NON-PROFIT JOINT-STOCK COMPANY
ABAI KAZAKH NATIONAL PEDAGOGICAL UNIVERSITY

Faculty of Mathematics, Physics and Computer Science
Department of «Methods of Teaching Mathematics, Physics and Computer Science»

«APPROVE»
Dean of the Faculty of MFI
Khamraev Sh.I.
«30» 04 2024 year

EDUCATIONAL PROGRAM DEVELOPMENT PLAN
7M01501 – «Mathematics»
for 2024-2029

Almaty, 2024

The development plan of the OP was developed on the basis of documents: The Law of the Republic of Kazakhstan dated July 27, 2007 No. 319-III "On Education", the Law of the Republic of Kazakhstan dated July 4, 2018 No. 171-VI "On Amendments and Additions to Certain Legislative Acts of the Republic of Kazakhstan on the expansion of academic and managerial independence of higher education institutions", the Law of the Republic of Kazakhstan dated December 27, 2019 Year No. 293-VI "On the status of a teacher" (https://adilet.zan.kz /) , "The development Program of the NAO Kazakh National Pedagogical University named after Abai for 2023-2029" (approved by the decision of the Board of Directors of the NAO KazNPU named after Abaya from 20.12.2023, No. 9 ave.) (https://www.kaznpu.kz/docs/docs/260224/Prog_ru.pdf)

Approved at the meeting of the Council of the Faculty of Mathematics, Physics and Computer Science.

Protocol № ___ from «___»_____202__ year.

Considered at the meeting of the department «Methods of teaching mathematics, physics and computer science».

Protocol № ___ ___ from «___»_____202 ___ year.

Head _____ A.E. Abylkassymova

PREFACE

Development plan of the educational program «7M01501 – Mathematics » for 2024-2029 years

Code and names of the field of education: 7M01 – Pedagogical sciences

Code and names of the direction of training: 7M015 – Training of teachers in natural science subjects

Group of educational programs: M010 **–** Training of mathematics teachers

The development program is aimed at the formation and implementation of an established competence model, as well as at expanding the possible range of employers.

The mission of the educational program: We train teachers who are able to anticipate the needs of modern education, based on advanced methods, national heritage and global approaches. We are increasing the prestige of the teaching profession and becoming a driver of human capital development.

The purpose of the educational program: Training of highly qualified scientific specialists who are competitive in the domestic and global labor market, who have the skills to organize research work in a new field of scientific research, analytical generalization of the results of scientific activity, allowing them to prepare qualified scientific work for the degree of Doctor of philosophy, obtaining fundamental, professional education, deep specialized knowledge in the chosen field of mathematics, which they allow us to successfully develop science.

The educational program development plan was developed taking into account the requirements of employers, in accordance with the national development priorities of the Republic of Kazakhstan until 2029 and the Development Program of the NAO «Kazakh National Pedagogical University named after Abai» for 2023-2029.

ANALYSIS OF THE CURRENT SITUATION

General information about the educational program

Developers of the OP development plan	Representatives of the department: Abylkasymova A.E., Nurmukhamedova J.M. Employers: Mekebaev N.O. – PhD, Head of the Department of Mathematics of the Kazakh National Women's Pedagogical University, Tashev A.T. – Doctor of Technical Sciences, Professor, Head of the Department of Logistics and Computer Technologies of the Kazakh Academy of Labor and Social Relations, Lysenko V.Yu. – Deputy Director of the Educational and Methodological Association of the State Committee for Scientific and Methodological Cooperation "Almaty College of Economics", K.A. Beisenbayeva – Ph.D., Acting Professor, Head of the Department of Automation and Computer Engineering at the Caspian Public University
Academic degree:	Master of Pedagogical Sciences in the educational program 7M01501-Mathematics
Year of opening:	2010
Language of instruction:	Kazakh, Russian
Form of training:	full-time
Duration of training:	2
Volume of loans:	120
Uniqueness of the OP	The educational program is aimed at training highly qualified specialists in the field of mathematical education who are able to develop innovative teaching methods and adapt to the dynamically changing requirements of the educational environment. The

