NJSC SHAKARIM UNIVERSITY OF SEMEY

EDUCATIONAL PROGRAM

6B05 - Natural Sciences, Mathematics and Statistics
(Code and classifcation of the feld of education)

6B053 - Physical and chemical sciences
(Code and classifcation of the direction of training)

0530
(Code in the International Standard Classifcation of Education)

B053 - Chemistry
(Code and classifcation of the educational program group)

6B05301 - Chemistry
(Code and name of the educational program)

Bachelor
(Level of preparation)

Semey

Educational program

6B05 -- Natural Sciences, Mathematics and Statistics
(Code and classification of the field of education)

6B053 - Physical and chemical sciences
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0530
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bachelor
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Semey 2024

PREFACE

Developed

The educational program 6B05301 - Chemistry in the direction of preparation 6B053 - Physical and chemical sciences 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
Head of the Academic Committee	Kasymov Askar Bagdatovich	Dean of the Research School of Physical and Chemical Sciences
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Reviewing

Full name of the reviewer	Position, place of work
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Reviewed

At the meeting of the Commission on Academic Quality of the Faculty of Engineering and Technology
Protocol №3 15.01. 2024

at the meeting of the Academic quality commission of the Research school of physics and chemical sciences
Recommended for approval by the Academic Council of the University
Protocol №1 06.06.2024

Approved

at a meeting of the University Academic Council by protocol No. 6/1 of January 19, 2024.

at a meeting of the University Academic Council by protocol No. 11 of June 28, 2024.

Content

1.Introduction

1.1.General data

The educational program «6B05301 Chemistry» is developed taking into account the needs of the regional labor market, the requirements of the normative documents of the Ministry of Science and Higer education of the Republic of Kazakhstan a and nd is a system of documents for organizing the educational process.

The uniqueness of the educational program lies in the fact that it includes a large portfolio of elective courses, developed with a strong teaching staff, and a good laboratory base for its implementation.

When implementing the educational program, it is planned to use artificial intelligence tools in the educational process, thereby developing digital competencies among students in a rapidly changing technological environment.

The educational program provides for the education of a student with special educational needs in the conditions of a higher educational institution, as well as his socialization and integration into society.

1.2.Completion criteria

The main criterion for the completion of the educational process for the preparation of bachelors is the mastering by students of at least 205 credits of theoretical training, as well as at least 27 credits of practical training, 8 credits of final certification.
A total of 240 credits.

1.3.Typical study duration: 4 years

2.PASSPORT OF THE EDUCATIONAL PROGRAM

2.1.EP purpose	Providing vocational training and personal development of a graduate as a competitive specialist in the field of chemistry, possessing good educational, methodological and research training
2.2.Map of the training profile within the educational program	
Code and classification of the field of education	6B05 - Natural Sciences, Mathematics and Statistics
Code and classification of the direction of training	6B053 - Physical and chemical sciences
Code in the International Standard Classification of Education	0530
Code and classification of the educational program group	B053 - Chemistry
Code and name of the educational program	6B05301 - Chemistry
2.3.Distinctive features of the OP (double degree/joint, OVPO-partner, Double major, innovative)	-
2.4.Qualification characteristics of the graduate	
Degree awarded / qualification	Bachelor of Science in the educational program
Name of professional standard	Production and sales management in the oil and gas refining and petrochemical industries Oil and gas refining and petrochemicals Radiation control
Atlas of new professions	-
Regional standard	-
Name of the profession / list of positions of a specialist	Chemist; chemical engineer; chemical technologist; laboratory chemist (in laboratories of universities, research institutes of chemical, environmental, etc. profiles; chemical industry enterprises);analyst pharmacist; environmental chemist; secondary teacher general education schools, vocational education institutions, etc. in accordance with qualification the requirements of the Qualification Handbook of Positions managers, specialists and other employees approved by order of the Minister of Labor and Social Protection of the Population Of the Republic of Kazakhstan dated May 21, 2012 No. 201
OQF qualification level (industry qualification framework)	6
Area of professional activity	• the sphere of education, science and ecology; • branches of chemical, metallurgical, petrochemical, pharmaceutical industry; • production laboratories of analytical, environmental, customs, sanitary and epidemiological, certification services, research organizations (institutes, laboratories) of the chemical, environmental, metallurgical, pharmaceutical profile.
Object of professional activity	• chemical substances and materials; • chemical, physical, physicochemical and thermal processes; • methods and devices for determining the composition and properties of substances and

