

**NON-PROFIT JOINT STOCK COMPANY
KAZAKH NATIONAL PEDAGOGICAL UNIVERSITY NAMED AFTER ABAYA**

INSTITUTE OF MATHEMATICS, PHYSICS AND INFORMATICS

**Institute director**
Sh.I. Khamraev
"31" 01 2022

**DEVELOPMENT PLAN
OF EDUCATIONAL PROGRAMS**

6B01506 - Physics and informatics

For 2022-2025y.

Almaty, 2022

The plan for the development of educational programs was developed on the basis of documents: on the national priorities of the Republic of Kazakhstan until 2025 (Decree of the President of the Republic of Kazakhstan dated February 26, 2021 No. 520) <https://adilet.zan.kz/rus/docs/U2100000520>, Development strategies "ABAI UNIVERSITY for 2022-2025" (approved by the Decision of the Board of Directors of NJSC KazNPU named after Abai dated December 09, 2021, order No. 12) https://abaiuniversity.edu.kz/docs/str_rus.pdf

Approved at a meeting of the Council of the Institute of Mathematics, Physics and Informatics

Minutes No. 5 dated "31" 01 2022

Considered at a meeting of the Department of Physics

Minutes No. 4 dated "27" 12 2021

Head of the Department  V.N. Kossov

Abai University focuses on the personality of the student, creates a harmonious educational space for mastering knowledge, professional socialization and adaptation, instills respect for the future profession, develops critical thinking skills and tolerance.

FOREWORD

Educational program development plan 6B01506 - Physics and informatics for 2022-2025.

Code and name of the field of education: 6B01 Pedagogical sciences

Code and name of the direction of training: 6B015-Teacher training in natural sciences

Group of educational programs: B015 Physics teacher training

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

Mission educational program: Training of teachers capable of anticipating the needs of modern education, based on advanced methods, national heritage and global approaches.

The purpose of the educational program: Training of teachers in physics and computer science with high social and civic responsibility, able to carry out professional activities in the following areas: education and formation of a comprehensively developed personality of the student; formation of systematized knowledge in the field of physics and informatics; organization of the educational process in physics and informatics at the modern scientific and methodological level; organization of project activities.

ANALYSIS OF THE CURRENT SITUATION

General information about the educational program

| | |
|---------------------------------------|--|
| Developers of the EP development plan | <u>Head of EP:</u> Kossov Vladimir Nikolaevich <u>Employees of the Department of Physics:</u> Khamraev Sherpedin Itakhunovich Alieva Moldir Ermekbaevna <u>Experts and employers:</u> Shileev Vyacheslav Georgievich <u>Students and graduates:</u> Shakirov Aman Kabdygalieva Laura Abilkyzy Burkitbaev Damir Bolatovich |
| Academic degree: | Bachelor of Education in Educational Program 6B01506 - Physics and informatics |
| Opening year: | Introduced into ESUVO 2019 |
| Teaching language: | Kazakh, Russian |
| Form of study: | full-time |
| Training period: | 4 |
| Volume of credits: | 240 |
| The uniqueness of the EP | Quality education through interaction with potential employers. Partnership under the academic mobility program. |
| Graduate Model | <ul style="list-style-type: none"> ✓ <i>Professional and pedagogical and social responsibility</i> ✓ <i>Clarity of goals and value orientations</i> ✓ <i>diligence, self-discipline, speech activity</i> ✓ <i>Emotional intelligence and emotional stability</i> ✓ <i>Practice-oriented and entrepreneurial skills</i> ✓ <i>Respect for historical and cultural heritage, tolerance</i> ✓ <i>Deep understanding of digital environments, new content creation skills</i> ✓ <i>multilingualism</i> ✓ <i>Ability for constructive interaction, adaptability to global challenges</i> ✓ <i>Ability to be a leader and make independent decisions</i> ✓ <i>Creativity, the ability to be creative and creative social</i> |