	program has an enhanced research component, including an in-depth study of modern mathematical theories and their applied use in pedagogical practice. Special attention is paid to the integration of digital technologies into the educational process, preparation for work in an inclusive learning environment, as well as the development of competencies that promote interdisciplinary interaction. The program is aimed at training competitive research teachers with a high level of professional mobility and able to effectively solve current problems of mathematical education.
Graduate Model	- the ability to design and carry out comprehensive research, including interdisciplinary, based on a holistic systematic scientific worldview; - the ability to design pedagogical technologies for conducting all forms of the educational process at the university and apply the results of mastering the discipline in professional activities; - has the skills of socio-cultural and intercultural communication, ensuring the adequacy of social and professional contacts; - has an in-depth knowledge of modern mathematical problems and a willingness to propose and rationalize ways to solve them.; - emotional intelligence and emotional stability; - the ability to lead others, be a leader, and make independent decisions; - the ability for continuous professional growth and self-development.
Types of professional activity	1. Educational (pedagogical) 2. Educational and educational 3. Educational and technological 4. Social and pedagogical 5. Experimental research 6. Organizational and managerial 7. Information and communication technology
Employment of graduates	100%
Availability of an appendix to the license for the direction of training	№ KZ29LAA00018497, выданная 28 июля 2020 г., приложение к лицензии для занятия образовательной деятельностью
Expected final results of the implementation of the OP development plan	- Development of methods of teaching mathematics based on advanced scientific research and pedagogical approaches. - Formation of undergraduates' skills in scientific analysis and independent research in the field of mathematical education. - Strengthening international cooperation through publications in highly-rated journals and participation in international scientific events. - Increasing the level of academic mobility of students and teaching staff through internships and participation in international educational projects. - The introduction of modern digital tools and platforms into the educational process to increase its effectiveness. - The development of graduates' competencies that ensure their leadership positions in the scientific and educational environment.

	- Creating conditions for the integration of scientific developments into the practical activities of educational institutions. - Providing training for personnel capable of contributing to the development of the national education system through innovative methods of teaching mathematics.

The main risks of the educational program

Name of the risk	Possible consequences	Management mechanisms and measures
Low interest of applicants	Insufficient enrollment of students, reduced competitiveness of the program.	Active promotion of the program, expansion of partnership with leading universities, development of motivational measures to attract applicants
Weak integration of science and practice	The lack of implementation of the developed methods in the educational process, reducing the applied importance of research.	Creation of practice bases, cooperation with educational institutions, development of methodological recommendations and textbooks.
Insufficient funding for scientific research	Limited opportunities for conducting experiments, low publication activity.	Attracting grants, finding sponsors, and participating in international research projects.
Low level of digital maturity of students	Difficulties in mastering modern technologies, lag in professional training	Implementation of digital literacy courses, equipping laboratories with modern equipment, integration of digital technologies into the educational process.
Low motivation of students for research activities	Low quality of dissertations, reduced level of scientific achievements of the program.	Introduction of a system of incentives (grants, awards), support of publication activity, involvement in scientific projects.

SWOT- analysis of the implementation of educational programs

	Strengths	Weaknesses
Internal factors	Stable reputation in the market since 1928, dominant position in the market of professional and pedagogical education services of the republic The goals and development plan of the program are aimed at the formation and implementation of an established competence model, as well as at expanding the possible range of employers The status of a national university Strong faculty High level of employment for doctoral students Leading positions in national ratings and positioning in international ratings , The work of graduates in their specialty Continuous monitoring and periodic evaluation of programs.	– Lack of joint educational programs with foreign universities

Favorable opportunities		Threats and risks
External factors	Availability of a large fund of initiative research topics within which dissertation work can be carried out; Informing students about vacancies and internships and the situation on the labor market; The orientation of the individual towards the formation of the ability to self-education in various fields: educational and methodical, scientific activity, professional career; □ Development of distance learning technologies.	The pandemic Economic crisis The general trend of increasing the cost of paid education.

