NON-COMMERCIAL JOINT STOCK COMPANY
KAZAKH NATIONAL PEDAGOGICAL UNIVERSITY
NAMED AFTER ABAI

FACULTY OF SCIENCE AND GEOGRAPHY

APPROVED
Dean of the Faculty
K.D. Kaimuldinova
2023 y.

DEVELOPMENT PLAN OF THE EDUCATIONAL PROGRAM 7M0510-CHEMISTRY

2023-2029

ALMATY, 2023

The Development Plan of the Educational Program has been developed based on the following documents: On the Nationwide Priorities of the Republic of Kazakhstan until 2025 (Decree of the President of the Republic of Kazakhstan dated 26.02.2021 № 520) https://adilet.zan.kz/rus/docs/U2100000520/history Development Strategy «ABAI UNIVERSITY» 2023-2029 y.

https://www.kaznpu.kz/docs/docs/260224/Prog_ru.pdf

Approved
At the meeting of the Faculty Council of Natural Sciences and Geography
Minutes № 5 dated 25.01.2023

Reviewed
At the meeting of the Department of "Chemistry"
Minutes №6 dated 18.01.2023
Head of Department _____ Zh.S. Mukataeva

FOREWORD

Development Plan for the Educational Program 7M01510 – Chemistry for 2023–2029.

Code and Name of the Field of Education: 7M01 - Pedagogical Sciences
Code and Name of the Training Direction: 6B015 - Teacher Training in Natural Science Subjects
Group of Educational Programs: B012 - Teacher Training in Chemistry
The strategy of the program is aimed at forming and implementing the established competency model, as well as expanding the potential circle of employers.
Mission of the Educational Program: To train educators capable of anticipating the needs of modern education based on advanced methodologies, national heritage, and global approaches.
Goal of the Educational Program: To prepare highly qualified chemistry teachers with deep theoretical knowledge, modern research competencies, and practical skills to solve current scientific and technological challenges in chemistry.

ANALYSIS OF THE CURRENT SITUATION

General information about the educational program

Developers of the Educational Program Development Plan	**Representatives of the Department:** Mukataeva Zh.S., Korganbayeva Zh.K., Akylbekova T.N., Chinibaeva N.S. **Employers:** Nauryzbayev A.S., Director of Secondary School No. 26, Almaty Region, Ili District; Bidaibekova E.I., Director of Gymnasium School No. 159, Almaty; Shazhabayeva K.S., Director of Specialized Lyceum No. 92 named after Mahatma Gandhi, Almaty, Bostandyk District. **Students:** Galymova N., PhD student of the Chemistry Educational Program; Kuanishbay A., Master's student.
Academic Degree:	Master of Education in the Educational Program 7M01510 – Chemistry
Year of establishment:	2024
Language of Instruction:	Kazakh, Russian
Mode of study:	Full-time
Duration of Study:	2
Number of Credits:	120
Uniqueness of the educational program:	The Educational Program 7M01510 – Chemistry is distinguished by the fact that it has been developed considering the characteristics of the region and the strategic goals of the university. The program is aimed at training specialists in the field of chemistry who will be able to successfully address the challenges faced by the region and the university. **Advantages of the Educational Program:** 1. **Relevance and Demand for Knowledge.** The program covers a wide range of current topics and issues in chemistry, as well as innovative teaching methods, which ensures that graduates are in demand in the job market. 2. **Individual Approach to Education.** The program involves individual work with each master’s

