

**MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE
REPUBLIC OF KAZAKHSTAN
NON-PROFIT JOINT-STOCK COMPANY "ALMATY UNIVERSITY OF
POWER ENGINEERING AND COMMUNICATIONS NAMED AFTER
GUMARBEK DAUKEYEV"
Institute of Automation and Information Technology**



**EDUCATIONAL PROGRAM DEVELOPMENT PLAN
8D07103– «AUTOMATION AND CONTROL»
for 2023–2028**

**Level of the basic educational program
(scientific and pedagogical direction)**

**Direction of training: 8D071 Engineering and Engineering Science
Group of educational programs: D100 Automation and Control**

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1. INFORMATION ABOUT THE MODULAR EDUCATIONAL PROGRAM

Modular educational program "8D07103- Automation and Control" was developed based on: National Qualifications Framework, approved by the protocol of March 16, 2016 by the Republican Tripartite Commission on Social Partnership and Regulation of Social and Labor Relations; State Compulsory Standard of Postgraduate Education, approved by the Decree of the Government of the Republic of Kazakhstan dated August 23, 2012 No. 1080 (set out with amendments in the wording of the Decree of the Government of the Republic of Kazakhstan. Order of the Minister of Education and Science of the Republic of Kazakhstan dated October 31, 2018 No. 604. Registered in the Ministry of Justice of the Republic of Kazakhstan on November 1, 2018 No. 17669.).

The educational program was developed at the Department of Automation and Control.

The educational program is designed to provide doctoral students with the necessary skills and competencies in organizing work in information technology and mastering the development of large-scale IT projects; resolving analytical issues and improving decision-making algorithms using artificial intelligence; testing, preventative maintenance, and monitoring automated systems, identifying weaknesses; identifying possible solutions for the automated object; preparing mathematical justification for the selection of hardware and software; analyzing incoming information on production and management processes; communicative skills, knowledge, and abilities in business communication; and understanding and the ability to apply project management tools in practice.

The purpose of the EP "8D07103 - Automation and Control" is the training of highly qualified scientific and teaching staff, proficient in modern design and research methods, capable of solving automation and control problems in various sectors of industry, education, and other areas of human activity.

Mission of the EP 8D07103 - Automation and Control The mission of the educational program, consistent with the current University Mission, management system, and Policy on Quality Assurance in Education and Science, is to train competitive specialists and scientists in the field of automation and control, capable of effectively participating in the modernization and implementation of industrial and innovative development in the Republic of Kazakhstan.

The doctoral training period is three years. Graduates of the program are awarded a PhD degree in the educational program "8D07103 - Automation and Control".

The University evaluates the effectiveness of the Educational Program Development Plan through a SWOT analysis. The results of the SWOT analysis serve as the basis for improving the educational program. The SWOT analysis for the Educational Program Development Plan is presented in Table 3.

Internal conditions for the development of the educational program: To train doctoral students in the "8D07103 – Automation and Control" program, the Department of Automation and Control has modern teaching and laboratory facilities, technical teaching aids, and visual and demonstration materials. The department boasts specialized teaching laboratories and a Thematic Research Laboratory "Cyber-Physical Systems and Smart Technologies," equipped with modern teaching aids and scientific instruments. Lecture halls are equipped with multimedia tools, standards, handouts, and other resources. All faculty members are provided with personal computers connected to the internet. The sanitary conditions of the teaching laboratories and classrooms comply with required regulatory documents. A laboratory passport has been prepared for each classroom.

To support doctoral students, faculty and staff, there is access to modern databases (Scopus, Clarivate Analytics, etc.) in the international database of scientific publications "Elsevier", "Scopus", and the opportunity to use the resources of the electronic libraries of other participants of the RMEB.

2. MECHANISMS FOR MANAGING THE EDUCATIONAL PROGRAM

The following planning mechanisms are used in the management of educational programs.

At the long-term planning level, overall priority areas and strategic goals for the development of all educational programs are identified, and indicators and performance indicators for specific programs are included. Long-term planning documents include the AUPET vision, mission, strategy, quality policy, and development plan. Short-term development plans for educational programs are based on these documents.

Short-term planning involves two levels.

1. At the university level, short-term planning is represented by AUES quality objectives, improvement plans, work plans for collegial bodies, and annual work plans by area. All of these documents, as well as the plans of structural divisions, address issues related to specialist training and address the challenges of implementing specific programs.

2. At the subdivision level, educational program development planning is reflected in the IAIT and the Automation and Control graduate department's quality objectives, institute plans, and department work plans. IAIT and the Automation and Control department plans must include deadlines for completing activities, responsible persons, and a column for recording completion. Short-term plans are required to be aligned with the university's mission, strategic goals, and objectives, and to include a section on operational improvement. This set of plans is the primary mechanism for developing educational programs and ensuring their quality. These plans consider educational, methodological, practice-oriented, and logistical aspects of educational program development. At the individual level, planning is represented by individual teaching staff plans.

Faculty and students must participate in the Bolashak international educational program of the President of the Republic of Kazakhstan, participate in the competition for travel grants for scientific conferences (seminars, congresses, forums), research internships funded by the Science Foundation of the Republic of Kazakhstan, the Erasmus+ international program, and the DAAD scholarship program. Implementation of the development plan will also be achieved through increased applied research, including through grant, program-targeted, and base funding from the Ministry of Education and Science of the Republic of Kazakhstan and the International Center for Research and Achievement in the Field of Applied and Agrarian Policy.

