considered. The study of the discipline allows you to master methodological approaches to the choice of teaching methods and the use of the main organizational forms of teaching chemistry within the framework of pre-profile and specialized elective courses.

Purpose of studying of the discipline
To study the essence and purpose of pre-profile and profile training of students.

Learning Outcomes
ON4 To form practical skills of teaching methods and training in universities.
ON5 To develop educational resources using modern means of information and information technologies in the educational process.
ON6 To link educational material on all issues of the university program of chemical disciplines for daily professional activities.

Prerequisites
Tertiary education

Postrequisites
Pedagogical practice

Methodological aspects of teaching of Physical Chemistry and Electrochemistry

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27447 (3011666)
Course	2
Term	1
Credits count	5
Lections	15hours

Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline is devoted to the methodological aspects of teaching physical chemistry and electrochemistry. The issues of teaching methods of such sections as chemical thermodynamics, electrochemistry, catalysis, kinetics are considered. Students develop the skills of a methodical approach when studying topics of a physical and chemical orientation, the ability to apply scientific data in pedagogical practice, and also to mathematically express the results obtained in the course of scientific research.

Purpose of studying of the discipline
To study the methodological aspects of teaching physical chemistry and electrochemistry.

Learning Outcomes
ON4 To form practical skills of teaching methods and training in universities.
ON5 To develop educational resources using modern means of information and information technologies in the educational process.
ON6 To link educational material on all issues of the university program of chemical disciplines for daily professional activities.

Prerequisites
Tertiary education

Postrequisites
Research practice

Design of research activity of chemistry teacher

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27449 (3011670)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This course reveals all aspects of the project activity method, the current classification, its types.Considers the main aspects of the theory and practice of design: the conceptual foundations of the project method, project typology, design methods, project structure, requirements for project documentation, rules for registration and protection, etc. During the training, it prepares future teachers for methodological support of project methodology and students for accompanying themin independent educational and cognitive activity.

Purpose of studying of the discipline
To study the research activities of a teacher of an educational institution

Learning Outcomes
ON4 To form practical skills of teaching methods and training in universities.
ON5 To develop educational resources using modern means of information and information technologies in the educational process.
ON6 To link educational material on all issues of the university program of chemical disciplines for daily professional activities.

Prerequisites
Tertiary education

Postrequisites
Research practice

Innovation technologies in teaching chemistry

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27451 (3011676)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline provides for the study of innovative methods, technologies and teaching methods, trends and directions for the

development of world education. The development of this discipline is a basis for the formation of the ability to analyze and implement innovative technologies in the educational process. When studying the course, students develop systemic knowledge about interactive methods.

Purpose of studying of the discipline

Formation of professional competencies of undergraduates through their mastery of knowledge about innovative models of education, technologies and methods of education, about trends and directions in the development of education in the world.

Learning Outcomes

ON4 To form practical skills of teaching methods and training in universities.
ON5 To develop educational resources using modern means of information and information technologies in the educational process.
ON6 To link educational material on all issues of the university program of chemical disciplines for daily professional activities.

Prerequisites

Tertiary education

Postrequisites

Research practice

Methods of development of electronic textbooks on chemical disciplines

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27441 (3011651)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This discipline studies the use of innovative educational tools. In the course of studying the discipline, undergraduates will master the classification of educational resources, receive general information about electronic textbooks and the structural organization of an electronic textbook; be able to distinguish between the advantages and disadvantages of an electronic textbook. The course also discusses the forms and methods of teaching chemistry using electronic resources and provides an overview of educational resources in chemistry on electronic media.

Purpose of studying of the discipline

To study innovative educational means (personality- oriented technologies; technologies of differentiation and individualization; specialized training; information technologies and others).

Learning Outcomes

ON4 To form practical skills of teaching methods and training in universities.
ON5 To develop educational resources using modern means of information and information technologies in the educational process.
ON6 To link educational material on all issues of the university program of chemical disciplines for daily professional activities.