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| | <p><i>activity</i></p> <p>✓ <i>Ability for continuous professional growth and self-development</i></p> |
| Types of professional activity | <ol style="list-style-type: none"> 1. Educational (pedagogical): training and development of students, organization of the process of education and upbringing, design and management of the pedagogical process, diagnostics, correction, prediction of the results of pedagogical activity; 2. Educational: designing and managing the educational process of students, performing motivational, diagnostic, corrective, communicative, methodological work in the conditions of using modern pedagogical and information and communication technologies; 3. Educational and technological: study, generalization and dissemination of the experience of innovative education; 4. Socio-pedagogical: creation of favorable conditions and provision of humanitarian and pedagogical support for the full life, education and development of students; 5. Experimental research: conducting scientific research in the chosen direction and in related industries, as well as participation in all stages of design, implementation and maintenance of the results of scientific research; 6. Organizational and managerial: management and organization of the technological process based on physical research methods; 7. Information and communication: effective use of information and communication technologies on a scientific basis for organizing one's own work and self-study. |
| Academic mobility partners (internal and external) | <p><i>External academic mobility.</i></p> <p>Pomeranian Academy in Slupsk (Poland); University of Poitiers (France); Lille University (France); University of Lorraine (France); Heidelberg University (Germany); Adam Mickiewicz University (Poland); Mykolas-Romyris University (Lithuania); Vilnius University (Lithuania); Vytautas the Great University (Lithuania); University of Debrecen (Hungary); Nigde Omer Halisdemir University (Türkiye); MuğlaSıtkı Koçman üniversitesi (Türkiye); Giresun University (Türkiye); Firat University (Türkiye); Moscow City Pedagogical University (RF); Volgograd State Socio-Pedagogical University (RF).</p> <p><i>Internal academic mobility.</i></p> <p>Aktobe University named after S. Baisheva; Atyrau University named after Kh. Dosmukhamedov; ARU named after K. Zhubanov; Pavlodar Pedagogical University; Kyzylorda University named after KorkytAta.</p> |
| Employment of graduates | - |
| Availability of an application to the license for the direction of personnel training | № KZ29LAA00018497 |
| The main enterprises with which cooperation is carried out | KSU"Department of Educationcity of Almaty, GU "Department of Education of Almaty region»secondary school No. 26 Almaty region, Ili district, school - gymnasium No. 159 in Almaty, KSU specialized lyceum No. 92 named after Mahatma Gandhi, Almaty, Bostandyk district, etc. |
| Expected end results of the implementation of the EP development plan | <ul style="list-style-type: none"> - improving the educational and professional activities of students and teaching staff; - advanced training of teaching staff in the field of innovative learning technologies; -development of educational and educational-methodical literature; -development and operation of joint educational programs with domestic and foreign universities |

The main risks of the educational program

| Name of risk | Possible consequences | Mechanisms and controls |
|---|--|--|
| Competition in the market of educational services | Formation public opinion about this EP | Creation of a recognizable image of the educational program, increase in the number of university grants, positive feedback about this EP, trust, interest, activity of the Alumni Association (media appearances), advertising the quality of education ABAI UNIVERSITY to potential employers in order to increase the flow of interesting vacancies for our students and graduates. |
| Contingent of students | Reducing the contingent of students | implementation of a set of measures aimed at retaining the contingent, introducing more effective forms of career guidance work; systemic interaction with graduates after graduation, an increase in practice-oriented courses in EP |
| Economic crisis | Decrease in solvency | providing the possibility of phased payment of debts, individualization of education, motivation to continue education, individual and group psychological consultations. |

SWOT analysis of the implementation of educational programs

| | Strengths | Weak sides |
|------------------|--|---|
| Internal factors | <ul style="list-style-type: none"> - The goals and strategy of the program are aimed at the formation and implementation of the established competency model, as well as at expanding the possible circle of employers; - In-depth study of disciplines to achieve the required degree of qualification in the field of chemistry chosen by the student. - Highly qualified teaching staff; - Research activities carried out in accordance with the real needs of the enterprise; - Availability of a developed information infrastructure covering all types of activities; - Active position of the Student Council; - Marketing activity for effective interaction between the university and the employer; - High level of employment of graduates; - Practical orientation and a wide range of implemented EPs; - Availability of modern equipment and devices; - Work of graduates in their specialty - Student-oriented education; - Continuous monitoring and periodic evaluation of programs. | <ul style="list-style-type: none"> - Lack of joint educational programs with foreign universities; - Low activity of the Alumni Association and the absence of an endowment fund. |
| | Favorable Opportunities | Threats and risks |

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| External factors | <ul style="list-style-type: none"> - Using the opportunities of academic freedom; - The presence of a large initiative topics of research work, within which graduation papers can be performed; -Participation of teaching staff of the department in international educational exhibitions and fairs; -Informing students about vacancies and internships and the situation on the labor market; - Orientation of the individual to the formation of the ability to self-education in various fields: educational and scientific activities, creativity, professional career; -Sufficiently high level of effectiveness of educational activities, the growth of students' activity. -Development of distance educational technologies. | <ul style="list-style-type: none"> -High competition in the market of educational services; - Outflow of students; -Pandemic; -Economic crisis; -The general trend of increasing the cost of paid education. |
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1. MAIN OBJECTIVES OF THE DEVELOPMENT OF THE EDUCATIONAL PROGRAM

