



NJSC SHAKARIM UNIVERSITY OF SEMEY

DEVELOPMENT PLAN EDUCATIONAL PROGRAM

6B05301 - Chemistry

Semey

NON-PROFIT JOINT STOCK COMPANY "SHAKARIM UNIVERSITY OF SEMEY"

APPROVED

Board Member — Vice-Rector for Academic Affairs

I. Oralkanova

"25" 05 2023



EDUCATIONAL PROGRAM DEVELOPMENT PLAN

6B05301 – «Chemistry»

(EP code and name)

for 2023–2027

Semey 2023

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1. Passport of the Development Plan of the Bachelor's degree 6B05301 Chemistry (name of EP)

1	The basis for the development	The strategic plan of Shakarim University for 2021-2025. Faculty work plan
2	Terms of implementation	2023-2027 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 has been developed in accordance with the National Qualifications Framework and Professional Standards, according to the Dublin Descriptors and the European Qualifications Framework. The typical period of mastering the bachelor's degree program is 4 years.

EP "6B05301 Chemistry" was developed by the Academic Committee. Reviewed at the meeting of the Quality Assurance Commission of the Faculty of Engineering and Technology. (Protocol No.5 of 25.05.2023)

Approved at the meeting of the Academic Council of the University (Protocol No.9 of 12.06.2023).

The main criterion for the completion of the educational process is the development of at least 240 credits, with the award of a «Bachelor».

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 educational 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.

The training of specialists in EP «6B05301 – Chemistry» is carried out by the special department “Chemical Technology and Ecology” of the Faculty of Engineering and Technology (FET) on the basis of the Standard Rules for the activities of educational organizations implementing educational programs of higher and (or) postgraduate education. Order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 30, 2018, No. 595.

2.2 Information about students

Academic year The basis of training	2023-2024 academic year	2024-2025 academic year	2025-2026 academic year	2026-2027 academic year
Grant	23	25	30	33
Contract	0	3	3	3
Total	18	25	33	36

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 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.). Every year, academic lecturers from near and far abroad are invited (Professor V. Aseev, University of Helsinki; Professor R. Mammadov, Mugla University, etc.) for comprehensive training of students.

The employment of graduates in OP 6B05301 "Chemistry" averages 90-100% annually, this is due to the great demand for chemists in various sectors of the economy of the region and the republic.

2.4 Information about teaching staff implementing the educational program

The teaching staff of the Department of Chemical Technology 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 formation of scientific and pedagogical personnel at the department is carried out through training through master's programs, PhD doctoral studies, and advanced training of teaching staff. Currently, 10 masters are undergoing doctoral studies in the educational program "8D05301 – Chemistry".

EP teachers undergo advanced training at leading universities in Kazakhstan (according to the FPC plan) and training seminars conducted by the Ministry of Education and Science of the Republic of Kazakhstan, universities and other organizations. Teacher training is confirmed by certificates and certificates. The university teaching staff undergo scientific internships at universities near and far abroad, at universities and research institutes of the Republic of Kazakhstan.

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 scientific direction of the department is associated with research in the field of polymer complexes and their practical application for various purposes - the creation of biocompatible materials, in the fight against desertification, for reforestation, and water purification from radionuclides. The teaching staff of the Department of Chemistry and Energy successfully implements funded scientific projects. Over the past 5 years, 4 funded projects have been fully implemented, and 1 project is currently being implemented.

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	2023-2024 academic year	2024-2025 academic year	2025-2026 academic year	2026-2027 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;
- Active participation of teaching staff and students in cultural events.

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;
- developing students' readiness to organize and conduct research activities in the field of chemical science and industry

4. Risk analysis of EP

№	Name of risks	Measures to eliminate
1	Decrease in the number of EP students	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 to introduce trilingual education	To increase the level of knowledge of a foreign language, the introduction of a foreign language course into the GED 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

1.3.1	Introduction of mass open online courses (MOOCs) into the educational process according to the educational program 6B05301 – "Chemistry"	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	0	1	1	2	2	2	2
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	1	1	2	2	2	2
1.5	Development and implementation of elective courses in English	Introduction of disciplines in English into the educational process	unit	0	0	1	1	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	1	1	2	2	2	2	3	3
1.7	Publication of educational, methodical and scientific literature on the implemented EP	Improvement of educational and methodological support in the disciplines of the implemented educational programs	unit	1	1	2	2	1	1	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 partner universities for the development of academic exchange of students of all levels and teaching staff	unit	1	1	1	1	2	2	2	2
1.9	Inviting students from partner universities to study for a semester, short-term internships, internships, etc.	Development of international recognition of educational programs, implementation of academic mobility programs for students	number of people	0	0	1	1	1	1	2	2
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 direction 6B05301 - Chemistry	number of people	0	0	1	1	1	1	2	2
1.11	Development of outgoing academic mobility of teaching staff and students in the direction 6B05301 - Chemistry	Improvement of the educational program based on the use of the experience of implementing such programs in the leading universities of the Republic of Kazakhstan	number of people	1	1	1	1	2	2	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 level is at least 20%	number of people	0	0	1	1	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	0	0	1	1	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	%	15	15	20	20	25	25	30	30
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)	%	20	20	23	23	27	27	30	30
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	0	0	1	1	1	1	1	1
3.2	Attracting foreign students to study under the educational program 6B05301 – "Chemistry"	Increasing the number of foreign students	number of people	0	0	0	0	1	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	0	0	1	1	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	1	1	1	2	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	number of people	1	1	1	1	2	2	2	2

Direction 4. Logistics and digitalization											
4.1	Step-by-step equipping of classrooms with technical training tools (projectors, panels, interactive and multimedia whiteboards, multifunctional devices, webcam, projector screen, etc.)	Equipping classrooms assigned to the department with technical training tools (projectors, panels, interactive and multimedia boards, multifunctional devices, webcam, projector screen, etc.)	unit	5	5	10	10	15	15	15	15
4.2	Automation of the educational process (testing, session management, student contingent movement, dean's office, department, teaching staff load, schedule, library, syllabuses)	Information management based on the automation of the educational process (testing, session management, student contingent movement, dean's office, department, teaching staff load, schedule, library, syllabuses)	fact.	+	+	+	+	+	+	+	+
4.3	Replenishment of the full-text database of research results of teaching staff and students, teaching staff (articles, monographs, etc.)	Increase in the number of results of scientific works of scientists, research of teaching staff and students, teaching staff (articles, monographs, etc.)	unit	5	5	5	5	7	7	9	9
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	%	15	15	20	20	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.	%	50	50	70	70	80	80	100	100

Head of the Department Chemical technology and ecology A. Sabitova Sabitova A.N.

REVIEWED

at the meeting of the Quality Assurance Commission of the Faculty of Engineering and Technology

Protocol of the meeting No. 5 dated 05/25/2023

Chairman Abdilova G.B. Abdilova G.B.

AGREED

Dean of the Faculty Nurymkhan G.N. Nurymkhan G.N.

"25" May 2023