LIST OF ACTIVITIES OF THE IMPLEMENTATION PLAN OF THE EDUCATIONAL PROGRAM

For the successful implementation of the Development Plan of the educational program, the department "Automation and control" plans to systematically implement measures including:

- improvement of the educational program taking into account the opinions of potential employers and foreign experts;
- drawing up a plan for the publication of textbooks, teaching aids and methodological guidelines for the educational program;
- active implementation of academic mobility of students and teaching staff;
- expansion of scientific cooperation and partnerships with leading foreign universities and the conclusion of agreements with specialized enterprises for educational centers, attracting leading foreign scientists to carry out scientific research and lecture for doctoral students within the framework of the "visiting professor" program;

- increasing the number of teaching staff who speak a foreign language;
- submission of applications for competitions for scientific projects, the Ministry of Higher Education of the Republic of Kazakhstan, etc.;
- conclusion of additional business contracts for the NIA RK performed on order;
- implementation of scientific internships in the best foreign universities implementing educational programs in the field of automation and control;
- publication of scientific articles in journals included in the Clarivate Analytics, Scopus and Springer databases, in scientific journals with an impact factor;
- participation in the national ranking of specialties among universities of the Republic of Kazakhstan annually;
- concluding agreements with specialized enterprises for research internships and the performance of research and development work.

3. EDUCATIONAL PROGRAM DEVELOPMENT PLAN

Development plan of the EP “8D07103-Automation and Control” for 2023-2028 with an indication of activities, deadlines, responsible persons and implementation mechanisms is given in Table 1.

Table 1 – Development plan of the EP«8D07103 - Automation and Control»

N o.	Events	Completion form	Responsible persons	Execution deadlines
1	Implementation of educational programs that ensure continuous education of students	Inclusion of EP in the National Register of EP	University management, head of the department AU, head of the EP	2023-2028
2	Expanding relations with foreign partners for the purpose of implementing joint scientific research and publishing educational and methodological literature	Implementation of joint projects, publication of educational and methodological literature	University management, head of the department AU, head of the EP	2023-2028
3	Implementation of academic mobility of students and teachers	Study and internship at a foreign university	University management, head of the department AU, head of the EP	2023-2028
4	Increasing the number of faculty who have completed internships in foreign organizations (universities, research organizations)	Study and internship at a foreign university	Graduating department	2023-2028
5	Preparation and submission of projects carried out within the framework of international competitions and international higher education institutions	Project implementation	Head of the Department of AU, head of the EP.	2023-2028

6	Conducting international conferences, webinars and other events with the participation of foreign scientists	The proportion of doctoral students who participated in various activities	University management, head of the department AU, head of the EP	2023-2028
7	An increase in the number of scientific publications published in international scientific journals included in the database of foreign agencies	Publications of doctoral students and faculty	University management, head of the department AU, head of the EP	2023-2028

4. MEASURES TO REDUCE THE IMPACT OF RISKS FOR EP

Table 2 provides a list of measures to reduce risks arising during the implementation of the educational program.

Table 3 - SWOT analysis for the EP Development Plan «8D07103- Automation and Control»

Strengths	Weaknesses
<ul style="list-style-type: none"> • Training in new IT technologies attracts students. • The need from enterprises for specialists in this educational program. • Own buildings and logistics. • Stable financial position of the university. • Conducting fundamental and applied scientific research. • Favorable conditions for cultural and intellectual development, the formation of a healthy lifestyle for students and staff. • Interaction between the university and employers and relevant research institutes. 	<ul style="list-style-type: none"> • The university's broad international recognition is not ensured • Lack of graduation from the EP, which does not provide employment indicators • Intensive dynamics of changes in the external environment (socio-economic situation). • High cost of scientific and laboratory equipment and software. • Insufficient level of publications in international peer-reviewed journals. • The insufficient level of English proficiency among teaching staff prevents them from implementing international cooperation on a broad and effective basis. • Low level of popularization, stimulation and involvement of young teachers and students in the implementation of scientific projects and developments. • Weak publication activity of the teaching staff in journals indexed in Web of Science and Scopus in the field of the educational program • Low level of commercialization of innovative projects and scientific developments of both doctoral students and teaching staff • Weak interest on the part of industrial enterprises and businesses in the development and financing of scientific research.
Possibilities	Threats
<ul style="list-style-type: none"> • Advanced training for teaching staff on preferential terms in global companies. • Opportunity to enter into cooperation agreements with leading enterprises and companies in the 	<ul style="list-style-type: none"> • The outflow of specialists abroad in the field of automation and control. • Low level of motivation of scientific workers in the higher education system of the Republic of

<p>industrial and manufacturing sectors.</p> <ul style="list-style-type: none"> • The University is located in the center of Almaty, surrounded by several research institutes with similar fields, which allows for the effective use of their research facilities and scientific personnel potential. • Adaptation of the educational program to professional standards, taking into account the interests of key employers. • Development of international cooperation, academic mobility, double-degree/joint educational programs. • Prestige and demand for technical and IT specialties. • International accreditation of educational programs. • Active work in social networks. 	<p>Kazakhstan and devaluation of scientific degrees and titles.</p> <ul style="list-style-type: none"> • Frequent changes in requirements for doctoral students to defend their dissertations and publish in stronger international journals • A decrease in the number of degrees awarded due to the untimely defense of doctoral theses by doctoral students and the departure of older faculty with degrees. • Rapid changes in the labor market require adjustments to the EP. • Obsolescence of laboratory equipment, software and computer equipment. • The outflow of qualified teachers and scientists to other industries (commercial) with higher incomes, as well as to other universities. • An educational program cannot participate in the Atameken National Chamber of Entrepreneurs (NCE) rankings until it has graduated doctoral students, which may indirectly lead to a decrease in the number of applicants to the educational program.
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Head of the Department of AU



Abzhanova L.K.

Head of the EP

«8D07103- Automation and Control»



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