	materials; • methods and means for assessing the state of the environment.
Types of professional activity	• experimental research; • research; • production and technological; • organizational and managerial; • educational (pedagogical) • cultural and educational.
2.5.Graduate Model	EP 6B05301- "Chemistry" trains highly qualified specialists for education, research and production, with in-depth fundamental educational, methodological and research training

3.Modules and content of the educational program

Module 1. Fundamentals of social and humanitarian knowledge

Brief description of the module content

This module reveals such aspects as: socio-cultural, economic-legal, environmental knowledge, communication skills, the use of information technology taking into account modern trends in the development of society.

Module disciplines

Foreign language

Kazakh(Russian) language (1)

Bases of economics, law and ecological knowledge

Physical Culture

Foreign language

History of Kazakhstan

Kazakh(Russian) language (2)

The module of socio-political knowledge (sociology, political science, cultural studies, psychology)

Physical Culture

Physical Culture

World of Abai

Information and communication technology

Physical Culture

Philosophy

Module 2. Application of mathematical methods and physical phenomena and laws in practice

Brief description of the module content

Demonstrate mathematical literacy, logical thinking and knowledge of basic concepts of mathematics and physical laws. Application of basic theories of mathematics and physical sciences to the subject area.

Module disciplines

Mathematics

Fundamentals of Chemical Toxicology

Solving problems of chemistry and chemical technology by computer software

Chemical transformations of pollutants

Chemical Physics

Module 3. Usage theoretical foundations of fundamental sections of chemistry in solving professional problems

Brief description of the module content

Understanding the basic concepts and laws of chemistry, the structure of matter and the patterns of chemical processes. Demonstration of skills in chemical experiments, application of methods of chemical synthesis and analysis of substances in practical activities.

Module disciplines

Introduction to the profession

General chemistry

Inorganic chemistry

Educational practice

Analytical chemistry

Organic chemistry

Solving problems in general and inorganic chemistry

Physical chemistry

Colloidal chemistry

Module 4. Mastering the methods of synthesis, modification and technology for the production of

chemicals and materials

Brief description of the module content

Knowledge of methods of synthesis, modification and technology for producing new chemicals and special materials for special purposes. Ability to select methods for chemical analysis of raw materials and products.

Module disciplines

Mechanisms of organic reactions

Chemical functional derivatives of organic molecules

Chemistry of organometallic compounds

Analysis of minerals

low-waste technology

Fundamentals of technological processes in industry

Macromolecular Chemistry

Chemistry of Natural Compounds

Fundamentals of Biochemistry

Module 5. Use of knowledge in applied and instrumental chemistry in professional activities

Brief description of the module content

Possession of theoretical knowledge and practical skills in analysis using classical physical and chemical methods. Ability to interpret and competently evaluate experimental data and practical hardware capabilities of the most important physical and physicochemical methods of analysis

Module disciplines

Chemical terminology in English

Analytical chemistry of trace amounts

Quantitative analysis in Inorganic Chemistry

Production practice I

The chemical quantitative analysis

Heterocyclic compounds

Multi-core fused and unfused connection

Optical analysis methods

Stereochemistry of organic compounds

Titrimetric methods of analysis

Physical methods of research

Photometry in analytical practice

Electrochemical and optical methods of analysis

Electrochemical methods of analysis

Spectroscopic methods of analysis

Chemical metrology

Chromatographic separation methods and analysis

Petrochemistry

Problems of complex use of petrochemical products

Production practice II

Modern technologies of deep processing of oil, gas and coal

Coordination chemistry

Analysis of inorganic substances

Analysis of oil and petroleum products

Analysis of organic substances

The analysis of natural objects

Catalytic processing of heavy oil fraction

Methods of scientific research in the field of chemistry

Utilization of sulfur and sulfur-organic compounds of oil

Chemical Synthesis

Chemicals metal

Undergraduate practice

Production practice III

Module 6. Mastery of knowledge in the field of pedagogy, methods teaching chemistry

Brief description of the module content

Demonstration of basic knowledge in the field of theory and practice of education. Ability to use fundamental chemical knowledge in professional teaching activities.