1. THE MAIN DIRECTIONS OF THE EDUCATIONAL PROGRAM DEVELOPMENT

Direction 1. Abai University – Center of Academic Excellence

Educational training programs for teaching staff have been developed in accordance with the professional standard "Teacher", National and Sectoral qualifications Frameworks in the field of education. The University is a leader in a project between the International Bank for Reconstruction and Development, the Government of Kazakhstan and the Ministry of Science and Higher Education (MES) to change the working environment of teachers in Kazakhstan, the core values and fundamental approaches to quality education.

The academic excellence of Abai University is promoted by the internationalization of the university, which is aimed at studying foreign experience, introducing the best international practices and the joint work of local experts, along with international ones. The academic and professional attractiveness of educational programs for international students, as well as the interest of foreign scientists and professors in the university's activities in order to improve the educational environment based on the study of the best global practices, has a positive effect on internationalization and will strengthen the academic reputation of Abai University.

Our priority is to meet the requirements for the quality of training, and the needs of students, employers, and other stakeholders. We consider the concept of quality as a process of creating and maintaining conditions that allow students to achieve certain educational goals and receive a high-quality education. It includes many aspects that interact with each other and have an impact on the educational process. One of them is the passage of specialized accreditation procedures, compliance of educational programs and services with established quality standards, confirmation of compliance with the requirements of accreditation bodies and the education system as a whole.

Goal 1. Implementation of an innovative model of teacher education

Task 1.1. To ensure the quality of educational services in the field of higher education

The task will be implemented by:

- modernization of the educational program content: updating curricula taking into account modern scientific achievements and international standards, the introduction of interdisciplinary modules and courses aimed at developing innovative competencies of mathematics teachers;

improving teaching methods and digitalization of the educational process: the introduction of modern digital technologies and tools (online platforms, VR/AR, artificial intelligence) into the educational process, the development of interactive teaching methods, project-based and problem-oriented learning;

- development of students' research activities: involvement of doctoral students in scientific research and international projects, development of a system of scientific publications in peer-reviewed journals and support for participation in conferences, organization of scientific seminars, discussion clubs and collaborations with leading universities;

- development of academic mobility and international cooperation: conclusion of partnership

agreements with leading domestic and foreign universities, attraction of foreign professors for lectures and seminars;
- improvement of the educational quality assessment and monitoring system: development and implementation of a feedback system from students and employers, regular updating of educational programs based on the results of internal and external expertise, introduction of independent knowledge assessment mechanisms (external testing, participation in international ratings and accreditations);
- formation of graduates' competitiveness: development of soft skills among doctoral students (leadership, communication, project management), organization of job training, startup design and career development; support of the Alumni Association.

Objective 1.2. To develop the internationalization of educational activities and ensure promotion in international rankings

The task will be implemented by:
- expansion of international cooperation: signing agreements with foreign universities and research centers for the implementation of joint educational and research projects, organization of academic exchange programs for doctoral students and teachers;
- improving academic mobility: participation of teachers and students in international scientific internships and conferences, attracting foreign scientists and teachers to give lectures and conduct master classes;
- development of publication activity: stimulating publications in highly rated international journals (Scopus, Web of Science), organizing scientific seminars and schools for the preparation of high-quality research articles, introducing English-language courses and modules into the educational process;
- participation in international ratings and accreditations: interaction with international accreditation agencies to complete the certification procedures of the educational program, monitoring the positions of the university and the educational program in international ratings and developing strategies for their improvement;
- integration into the international scientific community: organization of international conferences and forums at the university, involvement of doctoral students in international research projects and grant programs.