	student, allowing them to develop their abilities and interests in the field of chemistry. 3. **Practical Orientation.** The educational program includes internships and practical training in schools, gymnasiums, and lyceums, which helps students apply their acquired knowledge in practice. 4. **Innovative Approach.** The program incorporates modern teaching methodologies and the latest technologies, contributing to the development of innovative thinking among the master's students.
Graduate Profile	✓ Able to design and carry out complex research, including interdisciplinary studies, based on a holistic systemic scientific worldview. ✓ Possesses deep knowledge in the field of chemistry, its teaching methodology, and modern educational technologies. ✓ Capable of developing and implementing innovative educational programs, integrating scientific research into the learning process, and fostering scientific thinking and environmental culture in students. ✓ Ability to lead others, be a leader, make independent decisions, and exhibit creativity and constructive social activity.
Types of Professional Activity	✓Research and Development ✓Research and Teaching ✓Project and Technological ✓Organizational and Managerial
Partners in Academic Mobility	**External Academic Mobility:** Pomorska Academy in Słupsk (Poland); University of Poitiers (France); Lille University (France); University of Lorraine (France); Heidelberg University (Germany); Adam Mickiewicz University (Poland); Mykolas Romeris University (Lithuania); Vilnius University (Lithuania); Vytautas Magnus University (Lithuania); University of Debrecen (Hungary); Nigde Omer Halisdemir University (Turkey); Muğla Sıtkı Koçman University (Turkey); Giresun University (Turkey); Fırat University (Turkey); Moscow City University of Pedagogy (Russia); Volgograd State Social-Pedagogical University (Russia). **Internal Academic Mobility:** Aktobe University named after S. Baizhanov; Atyrau University named after Kh. Dosmukhamedov; Aru University named after K. Zhubanova; Pavlodar Pedagogical University; Kyzylorda University named after Korkyt Ata.
Employment of Graduates	100%
Availability of an appendix to the license for the direction of personnel training	№ 0137373
Main enterprises with which cooperation is carried out:	KSU "Department of Education of Almaty City," GOU "Department of Education of Almaty Region," Secondary School No. 26, Almaty Region, Ili District, Gymnasium School No. 159, Almaty, KSU Specialized Lyceum No. 92 named after Mahatma Gandhi, Almaty, Bostandyk District, etc.
Expected Final Results of the Implementation of the Educational Program Development Plan	- Improvement of the educational and professional activities of students and faculty members (PPS); - Enhancement of the qualifications of PPS in the field of innovative teaching technologies;

	- Development of educational and methodological literature in English; - Participation of students and PPS in competitions and project implementation; - Improvement of the information and technical infrastructure; - Development and operation of joint educational programs with domestic and foreign universities; - Increase in the number of publications by PPS in high-ranking journals (Q1, Q2) Journal Citation Reports (JCR), WoS, Scopus; -Increase the proportion of PPS involved in research work.

Main Risks of the Educational Program

Name of the risk	Possible Consequences	Management mechanisms and measures
Competition in the Educational Services Market	Decreased Attractiveness of the Program, Outflow of Applicants to Other Universities	- Development of the uniqueness of the Educational Program (including modern technologies, artificial intelligence, digital laboratories, and sustainable development in chemistry). - Increasing the program's visibility through participation in educational exhibitions, forums, and social media. - Collaboration with employers and the Alumni Association to expand employment opportunities for graduates.
Formation of Public Opinion about the Program	Decrease in Trust in the Educational Program, Reduction in the Number of Students	- Promotion of successful graduates and their achievements in the media and on social networks. - Organization of open lectures, master classes, and webinars with industry experts. - Inclusion of elements of international accreditation and cooperation with foreign universities.
Contingent of students	Decrease in the Number of Incoming and Current Master's Students	- Implementation of active career guidance work in schools. - Expansion of grant opportunities and targeted educational programs. - Development of practice-oriented courses and internships for students. - Creation of a comfortable educational environment and support for student initiatives.
Economic Crisis	Decrease in Students' Payment Capacity, Increase in Expulsions	• Flexible payment system, providing installment plans. • Development of scholarship and financial support systems for students. • Inclusion of students in scientific and educational grant programs. • Organization of advisory support on educational funding issues.
Mismatch Between the Program Content and Labor Market Requirements	Graduates Lack the Necessary Competencies, Low Employment Rate	- Regular updating of the Educational Program in accordance with current employer requirements. - Introduction of courses on digital technologies, instructional design, and STEM education. - Active collaboration with employers, conducting internships and practical training.
Insufficient Level of Digitalization	Lag of the Program Behind Current Educational Trends	-Introduction of online courses, virtual laboratories, and artificial intelligence into the educational process. -Development of digital competencies for teachers.