Module disciplines

Pedagogy

Methods of Teaching Chemistry

Pedagogical practice

Module 7. Usage environmental knowledge in decision professional tasks

Brief description of the module content

Assessing the possible consequences of the effects of technogenic systems and ionizing radiation on ecosystems. Demonstrating practical skills to solve applied and research problems.

Module disciplines

Ecological Chemistry

Radiation Chemistry

Man-made systems and environmental risk

Chemistry of environmental objects and rare metal raw materials

Final examination

Brief description of the module content

Writing and defending a thesis or preparing and passing a comprehensive exam

Module disciplines

Diploma work

Comprehensive exam

4.Summary table on the scope of the educational program

«6B05301 - Chemistry»

Name of discipline	Cycle/ Component	Term	Number of credits	Total hours	Lec	SPL	LC	IWST	IWS	Knowledge control form
Module 1. Fundamentals of social and humanitarian knowledge										
Foreign language	GER/CC	1	5	150		45		35	70	Examination
Kazakh(Russian) language (1)	GER/CC	1	5	150		45		35	70	Examination
Bases of economics, law and ecological knowledge	GER/US	1	5	150	15	30		35	70	Examination
Physical Culture	GER/CC	1	2	60		60				Differentiated attestation
Foreign language	GER/CC	2	5	150		45		35	70	Examination
History of Kazakhstan	GER/CC	2	5	150	30	15		35	70	Qualification examination
Kazakh(Russian) language (2)	GER/CC	2	5	150		45		35	70	Examination
The module of socio-political knowledge (sociology, political science, cultural studies, psychology)	GER/CC	2	8	240	30	45		55	110	Examination
Physical Culture	GER/CC	2	2	60		60				Differentiated attestation
Physical Culture	GER/CC	3	2	60		60				Differentiated attestation
World of Abai	BS/US	3	3	90	15	15		20	40	Examination
Information and communication technology	GER/CC	4	5	150	15	15	15	35	70	Examination
Physical Culture	GER/CC	4	2	60		60				Differentiated attestation
Philosophy	GER/CC	5	5	150	15	30		35	70	Examination
Module 2. Application of mathematical methods and physical phenomena and laws in practice										
Mathematics	BS/US	1	5	150	15	30		35	70	Examination
Fundamentals of Chemical Toxicology	AS/CCh	6	5	150	15	15	15	35	70	Examination
Solving problems of chemistry and chemical technology by computer software	AS/CCh	6	5	150	15	15	15	35	70	Examination
Chemical transformations of pollutants	AS/CCh	6	5	150	15	15	15	35	70	Examination
Chemical Physics	AS/US	7	5	150	15	30		35	70	Examination
Module 3. Usage theoretical foundations of fundamental sections of chemistry in solving professional problems										
Introduction to the profession	BS/US	1	3	90	15	15		20	40	Examination
General chemistry	BS/US	1	3	90	15		15	20	40	Examination
Inorganic chemistry	BS/US	2	5	150	15	15	15	35	70	Examination
Educational practice	BS/US	2	2	30						Total mark on practice