Objective 1.3. Expand access to MOOCs and global digital libraries

The task will be implemented by:

− increasing the share of educational programs that use global digital libraries.;

− integration of online Coursera platform courses into the curricula of educational programs;

− creating more comfortable working conditions for users and improving information and library quality of education on this basis;

− popularization of educational platforms of global digital libraries among students.

Goal 2. High level of stakeholder satisfaction

Objective 2.1. To create conditions for inclusive education

The task will be implemented by:

− creating conditions for physical barrier-free access in academic buildings, student dormitories and elevators for students with disabilities;

− when updating the curriculum, non-governmental organizations, public foundations, and public associations should be actively involved in the development of inclusive education.

Task 2.2. To implement the idea of lifelong learning

The task will be implemented by:
- development of a system of continuous professional development of teachers: organization of regular advanced training courses, master classes, seminars and webinars on modern methods of teaching mathematics, the inclusion of modules on innovative technologies and digital tools in the educational program, the development of a mentoring system for young teachers;
- formation of students' and graduates' sustainable motivation for continuous learning: development of individual educational trajectories that take into account professional interests and career ambitions, introduction of a system of micro-loans and certification programs for the development of new competencies, support for students' participation in scientific competitions, grant projects and Olympiads;

Objective 2.3. To provide career prospects for graduates

The task will be implemented by:
- development of partnerships with employers: conclusion of cooperation agreements with leading educational institutions, research centers and IT companies, holding meetings, round tables and job fairs with the participation of potential employers;
- improving the content of the educational program in accordance with the requirements of the labor market: regular monitoring of the requests of stakeholders (employers, graduates, students), adaptation of curricula taking into account current trends in mathematical education and pedagogy, the introduction of courses on the development of soft skills, project management and digital technologies;
- assistance in the employment of graduates: development of a career center at the university, organization of trainings on resume preparation, preparation for interviews and building a professional trajectory, formation and maintenance of a database of graduates and their career successes, support for startups and scientific developments of students in the field of mathematical education.

Direction 2. Abai University – Pedagogical Research University

The University is being transformed into a pedagogical research university, which will determine the agenda of scientific research in the field of education. For this purpose, the university has a high staff scientific potential: 6 professors were included in the Top 50 of the National General Ranking of Teaching staff of universities of the Republic of Kazakhstan in 2023. In 2022, 1 professor was awarded the title of "Best Researcher", 3 professors are holders of State scientific scholarships, 4 people are holders of scientific scholarships for talented young scientists. Holders of the title "Best University teacher" of the Republic of Kazakhstan in 2022 there are 3 employees. To increase the potential of the scientific personnel reserve, a pool of research professors and postdoctoral fellows is formed annually by way of competition. In 2023, 10 research professors and 20 postdoctoral fellows are working.

In 2022, the Department of the Moscow State Institute of Fine Arts implemented projects for basic research under the grant of the Ministry of Education and Science of the Republic of Kazakhstan under the leadership of: PhD, assoc.Professor Nurmukhamedova J.M., Ph.D., Professor Shokanov A.K.

In 2023, the department is implementing 5 research projects funded from the national budget (EOM RK), led by PhD, Professor Abylkasymova A.E., PhD Kyrykbaeva A.A. (2), PhD Ospanbekov E.A., PhD, Associate Professor Nametkulova F.D.

Within the framework of the competition for the award of small seed grants in 2022 and 2023, 30 million tenge was allocated annually for projects of young scientists (15 projects) for 15 million tenge, and 30 million tenge was allocated for 10 projects of teaching staff. In 2023, the

Department of the Moscow State Medical Academy is implementing projects led by PhD, Professor Abylkasymova A.E. and PhD Ardabayeva A.K.

One of the key indicators in international rankings is the publications of the faculty in scientific journals indexed in the Scopus database. There is also significant growth here: for example, in 2022, 14 articles were published in peer-reviewed foreign journals at the Moscow State Medical Academy Department of Education, in 2021 11 such publications were published. In 2022, the number of articles by the faculty in foreign journals indexed in Scopus was 10, in the Web of Science database – 1. In 2023 The number of articles published by the Faculty in foreign journals indexed in Scopus was 11 units.