Prerequisites

Tertiary education

Postrequisites

Research practice

Methodological aspects of the study course “Structure of Matter”

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27445 (3011663)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This discipline provides for the study of modern problems of the structure of matter, the stability of the molecular form of matter; electrical, magnetic and optical properties, condensed phases: crystals, liquids, mesophases, amorphous substances, quasicrystals, nanocrystals. When studying the course, students develop systemic knowledge about experimental and theoretical methods for studying the structure of molecules and substances.

Purpose of studying of the discipline

To study modern problems of the structure of matter.

Learning Outcomes
ON4 To form practical skills of teaching methods and training in universities.
ON5 To develop educational resources using modern means of information and information technologies in the educational process.
ON6 To link educational material on all issues of the university program of chemical disciplines for daily professional activities.
Prerequisites
Tertiary education
Postrequisites
Research practice

Methodological aspects of the study courses "Catalysis" and "Colloid Chemistry

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27444 (3011662)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline is devoted to the study of the methodological aspects of the courses "Catalysis" and "Colloid Chemistry". The types of catalysis, methods of application in industry, the main issues of colloid chemistry, such as the composition, properties and preparation of dispersed systems, purification and diffusion of sols are considered. Students develop skills in working with colloidal systems, the ability to analyze the results obtained, plan an experiment and use mathematical methods for expressing results.
Purpose of studying of the discipline
To study the main sections of the courses "Catalysis" and "Colloid Chemistry".
Learning Outcomes
ON4 To form practical skills of teaching methods and training in universities.
ON5 To develop educational resources using modern means of information and information technologies in the educational process.
ON6 To link educational material on all issues of the university program of chemical disciplines for daily professional activities.
Prerequisites
Tertiary education
Postrequisites
Research practice

Methodical aspects of studying of a course “General chemical technology”

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27448 (3011667)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline provides for the study of the methodological foundations of teaching chemical technology, teaching methods for the basic laws of chemical technology, the most important chemical industries. When studying the course, students develop systematic knowledge in the field of methodology for studying modern problems of chemical technology at the level of the current state of science and industry.
Purpose of studying of the discipline
Get acquainted with chemical production as a complex chemical- technological system, mainly at a general level and, accordingly, consider the general problems of analysis and synthesis of chemical production.
Learning Outcomes
ON4 To form practical skills of teaching methods and training in universities.
ON5 To develop educational resources using modern means of information and information technologies in the educational process.
ON6 To link educational material on all issues of the university program of chemical disciplines for daily professional activities.
Prerequisites
Tertiary education
Postrequisites

Research practice

Methodological aspects of teaching analytical chemistry and chemistry of rare elements

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27446 (3011665)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This discipline is devoted to the study of methodological aspects of teaching analytical chemistry and chemistry of rare elements. Questions of qualitative and quantitative analysis, physicochemical methods of analysis are considered. Students develop methodological skills to determine the qualitative and quantitative composition of a substance, perform calculations to determine chemical pollutants in the environment, draw logical conclusions and develop the skills necessary for a higher education teacher

Purpose of studying of the discipline

To study the methodological aspects of teaching analytical chemistry and chemistry of rare elements.

Learning Outcomes

ON4 To form practical skills of teaching methods and training in universities.
ON5 To develop educational resources using modern means of information and information technologies in the educational process.
ON6 To link educational material on all issues of the university program of chemical disciplines for daily professional activities.

Prerequisites

Tertiary education

Postrequisites

Research practice

Methodological aspects of teaching the history of chemistry

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27440 (3011650)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

In this course, the research skills of undergraduates are formed through the study of the problems of the philosophy of chemistry and the history of science; ideas about the modern methodology of scientific knowledge are studied; about the analysis of the theoretical and empirical possibilities of the main participants in modern science research and about overcoming one- sided approaches, both subjectivist and objectivist. The correlation of the course of the history and methodology of chemistry with the general methodology of natural science and philosophy is determined

Purpose of studying of the discipline

To form the research skills of undergraduates through the study of the problems of the philosophy of chemistry and the history of science.

Learning Outcomes

ON4 To form practical skills of teaching methods and training in universities.
ON5 To develop educational resources using modern means of information and information technologies in the educational process.
ON6 To link educational material on all issues of the university program of chemical disciplines for daily professional activities.