		-Use of modern educational platforms and remote learning technologies.
Human Resource Risks	Insufficient Qualification of Teachers, Lack of Staff	- Development of a system for the professional development of teachers. - Involvement of industry practitioners for delivering lectures and seminars. - Motivation of teachers for scientific activities and participation in grants.
Low Student Motivation	Decrease in Academic Performance, High Staff Turnover in the Education System	- Inclusion of game-based technologies and project-based learning. - Organization of competitions, Olympiads, and hackathons in chemistry. - Development of mentoring and collaboration with successful graduates.

SWOT Analysis of Educational Program Implementation

	Strong sidesh	**Weak points**
Internal factors	- High level of training for graduates in the field of chemistry and pedagogy. - Programs integrated with the latest educational technologies (artificial intelligence, virtual laboratories). - Opportunities for internships at leading schools and universities. - Program content aligns with current requirements (STEM education, TPACK model). - Availability of strong scientific staff and practitioner-teachers. - Opportunities to participate in international educational programs, conferences, and grants.	-Insufficient funding for laboratory equipment and digital technologies. - Limited selection of elective courses on pedagogical innovations. - Low level of English proficiency among some students, limiting access to international research and internships. -Limited opportunities for dual education and internships abroad.
	Favorable Opportunities	**Threats and risks**
External factors	• Increasing demand for chemistry teachers with digital competencies and knowledge of modern teaching methods. • Development of online education and distance learning technologies, allowing for broader student reach. • Opportunities to participate in international grant programs (Erasmus+, etc.). • Active integration of sustainable chemistry into school curricula, making graduates in high demand. • Partnership with leading schools, educational platforms, and industries for practical student training.	- High competition from other universities and online educational platforms. - Economic instability affecting the number of grant and fee-paying students. - Low level of technology implementation in schools, which may reduce the relevance of the knowledge acquired by students.

1. MAIN OBJECTIVES OF THE EDUCATIONAL PROGRAM DEVELOPMENT

Direction 1. Expanding access to the university's educational services

№	**Performance Indicators**	Unit Change.	**2023**	**2024**	**2025**
1.	The contingent of students in the educational program 7M05301 – Chemistry.	Unit.	45	71	33
2.	Admission to the educational program.	Unit.	36	71	
3.	Graduation	Unit.	45		

Direction 2. Innovative support for educational activities

№	**Performance indicators (share, percentage, quantity)**	Unit change	**2023**	**2024**	**2025**	**Responsible executors**	**Form of completion**
1.	Decision-making on the type of educational program (existing, new, innovative, interdisciplinary, additional (minor), joint educational program)	Unit.	D -1	D– 1	D- 1	Graduating department	Educational Program
2.	Participation of the educational program in program rankings	Fact	+	+	+	Graduating department	Results of the educational program (EP) ranking
3.	Accreditation of the educational program	Fact			+	Graduating department	Accreditation result
4	Post-accreditation monitoring completion	Fact	+			Graduating department	onitoring results
5.	Updating the educational program in line with labor market requirements	Fact	+	+	+	Graduating department	pdated SOP, Expert opinions
6.	Analysis of the educational program for alignment with the university's strategic development plan	Fact	+	+	+	Graduating department	Minutes of department meetings
7.	Conducting roundtable discussions on integrating competencies into the educational process	Fact	+	+	+	Graduating department, employers	Certificate. Minutes
8.	Number of industry specialists involved in the educational process	Person	3	4	5	Graduating department	Agreements and memorandums
9.	Participation of potential stakeholder representatives as experts for the educational program	Fact	+	+	+	Graduating department, employers	Minutes of department meetings
10.	Analysis of the availability of faculty with the corresponding potential for the development of the educational program	%	100	100	100	Graduating department	Staffing form of the department's academic staff
11.	Number of faculty members who have completed professional development courses in the subject area	%	100	100	100	Graduating department, faculty	Certificates, diplomas
12.	Professional development and degree advancement of faculty through PhD studies and internships	Fact	+	+	+	Graduating department, faculty	Certificates, diplomas
13.	Development of digital knowledge and research competencies, enabling graduates to acquire expert-level IT competencies and skills in research activities.	Fact	+	+	+	Graduating department, faculty	Certificates, diplomas
14.	Provision of nanodegrees for future educators	Fact	+	+	+	Graduating department, faculty	Certificates, diplomas
15.	Improving the quality of faculty composition through the organization of Winter and Summer schools for faculty	Fact	+	+	+	Graduating department, faculty	Certificates, diplomas
16.	Organization of work within the framework of the “Silver University” to provide quality education for everyone, at any age. (Specializations to choose from: digital education, inclusive education, education based on digital technologies)	Fact	+	+	+	University, department,	Report