The number of publications in journals recommended by the COC has increased: 23 articles in 2023, compared with 11 articles in 2022.

By the end of 2022, 113 scientific papers were published by the faculty of the Moscow State Institute of Fine Arts, 2 patents for industrial designs and technology were obtained, and 1 copyright certificate was obtained.

By the end of 2023, the faculty of the Moscow State Medical Academy Department published 132 scientific papers, received 1 patent for industrial designs, technology and 9 copyright certificates, which exceeds the figures of 2022.

In 2023, the International Forum of Young Teachers of Pedagogical Universities of the CIS countries "Young teacher of continuing pedagogical education: stages of professional development" was held, dedicated to the 95th anniversary of the University. The forum brought together young researchers, scientists and teachers from the CIS countries who discussed issues of professional development, development of professional competencies and methods of modern teaching in the system of continuing teacher education. Plenary sessions were held, where participants shared their experiences and best practices, discussed current trends and challenges in the field of teacher education. The article considers the status of a young teacher, the work of the Council of Young Researchers, innovative teaching methods that contribute to the successful education of modern youth, tools for training future teachers through Hyflex technology, and other issues.

Goal 1. Transformation into a pedagogical research university

Objective 1.1. To increase publication activity and citation, including through an international research network

The task will be implemented by:

− focusing on publications in the highly rated Q1, Q2 Journal Citation Reports (JCR), Q1, Q2 Web of Science, 50-99 percentile Scopus;

− wide coverage of teaching staff with measures to further implement the principles of academic integrity and research ethics at the institutional and academic levels based on the experience of international universities.

Task 1.2. To increase the scientific potential of teaching staff

The task will be implemented by:

− participation in competitions of the Ministry of Internal Affairs of the Republic of Kazakhstan for grant financing of scientific projects and program-targeted financing of science;

− the introduction of a system of financial and moral incentives for teaching staff and scientists for scientific achievements that affect the university's position in international and national rankings;

− participation of teaching staff in the annual competitions of the Ministry of Internal Affairs of the Republic of Kazakhstan for awarding the "Best Researcher" awards, state prizes and scholarships;

− activities to ensure scientific and professional growth (internships in the world's leading

scientific centers, scientific and academic exchange, and mobility);
− organization and holding of international and national conferences on the basis of the department;
− becoming one of the co-organizers of conferences held by foreign educational and scientific organizations;
− the entry of leading scientists of KazNPU named after Abai into the pool of external experts, among the members of the NNS;
− increasing the number of participants in the contests of the EOM of the Republic of Kazakhstan "Zhas Galim";
− attracting young scientists to scientific projects with grant funding and the PCF of the Ministry of Internal Affairs of the Republic of Kazakhstan;
− attracting researchers from the republican research institutes as executors of projects implemented by KazNPU named after Abai, as well as teachers, supervisors of undergraduates, scientific consultants of doctoral students.

Task 1.3. Increase revenues and commercialization of research results
The task will be implemented by:
− annual growth of scientific projects implemented at the University due to grant funding and the PCF of the Ministry of Internal Affairs of the Republic of Kazakhstan, at the expense of the university's own funds on a competitive basis;
− conclusion of agreements, contracts, and memorandums of cooperation with foreign partner universities in the field of science;
− participation of teaching staff and administrative staff in seminars to improve the skills of RNTD managers in accordance with international standards;
− search for partners and sponsors for RNNTD.

Direction 3. Abai University is a socially engaged university

The social engagement of students at the university is an important aspect of the educational environment. It covers such aspects as active participation in the academic and extracurricular life of the university, participation in student organizations, volunteering, participation in cultural and sports events, etc. High social engagement promotes the development of leadership, communication, organization, and social awareness skills among students.