Analytical chemistry	BS/US	3	5	150	15	15	15	35	70	Examination
Organic chemistry	BS/US	3	5	150	15	15	15	35	70	Examination
Solving problems in general and inorganic chemistry	BS/US	3	5	150		45		35	70	Examination
Physical chemistry	BS/US	3	5	150	15	15	15	35	70	Examination
Colloidal chemistry	BS/CC	5	5	150	15	15	15	35	70	Examination
Module 4. Mastering the methods of synthesis, modification and technology for the production of chemicals and materials										
Mechanisms of organic reactions	BS/US	4	5	150	15	30		35	70	Examination
Chemical functional derivatives of organic molecules	BS/US	4	5	150	15	15	15	35	70	Examination
Chemistry of organometallic compounds	BS/CCh	6	5	150	30		15	35	70	Examination
Analysis of minerals	BS/CCh	6	5	150	15	15	15	35	70	Examination
low-waste technology	BS/CCh	6	5	150	15	15	15	35	70	Examination
Fundamentals of technological processes in industry	BS/CCh	6	5	150	15	15	15	35	70	Examination
Macromolecular Chemistry	BS/CCh	6	5	150	30		15	35	70	Examination
Chemistry of Natural Compounds	BS/CCh	6	5	150	30		15	35	70	Examination
Fundamentals of Biochemistry	AS/CC	6	5	150	15	15	15	35	70	Examination
Module 5. Use of knowledge in applied and instrumental chemistry in professional activities										
Chemical terminology in English	BS/US	3	3	90		30		20	40	Examination
Analytical chemistry of trace amounts	BS/CCh	4	5	150	15	15	15	35	70	Examination
Quantitative analysis in Inorganic Chemistry	BS/CCh	4	5	150	15	15	15	35	70	Examination
Production practice I	BS/US	4	5	150						Total mark on practice
The chemical quantitative analysis	BS/CCh	4	5	150	15	15	15	35	70	Examination
Heterocyclic compounds	BS/CCh	5	5	150	15	15	15	35	70	Examination
Multi-core fused and unfused connection	BS/CCh	5	5	150	15	15	15	35	70	Examination
Optical analysis methods	BS/CCh	5	5	150	15	15	15	35	70	Examination
Stereochemistry of organic compounds	BS/CCh	5	5	150	15	15	15	35	70	Examination
Titrimetric methods of analysis	BS/CCh	5	5	150	30	15	0	35	70	Examination
Physical methods of research	BS/CCh	5	5	150	30	15		35	70	Examination
Photometry in analytical practice	BS/CCh	5	5	150	30	15		35	70	Examination
Electrochemical and optical methods of analysis	BS/CCh	5	5	150	15	15	15	35	70	Examination
Electrochemical methods of analysis	BS/CCh	5	5	150	15	15	15	35	70	Examination
Spectroscopic methods of analysis	AS/CCh	5	5	150	15	15	15	35	70	Examination
Chemical metrology	AS/CCh	5	5	150	15	15	15	35	70	Examination
Chromatographic separation methods and analysis	AS/CCh	5	5	150	15	15	15	35	70	Examination
Petrochemistry	BS/CCh	6	5	150	15	15	15	35	70	Examination

Problems of complex use of petrochemical products	BS/CCh	6	5	150	15	15	15	35	70	Examination
Production practice II	BS/US	6	5	150						Total mark on practice
Modern technologies of deep processing of oil, gas and coal	BS/CCh	6	5	150	15	15	15	35	70	Examination
Coordination chemistry	AS/CCh	7	5	150	15	15	15	35	70	Examination
Analysis of inorganic substances	AS/CCh	7	5	150	15		30	35	70	Examination and term work/Project
Analysis of oil and petroleum products	AS/CCh	7	5	150	15	30		35	70	Examination
Analysis of organic substances	AS/CCh	7	5	150	15		30	35	70	Examination and term work/Project
The analysis of natural objects	AS/CCh	7	5	150	15		30	35	70	Examination and term work/Project
Catalytic processing of heavy oil fraction	AS/CCh	7	5	150	15	30		35	70	Examination
Methods of scientific research in the field of chemistry	AS/US	7	3	90	15	15		20	40	Examination
Utilization of sulfur and sulfur-organic compounds of oil	AS/CCh	7	5	150	15	30		35	70	Examination
Chemical Synthesis	AS/CCh	7	5	150	15	15	15	35	70	Examination
Chemicals metal	AS/CCh	7	5	150	15	15	15	35	70	Examination
Undergraduate practice	AS/CCh	8	8	240						Total mark on practice
Production practice III	AS/CCh	8	8	240						Total mark on practice
Module 6. Mastery of knowledge in the field of pedagogy, methods teaching chemistry										
Pedagogy	BS/US	7	3	90	15	15		20	40	Examination
Methods of Teaching Chemistry	AS/US	7	6	180	15	45		40	80	Examination
Pedagogical practice	AS/US	8	7	210						Total mark on practice
Module 7. Usage environmental knowledge in decision professional tasks										
Ecological Chemistry	AS/US	4	5	150	15	15	15	35	70	Examination
Radiation Chemistry	BS/CCh	7	5	150	15	30		35	70	Examination
Man-made systems and environmental risk	BS/CCh	7	5	150	15	30		35	70	Examination
Chemistry of environmental objects and rare metal raw materials	BS/CCh	7	5	150	15	30		35	70	Examination
Final examination										
Diploma work		8	8	240						
Comprehensive exam		8	8	240						