Prerequisites

Tertiary education

Postrequisites

Research practice

Модуль 4. Didactic monitoring

Methods of evaluation and self-esteem of students in the learning process

Discipline cycle	Basic disciplines

Discipline component	Electives
SubjectID	33137 (3011669)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

Diagnostics in the pedagogical process. Control, evaluation of knowledge, skills of trainees as necessary components of diagnosing. The most important principles for diagnosing and monitoring the learning (progress) of students (objectivity, systematic, visibility (publicity)). A variety of qualitative and quantitative criteria in pedagogy. Methodology for the development of students` evaluative independence. The role and place of self-esteem in the personal development of students. Criteria assessment methods aimed at developing self-esteem. Formative and summative assessment.

Purpose of studying of the discipline

To study the most important principles of diagnosing and monitoring the learning (progress) of students (objectivity, systematic, visibility (publicity)).A variety of qualitative and quantitative criteria in pedagogy.

Learning Outcomes

ON7 To design a system of evaluation criteria for various educational technologies used in educational institutions.
ON8 To solve problems arising in the course of research activities and requiring in-depth professional knowledge; choose the necessary research methods, modify existing and develop new methods based on the objectives of a particular study; methodology of natural science, socio-humanitarian and technical knowledge.

Prerequisites

Postrequisites

Criteria-based assessment of students` achievements

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27392 (3011668)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This discipline is devoted to the study of the analysis of educational achievements of students on the basis of short-term goals and learning outcomes in accordance with the curriculum. Considers issues related to the motivation of students to fill gaps in the study of the curriculum. In the course of studying the discipline, undergraduates develop skills in developing criteria for students` educational achievements, assessing the types of educational activities.

Purpose of studying of the discipline

To study, on the basis of existing scientific achievements, the Kazakhstani system of criteria-based assessment of learning outcomes to improve the quality of school education in general and the level of educational achievements of each student.

Learning Outcomes

ON7 To design a system of evaluation criteria for various educational technologies used in educational institutions.
ON8 To solve problems arising in the course of research activities and requiring in-depth professional knowledge; choose the necessary research methods, modify existing and develop new methods based on the objectives of a particular study; methodology of natural science, socio-humanitarian and technical knowledge.

Prerequisites

Bachelor

Postrequisites

Research practice

Organization of pedagogical scientific research

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27394 (3011679)
Course	1
Term	1

Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This course examines the principles of choosing methods of scientific and pedagogical research, the levels and classification of pedagogical research. When studying the course, undergraduates will acquire the skills of organizing pedagogical research, they will know the generally accepted methodological parameters and stages of pedagogical research, the main criteria for the quality of pedagogical research They will master the logic of research search through the implementation of a number of stages: empirical, hypothetical, experimental-theoretical (or theoretical), predictive

Purpose of studying of the discipline
To study the principles of choosing methods of scientific and pedagogical research, the levels and classification of pedagogical research.

Learning Outcomes
ON7 To design a system of evaluation criteria for various educational technologies used in educational institutions.
ON8 To solve problems arising in the course of research activities and requiring in-depth professional knowledge; choose the necessary research methods, modify existing and develop new methods based on the objectives of a particular study; methodology of natural science, socio-humanitarian and technical knowledge.

Prerequisites
Bachelor

Postrequisites
Research practice

Research activities of students in chemistry

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	27435 (3011681)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This course provides for the organization of design and research activities of students in educational institutions. Undergraduates consider the system of research methods in chemistry, methods of working with chemical information and literature, the main stages of scientific research.Undergraduates will also analyze the best practices of teachers on the organization of research activities.

Purpose of studying of the discipline
To study the organization of design and research activities of students in educational institutions.

Learning Outcomes
ON7 To design a system of evaluation criteria for various educational technologies used in educational institutions.
ON8 To solve problems arising in the course of research activities and requiring in-depth professional knowledge; choose the necessary research methods, modify existing and develop new methods based on the objectives of a particular study; methodology of natural science, socio-humanitarian and technical knowledge.