17.	Percentage of graduates of the educational program employed in the first year after graduation (out of the total number of graduates)	%	100	100	100	Graduating department	Employment results
18.	Percentage of graduates of the educational program who were trained under the state order and employed in the first year after graduation from the university in the respective educational program.	%	100	100	100	Graduating department	Employment results
19.	Percentage of university graduates participating in the evaluation of the quality of educational services (full-time education)	%	20	25	30	Graduating department	Presence in the composition of the commission
20.	Involvement of master's students in determining the content of the program	Fact	+	+	+	Graduating department, students	As part of the program developers
21.	The number of employers participating in the evaluation of the quality of specialist training	Unit.	2	5	5	Employers of the program	Agreements, memorandums, expert opinions
22	The share of students participating in the evaluation of the pedagogical activities of faculty	%	50	50	50	Graduating department, students	Survey results
23	The number of educational and methodical manuals developed in the Kazakh language	Unit.	4	5	7	Graduating department, students	Developments in the subjects
24	The number of educational and methodical publications developed by faculty based on the specifics of the educational program	Unit.	-	1	2	Graduating department	Educational and methodological publications, textbooks

Direction 3. Internationalization of the program

№	**Performance indicators (share, percentage, quantity)**	**Unit change**	**2023**	**2024**	**2025**	**Responsible executors**	**Form of completion.**
1.	Inter-university partnership within the program framework: Dual degree programs	Unit.	-	-	1	Graduating department	Joint educational programs, Double degree programs
	With a foreign university	Unit.	-	-	1		
	With a Kazakhstani university	Unit.	-	1	1		
2.	The number of students who completed research internships at leading foreign universities, research centers, and companies	Unit.	1	1	1	Graduating department	Responsible executors
3.	Number of students in the educational program participating in the internal outgoing academic mobility program.	Unit.	-	1	2	Graduating department, academic mobility center	Order, student transcript
4.	Number of students in the educational program participating in the internal incoming academic mobility program.	Unit.	-	1	1	Graduating department, student	Order, student transcript
5.	Number of faculty members participating in the internal outgoing academic mobility program.	Unit.	1	1	1	Graduating department, faculty, academic mobility center	Responsible executors
6	Number of faculty members participating in the internal incoming academic mobility program.	Unit.	1	1	1	Graduating department, faculty, academic	Report

						mobility center	
7.	Number of invited foreign scholars.	Unit.	-	1	1	Graduating department, faculty	Report
8.	Number of faculty members participating in the external outgoing academic mobility program.	Unit.	1	1	1	Graduating department, faculty, academic mobility center	Report
9.	Internships within international exchange programs (ERASMUS+, DAAD, Mevlana, Bolashak))	Unit.	-	1	1	Graduating department, faculty, academic mobility center	Report