NON -PROFIT LIMITED COMPANY «SHAKARIM UNIVERSITY OF SEMEY

EDUCATIONAL PROGRAM DEVELOPMENT PLAN
6B05301 «Chemistry»

for 2024 - 2028

Semey 2024

Content

1. Passport of the Development Plan of the Bachelor's degree 6B05301 «Chemistry»

1	The basis for the development	Development program of the Non -Profit Limited Company «Shakarim University of Semey» for 2023-2029 Work plan of the Research School of Physical and Chemical Sciences Strategic development plan of the Department «Chemical and Ecology»
2	Terms of implementation	2024-2028 years
3	Expected results of implementation	Preparation of a competent, competitive, innovation-oriented specialist who adapts to changing conditions of the labor market for the economic sector of our country

2. Analytical justification of the EP

2.1 Information about the educational program

The educational program is developed in accordance with the National Qualifications Framework and Occupational Standards, in accordance with the Dublin Descriptors and the European Qualifications Framework. The typical period for completing a bachelor's degree program is 4 years.

The main criterion for completing the educational process is the completion of at least 240 credits, with the award of a bachelor's degree

The goal of the EP is to ensure the professional training and personal development of the graduate as a competitive specialist in the field of chemistry with modern educational, methodological and research training.

The uniqueness of the educatinal program is that it includes a large portfolio of elective courses, developed taking into account a strong teaching staff and a good laboratory base for its implementation.

Training of specialists in EP 6B05301 – Chemistry is carried out by the special department “Chemistry and Ecology” of the Research School

2.2 Information about students

Academic year / The basis of training	**2024-2025 academic year**	**2025-2026 academic year**	**2026-2027 academic year**	**2027-2028 academic year**
Grant	20	20	25	30
Contract	-	2	3	3
Total	20	22	28	33

2.3 Internal and external conditions for the development of EP

The EP of the specialty includes components for preparing for professional activity. This is reflected in the topics and list of tasks for laboratory and practical classes, in the list of types and forms of completing tasks for the student’s independent work. Various forms of conducting classes (traditional and frontal and demonstration experiments, case methods and project-based

teaching methods, problem-based and step-by-step, modular teaching methods), completing coursework and dissertations, and undergoing professional practices also form professional qualities. Activation of cognitive and scientific-creative activities is also facilitated by the participation of students in scientific circles at the department, in seminars, round tables and conferences. Course curricula, content of lectures, practical and laboratory classes are adjusted taking into account the renewal of the library collection, the requirements of internal and external regulatory documents and concepts of educational development.

EP training sessions are conducted in specialized classrooms and according to dual education at the “Center for Nuclear Medicine” in Semey. Lectures and practical classes are conducted by leading specialists of this institution.

In the conditions of innovative development of the country, the need for the development and implementation of multilingual education in educational activities is of particular relevance. For example, in the discipline “Chemical Terminology in English,” training is conducted in English.

Practical training of EP students is carried out through educational, industrial and teaching practice, which are the most important link in the system of professional training of future specialists.