Prerequisites
Tertiary education

Postrequisites
Pedagogical practice

he research work of a student, including an internship and the implementation of a master s thesis II

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	27450 (3011672)
Course	2
Term	1
Credits count	4
The research work	120hours
Total	120hours

Knowledge control form	Total mark on practice

Short description of discipline
Research is aimed at developing undergraduates` creative thinking and independence, deepening and consolidating the received theoretical and practical knowledge, identifying the most gifted and talented undergraduates, using their creative and intellectual potential to solve urgent problems of science and technology.

Purpose of studying of the discipline
The purpose of the research work is the integration of the educational process with the development of the professional field of activity in the areas of master`s training to ensure the formation of students` research competencies necessary for conducting research and solving professional problems.

Learning Outcomes
ON8 To solve problems arising in the course of research activities and requiring in-depth professional knowledge; choose the necessary research methods, modify existing and develop new methods based on the objectives of a particular study; methodology of natural science, socio-humanitarian and technical knowledge.

Prerequisites
The research work of a student, including an internship and the implementation of a master s thesis I

Postrequisites
The research work of a student, including an internship and the implementation of a master s thesis III

Research practice

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	27453 (3011671)
Course	2
Term	2
Credits count	13
Working practice	390hours
Total	390hours
Knowledge control form	Total mark on practice

Short description of discipline
The research practice of a master student is an important practical component of the second stage of higher education. Research practice contributes to the consolidation and deepening of the theoretical knowledge of undergraduates (doctoral students) obtained during training, the ability to set tasks, analyze the results and draw conclusions. Research practice is of great importance for the dissertation. Research practice ensures that the trainee acquires the skills necessary for future professional activities.

Purpose of studying of the discipline
The purpose of the research practice is to gain experience in the study of an actual scientific problem, to expand the professional knowledge gained by undergraduates in the learning process, and to form practical skills for conducting independent scientific work.

Learning Outcomes
ON3 To solve the problems of higher pedagogical education and the prospects for its further development;to consider the use of effective University technology;to solve current and psychological and pedagogical problems,to evaluate the results achieved.
ON8 To solve problems arising in the course of research activities and requiring in-depth professional knowledge; choose the necessary research methods, modify existing and develop new methods based on the objectives of a particular study; methodology of natural science, socio-humanitarian and technical knowledge.

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Final examination

The research work of a student, including an internship and the implementation of a master s thesis III

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	27454 (3011673)
Course	2
Term	2
Credits count	9
The research work	270hours
Total	270hours
Knowledge control form	Total mark on practice

Short description of discipline
Research is aimed at developing undergraduates` creative thinking and independence, deepening and consolidating the received theoretical and practical knowledge, identifying the most gifted and talented undergraduates, using their creative and intellectual potential to solve urgent problems of science and technology.

Purpose of studying of the discipline
The purpose of research is to develop in students the research competencies necessary for conducting scientific research and solving professional problems.

Learning Outcomes
ON3 To solve the problems of higher pedagogical education and the prospects for its further development;to consider the use of

effective University technology;to solve current and psychological and pedagogical problems,to evaluate the results achieved.
ON8 To solve problems arising in the course of research activities and requiring in-depth professional knowledge; choose the necessary research methods, modify existing and develop new methods based on the objectives of a particular study; methodology of natural science, socio-humanitarian and technical knowledge.

Prerequisites

he research work of a student, including an internship and the implementation of a master s thesis II The research work of a student, including an internship and the implementation of a master s thesis I

Postrequisites

Final examination

Final certification

Master`s dissertation

Credits count	8

4.Summary table on the scope of the educational program

«7M01504 - Chemistry»