Direction 4. Expansion of the scope of scientific research and innovations

№	**Performance indicators (share, percentage, quantity)**	**Unit change**	**2023**	**2024**	**2025**	**Responsible parties**	**Form of completion**
1.	Number of faculty members involved in educational and research projects	Unit.	2	2	3	Graduating Department**.**	Report
2.	Number of faculty members involved in the implementation of fundamental and applied research	Unit.	2	2	3	Graduating Department**.**	Report
3.	Number of publications in journals indexed in the 1st, 2nd, and 3rd quartiles according to the Journal Citation Reports by Clarivate Analytics or journals with a percentile rank based on CiteScore in the Scopus database.	Unit.	1	2	3	Graduating Department**.**	Base indicator
4.	Number of publications of doctoral students' research articles in journals with a non-zero impact factor, indexed in Thomson Reuters/Scopus databases.	Unit.	1	2	3	graduate department doctoral students.	Media information and social media links
5	International Scientific and Practical Conference "Modern Aspects of Chemical Science and Chemical Education: Theory and Practice," Almaty.	Fact	-	+	-	Graduating Department**.**	Media information and social media links
6	Round table "Path to Science" – Scientific and Methodological Seminar with Meetings of Outstanding Chemists and Scientists.	Fact	+	+	+	Graduating Department**.**	Information in the media and links on social media
7	Number of research projects conducted within the framework of international cooperation.	Unit.	1	1	1	Graduating Department**.**	report
8	Number of publications in publications recommended by the Committee for Control in Education and Science (CCES).	Unit.	3	6	8	Graduating Department**.**	report
9	Number of faculty members participating in the National "Best Teacher" competition.	Unit.	1	1	1	Graduating Department**.**	Results of the competition
10	Number of publications by students.	Fact	1	1	1	Student of the graduating department.	report

11	Number of students participating in scientific research and competitions.	Unit	1	1	1	Student of the graduating department	report
12	Operation of scientific centers and laboratories: • Organic Synthesis Laboratory • Physico-Chemical Methods of Research Laboratory • Inorganic Chemistry Laboratory • Analytical Chemistry Laboratory • Chemical Technology Laboratory • Petrochemistry and Organic Chemistry Laboratory	Fact	+	+	+	Student of the graduating department	Classroom Fund

Direction 5. Improvement of infrastructure and material-technical base.

№	**Performance indicators (share, percentage, quantity)**	**Unit change**	**2022**	**2023**	**2024**	**2025**	**Responsible parties**	**Form of completion**
1	Development of the computer park	Fact	+	+	+	+	Graduating department	Infrastructure modernization
2	Acquisition of software.	Fact	+	+	+	+	Graduating department	Infrastructure modernization
3	Acquisition of laboratory equipment and others.	Fact	+	+	+	+	Graduating department	Infrastructure modernization
4	Replenishment of the library collection.	Fact	+	+	+	+	Graduating department	Infrastructure modernization
5	Purchase of furniture.	Fact	+	+	+	+	Graduating department	Infrastructure modernization

Direction 6. Career guidance work within the framework of the educational program

№	**Performance indicators (share, percentage, quantity)**	**Unit change**	**2022**	**2023**	**2024**	**2025**	**Responsible executors**	**Form of completion**
1	Providing presentations to students and school teachers on online and offline platforms, a handout with information about this educational program, a list of subjects for the UNT, a list of documents required for admission, as well as the university's rating, its material and technical base and the possibility of admission to ABAI UNIVERSITY	Fact	+	+	+	+	Graduating department	Report, social media links
2	Meetings of the Council for Career Guidance and recruitment of applicants, organization of work of working groups in key areas.	Fact	-	+	+	+	Graduating department	Student body report
3	The round table "Career guidance is an investment in the future	Fact	+	+	+	+	Graduating department	Report

Direction 7. Educational work within the framework of the educational program

№	**Performance indicators (share, percentage, quantity).**	**Unit change**	**2022**	**2023**	**2024**	**2025**	**Responsible executors**	**Форма завершен**

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1	Carrying out events within the framework of the Programs and according to the plan of educational work of the Institute, active participation in the social life of the university	Fact	+	+	+	+	Graduating department	Report, social media links
2	Holding events focused on the national educational ideal, the system of basic national values (The Concept of the Great Abai "Tolyk Adam")	Fact	+	+	+	+	Graduating department	Report, social media links
3	Implementation of comprehensive measures: development of a training and talent development program, development of coaching, mentoring and mentoring methods, work of a social and psychological assistance service.	Fact	+	+	+	+	Graduating department	Report, social media links