Internships are focused on deepening, systematizing, generalizing and concretizing theoretical knowledge acquired at the university, and improving professionally significant skills and abilities. The base of production and pre-diploma internships under EP 6B05301 “Chemistry” includes a number of domestic production companies: Semey cement LLP, Kazakhstan Aluminum JSC, Kazzinc LLP, Kaustik JSC, Qazaq Astyk Group LLP, Silicate LLP " etc. Since OP 6B05301 “Chemistry” additionally has a pedagogical focus, students accordingly routinely undergo teaching practice in secondary schools and gymnasiums in the city of Semey (for example, No. 16, 39).

There is cooperation with domestic universities, such as NJSC "VKU named after Amanzholov", NJSC "Toraigyrov University", NJSC "ENU named after Gumilyov", etc. Every year, students enrolled in this EP have the opportunity to study for academic mobility at the above universities. There is also cooperation with foreign universities to implement an academic mobility program (Novosibirsk State Technical University, Altai State University, etc.). Scientists and lecturers from near and far abroad are invited annually (Professor V. Aseev, University of Helsinki; Professor R. Mammadov, Mugla University; Professor T. B. Yuzhakova, University of Pannonia, etc.)

2.4 Information about teaching staff implementing the educational program

The teaching staff of the Department of Chemistry and Ecology, ensuring the implementation of EP 6B05301 - Chemistry, consists of 9 people, including 2 candidates of chemical sciences, 1 candidate of biological sciences, 3 PhD doctors. The degree

of sedateness is 84%. All teachers of the educational program have a basic education and carry out teaching activities according to an individual plan, there are no deviations from the plan.

The department carries out the educational process at three levels of study: bachelor's, master's and PhD doctoral studies.

The qualified staff of teachers is able to provide high-quality educational process, meets the qualification requirements, level and specifics of the educational program. Among the teaching staff of the department, 3 are holders of the title “Best University Teacher”, 2 are holders of the State Scientific Scholarship for talented young scientists.

Teachers and students of the department are actively engaged in scientific activities.

The teaching staff of the department has high scientific and methodological publication activity. The results of the scientific activities of teachers are reflected in scientific publications with a high impact factor. Scientists of the Department of Chemical Engineering and Energy have the Hirsch index (h-index) in the Web of Science and Scopus databases.

№	Indicators	units of measurement	2024-2025 academic year	2025-2026 academic year	2026-2027 academic year	2027-2028 academic year
1	The share of teaching staff with an academic degree in EP	%	84	86	88	90
2	Including the share of teaching staff with a degree in the general education disciplines cycle	%	72	74	76	78

2.5 Characteristics of the achievements of the EP

- Demand for specialists with higher scientific and pedagogical education in the region;
- The share of graduates who studied under government orders and are employed in their specialty is 100%;
- Implementation of trilingual education according to the 50*20*30 model within the framework of this EP;

- Sufficient level of calmness; the share of full-time teaching staff with academic degrees and titles is 50%;
- High lecturing skills and mentoring and the presence of basic education of teaching staff;
- Application of innovative teaching methods by teachers during training sessions;
- Availability of continuity at three levels: bachelor's – master's – doctoral studies;
- Formation of practical skills of students taking into account the real needs of employers;
- Availability of educational laboratories equipped with laboratory equipment and instruments;
- The information and library collection in the specialty is complete, all disciplines are provided with educational, educational, methodological and scientific literature;
- Providing non-resident students with a hostel;

3. The main objectives of the EP development plan

The goals and objectives of the development of educational programs in the specialty 6B05301-"Chemistry" in accordance with the mission of the university are:

- providing professional training and personal development of a specialist with a high level of professional culture, capable of formulating and solving modern scientific and practical problems, having an idea of the current problems of chemistry and the chemical industry, including possible ways to solve them;
- filling the labor market with competitive chemists focused on professional growth, civic values, social responsibility and competencies in accordance with the requirements for this area of training;
- fulfillment of the social order of society for the development and formation of specialists in demand in the chemical sector;
- increasing the level of quality of education in accordance with the requirements of national and international standards based on the formation of motivation of students for professional improvement and self-realization;
- mastery of key, subject and professional competencies for subsequent successful professional activities;
- formation of students' readiness to organize and conduct research activities in the field of chemical science and industry.