Direction 1. Expansion of access to educational services of the university

| No. | Outcome indicators | Unit rev. | 2022 | 2023 | 2024 | 2025 |
|-----|--|-----------|------|------|------|------|
| 1. | The contingent of students in EP 6B01506 - Physics and Informatics | Unit | 253 | 350 | 350 | 360 |
| 2. | Admission by EP | Unit | 80 | 90 | 95 | 100 |
| 3. | Release | Unit | - | 96 | 70 | 80 |

Direction 2. Innovative support for educational activities

| No. | Outcome indicators (share, percentage, number) | Unit rev. | 2022 | 2023 | 2024 | 2025 | Responsible executors | Completion Form |
|-----|---|-----------|-------|-------|-------|----------------|--------------------------------------|--|
| 1. | Deciding on the type of EP (current, new, innovative, interdisciplinary, additional (minor), joint EP | units | D - 1 | D - 1 | D - 1 | D - 1 SOP-1 | graduating department | OP, SOP |
| 2. | Participation of the EP in the ratings of the EP | fact | + | + | + | + | graduating department | OP rating results |
| 3. | EP Accreditation | fact | + | | | + | graduating department | Result Accreditation |
| 4. | Post-accreditation monitoring | fact | | + | | | graduating department | Monitoring results |
| 5. | Updating the EP taking into account the requirements of the labor market | fact | + | + | + | + | graduating department | updated OP, Expert opinion |
| 6. | Analysis of the EP for compliance with the strategic plan for the development of the university | fact | + | + | + | + | graduating department | Department meeting minutes |
| 7. | Conducting round tables on the introduction of competencies in the educational process | fact | + | + | + | + | graduating department, employers | Reference . protocol |
| 8. | The number of specialists involved in the educational process in the relevant industry | people | 3 | 3 | 4 | 5 | graduating department | Treaties, memorandums |
| 9. | Analysis of the availability of teaching staff with the corresponding potential for the development of EP | % | 100 | 100 | 100 | 100 | graduating department | The staff form of the teaching staff of the department |
| 10. | The number of teaching staff who completed advanced training courses in the subject area | % | 100 | 100 | 100 | 100 | graduating department teaching staff | Certificates, diplomas |
| 11. | Share of EP graduates employed in the first year after graduation (out of the total number of graduates) | % | 100 | 100 | 100 | 100 | graduating department | Employment results |
| 12. | The share of graduates of the EP, who studied under the state order, were | % | 100 | 100 | 100 | 100 | graduating department | Employment results |

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| | employed in the first year after graduation from the university under the EP | | | | | | | |
| 13 | The share of university graduates participating in the assessment of the quality of educational services (full-time education) | fact | + | + | + | + | graduating department | Presence in the commission |
| 14 | Availability of integrated curricula for management in inclusive education | fact | + | + | + | + | graduating department | report |
| 15 | To strengthen the potential of teacher education, the development of new educational programs | fact | - | + | + | + | graduating department | report |
| 16 | implementation of online courses (MOOCs) | fact | - | + | + | + | graduating department teaching staff | course development |
| 17 | To form a purposeful system of continuous work with gifted children and talented youth organization work In the project's boundaries "Kids university» | fact | - | + | + | + | graduating department teaching staff | report |
| 18. | Organization work within the "Life-long Learning" for quality education for everyone and at any age. | fact | - | + | + | + | graduating department | report |
| 19. | Participation of students in determining the content of the program | fact | + | + | + | + | graduating department, students | As part of the compilers of the OP |
| 20. | Number of employers involved in assessing the quality of training | units | 2 | 2 | 5 | 5 | OP's employers | Agreements, memorandums, expert opinions |
| 21. | The share of students participating in the assessment of teaching activities of teaching staff | % | 50 | 50 | 50 | 50 | graduating department students | Poll results |
| 22 | Number of teaching aids developed in the Kazakh language | units | 2 | 4 | 5 | 7 | graduating department students | Developments by disciplines |
| 23 | The number of educational and methodical publications developed by the teaching staff on the specifics of the EP | units | 1 | - | 1 | 2 | graduating department | educational and methodical publications, textbooks |
| 24 | Opening of pedagogical retraining courses for graduates of non-pedagogical specialties | fact | - | + | + | + | graduating department | Order on the admission of students |
| 25 | Preparing graduates for the NCT | fact | + | + | + | + | graduating department | Tubing certificates |
| 26 | To develop the digital ecosystem: create - the center of innovative educational digital technologies, which transforms traditional didactic models into innovative ones using digital educational technologies; - an online platform with access to video lectures, electronic interactive multimedia educational materials on the main special courses of educational programs; | fact | - | + | + | + | graduating department | |