As a result of the cooperation of student clubs with the State Fund for the Development of Youth Policy in Almaty, an initiative was implemented aimed at helping lonely elderly people in the Medeu district. The student Club "Niet" implemented the projects "Zhyly uya", "Shiragymyz sonbesin" and "Meyrimdilik – zhurekten", which were developed and implemented in order to help people in need and create a supportive environment for them.

In addition, in honor of the International Day of the Elderly, the university holds a traditional event called "Karttarym Kazynam". As part of this campaign, food baskets were distributed to the elderly to help them with their daily needs and express concern and respect for this age group. In general, joint projects and actions allow students to show care and social responsibility by helping people in need and participating in creating a favorable social environment. Such interaction contributes to the formation of an active civic position among students and strengthens ties between the university and local communities.

Sports play an important role at the university, and a wide variety of sports opportunities are available to students. The university actively supports and develops the sports movement, providing students with the opportunity to engage in physical activity and participate in competitions at various levels. The university has 20 sports clubs offering different types of sports. Sports clubs at our university provide students with the opportunity to practice various sports in a team or individual form. Some of them include football, basketball, volleyball, tennis, swimming, gymnastics, boxing, karate, badminton, athletics, chess and other popular sports. Sports clubs

provide students with the opportunity to actively participate in training under the guidance of experienced coaches, develop their physical abilities, improve technique and tactics in their chosen sport. They also organize participation in competitions and tournaments both within the university and at the regional, national and international levels.

On the basis of KazNPU named after Abai, there is a psychological service that provides a variety of services and support to students. She provides professional counseling and assistance in solving psychological problems related to studies, personal development, interpersonal relationships and other aspects of student life. The psychological Service provides individual consultations where students can discuss their difficulties, emotional problems or stressful situations. Psychologists provide support, help to develop skills of introspection, emotional regulation and stress management. To date, more than 1,000 consultations have been successfully conducted.

Goal 1. To create an educational environment conducive to the development of students' talents

Task 1.1 Create and maintain a supportive learning environment

The task will be implemented by:

− provision of psychological services;

− organization of events aimed at forming a community of active students with a high level of national consciousness and civic responsibility.

Objective 1.2. To involve students in social, professional, creative and sports activities

The task will be implemented by:

− popularization of social, professional, creative and sports activities among students.

Task 1.3. To develop students' essential skills

The task will be implemented by:

− organization of trainings and seminars on the development of communication skills, leadership, time management, creative thinking and other essential skills;

− support and development of student clubs and collectives in various creative fields such as music, dance, theater, literature and fine arts;

− support and develop cooperation with public organizations, government agencies and other partners in order to create new opportunities for students to participate in public activities;

− organization of competitions and grants to finance and support social projects of students.

Direction 4. Abai University – Friendly campus

The Abai University campus, located in the historical district of Almaty, is a cultural center of attraction for the citizens. The ecosystem of academic buildings, scientific laboratories, sports and socio-cultural facilities, dormitories, also includes architectural monuments that form the unique appearance of the university campus.

All facilities on the campus will be upgraded to ensure accessibility and unhindered movement for people with limited educational needs. The University will strengthen the development of the material and technical base by equipping classrooms, computer labs, scientific laboratories with innovative equipment, multimedia and software. A step-by-step transition to digitalization of scientific, educational and managerial activities of the university is underway.

KEY PERFORMANCE INDICATORS

Direction	Indicator	Target indicator (by 2029)
Education	Number of graduates of the program	An increase of 5-10% annually
	Student satisfaction level	At least 85%
	The share of disciplines with digital technologies	70%
Science and research	Participation of doctoral students in research projects (external financing of research)	10% annual growth
International cooperation	Number of international partnerships	At least 5
	Joint scientific projects	1 project
Infrastructure and resources	Modernization of educational and laboratory facilities	80% of the audiences have been updated