4. Risk analysis of EP

The successful implementation of the educational program 6B05201 – Ecology can be influenced by different types of risks, and as a result, the graduating Department of Chemical Technology and Ecology has developed certain measures to reduce them.

№	Name of risks	Measures to eliminate
1	Decrease in the number of students enrolled in the Educational Program	Development of active career guidance activities (holding Olympiads, organizing meetings with graduates, employers) in secondary educational institutions and colleges of the city and region.
2	Insufficient level of language knowledge for the introduction of trilingual education	To increase the level of knowledge of a foreign language, the introduction of a foreign language course into the OOD block of EP. Organization of free foreign language courses for teaching staff with the involvement of leading university teachers and specialists in various foreign language courses. Also, speaking-clubs are held annually with invited native speakers from different countries (USA, Europe, etc.).
3	Decrease in the level of employment	Close cooperation with educational and scientific institutions, as well as manufacturing enterprises in the region in order to reduce the level of employment.
4	Insufficient development of external and internal academic mobility of students and teaching staff	Regularly, as part of cooperation between universities of the Republic of Kazakhstan, EP students study at partner universities. Negotiations are underway for the teaching staff of the department to undergo advanced training courses in countries near and far abroad. A number of teachers of the department are planned to enroll in the “Bolashak” program.
5	The risk of reducing the settling down of the Teaching staff by EP	The department conducts doctoral studies and every year teachers without a degree enter this program in order to improve their knowledge and skills, as well as with the prospect of increasing

		the degree of teaching staff in EP 6B05301 “Chemistry”.

5. Action plan for the development of the educational program

№	Criteria	Expected results	units of measurement	2024-2025	2025-2026	2026-2027	2027-2028
Direction 1. Educational and methodological support							
1.1	Updating the educational program based on professional standards, taking into account the recommendations of employers	Conducting an examination of the Educational program 6B05201 "Ecology" in order to increase the practice orientation and development of professional competencies of graduates	fact.	+	-	+	-
1.2	Monitoring and updating catalogs of elective disciplines in accordance with the development of key and professional competencies, the demands of the labor market	Improving the quality of the content of educational programs by including elective courses aimed at developing key and professional competencies of graduates in accordance with the demands of the labor market.	fact.	+	+	+	+
1.3	Introduction of modern learning technologies into the educational process, contributing to the development of cognitive activity, communicative ability of students	Improving the quality of teaching academic disciplines, taking into account the novelty and variety of forms of work that contribute to the development of cognitive activity.	fact.	+	+	+	+

1.3.1	Introduction of mass open online courses (MOOCs) into the educational process according to the educational program 6B05201 «Ecology»	Introduction of disciplines into the educational process Improving the quality of teaching academic disciplines, taking into account the novelty and diversity of forms of work that contribute to the development of cognitive activity.	unit	0	1	1	1
1.4	Involvement of social partners and employers in the development, examination of the implementation of educational programs	Improving the quality of educational programs implemented taking into account market demands and recommendations of employers	unit	1	1	2	2
1.5	Development and implementation of elective courses in English	Introduction of disciplines in English into the educational process	unit	1	1	2	2
1.6	Conducting seminars and round tables on the application of innovative technologies in the educational process	Introduction of innovative technologies in the educational process	unit	2	2	2	3
1.7	Publication of educational, methodical and scientific literature on the implemented educational program	Improvement of educational and methodological support in the disciplines of the implemented educational programs	unit	2	2	2	2
1.8	Conclusion of contracts with foreign and domestic partner universities in order to develop academic exchange of students of all levels and teaching staff	Creation of a database of foreign and domestic higher education institutions partner educational institutions for the development of academic exchange of students of all levels and teaching staff	unit	1	1	2	2
1.9	Inviting students from partner universities to study for a semester, short-term internships, internships and others	Development of international recognition of educational programs, implementation of academic mobility programs for students	number of people	0	1	1	1