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| <ul style="list-style-type: none"> - create author's courses for teaching staff at the leading republican platforms for open online education (EdTech-kz, Open Edx-kz, etc.) and include them in curricula; - gamification (the use of gaming techniques in the educational process, affecting the increase in the involvement and motivation of students); - development of MOOC platforms (massive open online courses); - using a monitoring and evaluation system based on the methods of Open-Book, Open-Paper, Critical Thinking, Take-Home exam; - use of proctoring technology using biometric data of students. | | | | | | | |
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Direction3. Program internationalization

| No. | Outcome indicators (share, percentage, number) | Unit rev. | 2022 | 2023 | 2024 | 2025 | Responsible executors | Completion Form |
|-----|--|-----------|------|------|------|------|---|-----------------------------|
| 1. | Interuniversity partnership within the EP: Double Degree Programs | units | - | - | - | 1 | graduating department | SOP, Double Degree Programs |
| | with a foreign university | units | - | - | - | 1 | | |
| | with a Kazakh university | units | - | - | 1 | 1 | | |
| 2. | The number of EP students participating in the program of internal outgoing academic mobility | units | - | - | 1 | 2 | graduating department, academic mobility center | Order, student transcript |
| 3. | The number of EP students participating in the program of internal incoming academic mobility | units | - | - | 1 | 1 | graduating department student | Order, student transcript |
| 4. | Number of teaching staff participating in the program of internal outgoing academic mobility | units | - | 1 | 1 | 1 | graduating department teaching staff | Order, report |
| 5. | The number of teaching staff participating in the program of internal incoming academic mobility | units | - | 1 | 1 | 1 | graduating department teaching staff | report |
| 6 | Number of attracted foreign scientists | units | - | - | 1 | 1 | graduating department | report |
| 7. | The number of teaching staff participating in the program of external outgoing academic mobility | units | - | 1 | 1 | 1 | graduating department teaching staff academic mobility center | report |

Direction 4. Expanding the scope of research and innovation

| No. | Outcome indicators (share, percentage, quantity) | Unit rev | 2022 | 2023 | 2024 | 2025 | Responsible executors | Completion Form |
|-----|--|----------|------|------|------|------|-----------------------|-----------------|
|-----|--|----------|------|------|------|------|-----------------------|-----------------|

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|--------|---|--------|---|---|---|---|--|--|
| 1. | Number of teaching staff involved in educational and research projects | people | 1 | 1 | 1 | 2 | graduating department | report |
| 2. | Number of teaching staff involved in the implementation of fundamental and applied research | people | 1 | 1 | 1 | 2 | graduating department | report |
| 3. | The number of publications in publications that are in the 1st, 2nd, and 3rd quartiles according to Clarivate Analytics' Journal Citation Reports or have a Cite Score percentile in the Scopus database | units | 1 | 1 | 1 | 2 | graduating department | Base indicator |
| 4. | The number of publications of scientific articles by doctoral students in journals with a non-zero impact factor included in the databases Thomson Reuters/Scopus | units | 1 | 1 | 2 | 3 | graduating department doctoral students | Database Metrics |
| 5 | International scientific and practical conference "Modern aspects of chemical science and chemical education: theory and practice". Almaty | fact | + | - | + | - | graduating department | magazine collection, Information in the media and links in social networks |
| 6 | Round table "The path to science" scientifically-methodical seminar meeting with outstanding chemists-scientists | fact | - | + | - | - | graduating department | Information in the media and links in social networks |
| 7 | Number of R&D carried out within the framework of international cooperation | units | - | - | 1 | 1 | graduating department | report |
| 8 | The number of teaching staff publications in publications recommended by the KKSON | units | 3 | 3 | 6 | 8 | graduating department | report |
| 9 | Number of teachers participating in the Republican competition The best teacher | units | - | 1 | 1 | 1 | graduating department | Competition result |
| 10 | Number of student publications | fact | + | + | + | + | graduating department student | report |
| eleven | Number of students participating in scientific research and competitions | units | - | 1 | 1 | 1 | graduating department student | report |
| 12 | Functioning of scientific centers, laboratories: <ul style="list-style-type: none"> • Laboratory of Organic Synthesis • Laboratory of Physical and Chemical Research Methods • Laboratory of inorganic chemistry • Laboratory of Analytical Chemistry • Chemical Technology Laboratory • Laboratory of petrochemistry and organics | fact | + | + | + | + | graduating department student | Audit Fund |