Name of discipline	Cycle/ Component	Term	Number of credits	Total hours	Lec	SPL	LC	IWST	IWS	Knowledge control form
Sociolinguistic and scientific-pedagogical activity										
Foreign language (professional)	BS/US	1	3	90		30		20	40	Examination
History and philosophy of science	BS/US	1	5	150	15	30		35	70	Examination
Tertiary education	BS/US	1	3	90	15	15		20	40	Examination
Psychology of management	BS/US	1	3	90	15	15		20	40	Examination
Pedagogical practice	BS/US	3	6	180						Total mark on practice
Applied Chemistry										
Management of research activities in organizations of secondary education	BS/CCh	1	5	150	15	30		35	70	Examination
Methodology and modern technologies of teaching General and inorganic chemistry	BS/CCh	1	5	150	15	30		35	70	Examination
Structural and substantive aspects of textbooks by chemical disciplines	BS/CCh	1	5	150	15	30		35	70	Examination
Methods of solving chemical problems in higher education	AS/CCh	2	5	150	15	30		35	70	Examination
Methodology for constructing tasks on functional literacy of students in chemistry lessons	AS/CCh	2	5	150	15	30		35	70	Examination
Methods for solving chemical problems of increased complexity	AS/CCh	2	5	150	15	30		35	70	Examination
Environmental and chemical aspects of the study of the atmosphere	AS/CCh	2	5	150	15	30		35	70	Examination
Environmental and chemical aspects of the study of the lithosphere	AS/CCh	2	5	150	15	30		35	70	Examination
Chemico-ecological aspects of hydrosphere studies	AS/CCh	2	5	150	15	30		35	70	Examination
Actual problems of modern chemistry	AS/CCh	3	5	150	15	30		35	70	Examination
Selected chapters of General chemistry	AS/CCh	3	5	150	15	30		35	70	Examination
Modern biochemistry radiation problems	AS/CCh	3	5	150	15	30		35	70	Examination
Methodological aspects of the study of chemical disciplines										
Modern interactive methods of teaching in a secondary school	BS/CCh	1	5	150	15	30		35	70	Examination
The modular technology of training of chemical disciplines in the university	BS/CCh	1	5	150	15	30		35	70	Examination
Modern technologies of teaching chemistry in universities	BS/CCh	1	5	150	15	30		35	70	Examination
Theoretical and applied aspects of modern organic chemistry and biochemistry	AS/CCh	2	5	150	15	30		35	70	Examination
Methodological aspects of teaching the organic chemistry and the high molecular compounds chemistry	AS/CCh	2	5	150	15	30		35	70	Examination

The research work of a student, including an internship and the implementation of a master s thesis I	AS/US	2	11	330						Total mark on practice
Scientifically-methodical bases of pre and profile training of students in chemistry	AS/CCh	2	5	150	15	30		35	70	Examination
Methodological aspects of teaching of Physical Chemistry and Electrochemistry	AS/CCh	3	5	150	15	30		35	70	Examination
Design of research activity of chemistry teacher	AS/CCh	3	5	150	15	30		35	70	Examination
Innovation technologies in teaching chemistry	AS/CCh	3	5	150	15	30		35	70	Examination
Methods of development of electronic textbooks on chemical disciplines	AS/CCh	3	5	150	15	30		35	70	Examination
Methodological aspects of the study course “Structure of Matter”	AS/CCh	3	5	150	15	30		35	70	Examination
Methodological aspects of the study courses "Catalysis" and "Colloid Chemistry	AS/CCh	3	5	150	15	30		35	70	Examination
Methodical aspects of studying of a course “General chemical technology”	AS/CCh	3	5	150	15	30		35	70	Examination
Methodological aspects of teaching analytical chemistry and chemistry of rare elements	AS/CCh	3	5	150	15	30		35	70	Examination
Methodological aspects of teaching the history of chemistry	AS/CCh	3	5	150	15	30		35	70	Examination
Модуль 4. Didactic monitoring										
Methods of evaluation and self-esteem of students in the learning process	BS/CCh	1	5	150	15	30		35	70	Examination
Criteria-based assessment of students` achievements	BS/CCh	1	5	150	15	30		35	70	Examination
Organization of pedagogical scientific research	BS/CCh	1	5	150	15	30		35	70	Examination
Research activities of students in chemistry	AS/US	2	5	150	15	30		35	70	Examination
he research work of a student, including an internship and the implementation of a master s thesis II	AS/US	3	4	120						Total mark on practice
Research practice	AS/US	4	13	390						Total mark on practice
The research work of a student, including an internship and the implementation of a master s thesis III	AS/US	4	9	270						Total mark on practice
Final certification										
Master`s dissertation		4	8	240						