1.10	Participation of teaching staff and students in international academic exchange programs	Development of international cooperation with foreign universities implementing educational programs in the field of Ecology	number of people	0	1	1	1
1.11	Development of outgoing academic mobility of teaching staff and students in the direction of "Ecology"	Improvement of the educational program based on the use of the experience of implementing such programs in leading foreign universities	number of people	1	1	2	2
Direction 2. Teaching staff							
2.1	Professional development and training of scientific and pedagogical personnel for the implementation of educational programs once every 5 years	The share of teaching staff who have passed advanced training at the national and international level is at least 20%	number of people	1	1	2	2
2.2	Advanced training, retraining, internships of teaching staff at the international level	Completion of at least 2 teachers of the advanced training program, retraining, internships of teaching staff at the international level	number of people	1	1	2	2
2.3	Promotion of publications of the works of teaching staff in international publications indexed by the Web of Science and Scopus databases	Increase in the share of teaching staff who have published the results of scientific research in publications indexed by the Web of Science and Scopus databases – at least 30% of the total number of teaching staff	%	20	25	30	35
2.4	Involvement of practical specialists in teaching and scientific activities	Participation in the implementation of educational programs of practitioners (at least 20% of specialists)	%	23	27	30	35
Direction 3. Internationalization of educational programs							

3.1	Conclusion of agreements on international cooperation with foreign universities	Implementation of joint projects, preparation of scientific publications with foreign partners, creation of bases for scientific internships of students	unit	1	1	2	2
3.2	Attracting foreign students to study under the educational program 6B05201 «Ecology»	Increasing the number of foreign students	number of people	0	1	1	1
3.3	Organization of joint scientific and practical events with international partners	Improving the efficiency of scientific and methodological activities of teaching staff, exchange of experience with foreign partners	unit	1	1	1	1
3.4	Invitation of foreign specialists to give lectures and consultations on master's projects and dissertations	Improvement of the content component of educational programs based on the introduction of the experience of foreign specialists in the implementation of educational programs	unit	1	2	2	2
3.5	Expansion of cooperation with Leading foreign scientific and educational organizations in order to attract the most qualified foreign specialists to the implementation of educational programs	Formation of key and professional competencies in accordance with the practice of leading universities	unit	1	2	2	2
Direction 4. Logistics and digitalization							
4.1	Step-by-step equipment of classrooms with technical training tools (projectors, panels, interactive and multimedia whiteboards, multifunction devices, webcam, projector screen, etc.)	Equipping classrooms assigned to the department with technical training tools (projectors, panels, interactive and multimedia whiteboards, multifunctional devices, webcam, projector screen, etc.)	unit	10	15	15	15

4.2	Automation of the educational process (testing, session management, student contingent movement, dean's office, department, teaching staff workload, schedule, library, syllabuses)	Information management based on the automation of the educational process (testing, session management, student body movement, dean's office, department, teaching staff workload, schedule, library, syllabuses)	fact.	+	+	+	+
4.3	Replenishment of the full-text database of research results of teaching staff and students, teaching staff (articles, monographs and others)	Increase in the number of results of scientific works of scientists, research of teaching staff and students, teaching staff (articles, monographs and others)	unit	5	7	9	10
4.4	Expansion of the fund of scientific and educational literature, including on electronic media for implemented educational programs	Ensuring the implementation of educational programs based on modern educational and information resources, including on electronic media	unit	20	20	25	25
4.5	Monitoring the content and improvement of the faculty's website	Formation of the faculty's website on various aspects of the implementation of educational programs.	%	70	80	100	100

Head of the Department _____ **Sabitova A.N.**

REVIEWED

at the meeting of the Commission on Academic Quality
of the Research School of Physical and Chemical Sciences
Protocol of the meeting No. 1 dated 06.06.2024
Chairman _____ Kassymova Zh.S.

AGREED

Dean _____ Kasymov A.B.
06.06.2024