Direction 5. Improvement of infrastructure and material and technical base

| No. | Outcome indicators (share, percentage, number) | Unit rev. | 2022 | 2023 | 2024 | 2025 | Responsible executors | Completion Form |
|-----|--|-----------|------|------|------|------|-----------------------|------------------------------|
| 1 | Computer park development | fact | + | + | + | + | graduating department | infrastructure modernization |
| 2 | Software purchase | fact | + | + | + | + | graduating department | infrastructure modernization |
| 3 | Acquisition of laboratory equipment, etc. | fact | + | + | + | + | graduating department | infrastructure modernization |
| 4 | Replenishment of the library fund | fact | + | + | + | + | graduating department | infrastructure modernization |
| 5 | Purchase of furniture | fact | + | + | + | + | graduating department | infrastructure modernization |

Direction 6. Career guidance within the EP

| No. | Outcome indicators (share, percentage, number) | Unit rev. | 2022 | 2023 | 2024 | 2025 | Responsible executors | Completion Form |
|-----|---|-----------|------|------|------|------|---|----------------------------|
| 1 | Providing presentations to students and teachers of schools on online, offline platforms, handouts with information about this educational program, the list of subjects for passing the UNT, the list of documents required for admission, as well as the university rating, its material and technical base and the possibility of entering ABAI UNIVERSITY | fact | + | + | + | + | graduating department | Report, social media links |
| 2 | To identify talented students, the organization of circle work for students in grades 9-10-11 on the basis of practice in accordance with the student's area of interest | fact | - | + | + | + | graduating department, teaching staff, students | Memorandum, agreement |
| 3 | Conducting meetings of the department on career guidance and preparing the recruitment of applicants, organizing the work of working groups in key areas. | fact | + | + | + | + | graduating department | Student population report |
| 4 | Conducting online lessons with the help of teaching staff, providing methodological assistance in order to support Abay University graduates employed in rural areas | fact | - | + | + | + | graduating department | Report Protocol |
| 5 | During the internship, providing methodological support to teachers and students of secondary schools in competitions of scientific projects and olympiads | fact | + | + | + | + | graduating department | Report Protocol |
| 6 | Creation of a collection of video lessons in the direction "Introduction to Chemical Science" for secondary school students | fact | + | + | + | + | graduating department | Report Protocol |
| 7 | Implementation of the KIDS UNIVERSITY project | fact | - | + | + | + | graduating department | Report |
| 8 | Holding the event "Student for one day" to promote early self-determination of schoolchildren in choosing a profession | fact | + | + | + | + | graduating department | Report |

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|---|---|------|---|---|---|---|-----------------------|--------|
| 9 | Organization of a special competition among students of the second year of study at the "Bachelor's" level to create an Honors College (Excellent students of the university, an elite group of the most advanced students) | fact | - | + | + | + | graduating department | Report |
|---|---|------|---|---|---|---|-----------------------|--------|

Direction 7. Educational work within the framework of the EP

| No. | Outcome indicators (share, percentage, number) | Unit rev. | 2022 | 2023 | 2024 | 2025 | Responsible executors | Completion Form |
|-----|---|-----------|------|------|------|------|---------------------------------|----------------------------|
| 1 | Carrying out activities within the framework of the Programs and according to the educational work plan of the institute | fact | + | + | + | + | graduating department | Report, social media links |
| 2 | Activation of the social project of the nationwide volunteer movement "Accelerator of goodness: Izgilik elshysi" (attracting young people to volunteer, instills humanism, responsiveness, compassion, integrity and the spirit of Kazakhstani patriotism) | fact | + | + | + | + | graduating department | Report, social media links |
| 3 | Activities to promote integrity and anti-corruption values | fact | + | + | + | + | graduating department | Report |
| 4 | Opening HUB (hub) of student entrepreneurship, Involving students in professional tutoring, preparing children for Olympiads, organizing school-wide educational events, working with difficult teenagers, developing communication skills in Kazakh, Russian, English in the Speaking Club | fact | - | + | + | + | graduating department, students | Report |