



NJSC SHAKARIM UNIVERSITY OF SEMEY

# **DEVELOPMENT PLAN EDUCATIONAL PROGRAM**

6B07104 - Automation and control

Semey



**CLAIM**

Member of the Board of Academic  
Affairs

I.A. Oralkanova

2023 y.

**EDUCATION PROGRAM DEVELOPMENT PLAN**

6B0710400 Automation and control

(EP code and name)

for the period 2023-2027

Semey 2023 y.

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**1. Passport of the Bachelor's/Master's Degree Educational Program Development Plan** 6B0710400 Automation and control  
 (name of the educational program)

1	The basis for the development	Strategic Plan of Shakarim University for 2021-2025 Faculty work plan
2	Developed by the Academic Committee of the Educational Program	Head of the AC: Nurymkhan G.N. EP manager Zolotov A.D. Members of the AC: Ospanov E.A. Kozhakhmetova D.O. Kolbin M.V. Kdirbaev A.N. Orynbasarov A.K. Masalimov A.A.
3	Terms of implementation	2023-2027 y
4	Expected results of implementation	Having mastered this educational program, graduates acquire the skills and abilities of theoretical and experimental research in complex engineering activities in the field of automation and control; apply progressive methods of operation of automation and control systems equipment, apply modern methods to develop energy-saving and environmentally friendly automation and control systems that ensure the safety of human life and their protection from possible consequences of accidents, disasters and natural disasters, gain knowledge and skills focused on the creation of robots and robotic systems with elements of artificial intelligence.

## 2. Analytical justification of the educational program

### 2.1 Information about the educational program

The educational program has been developed in accordance with the National Qualifications Framework and Professional Standards, according to the Dublin Descriptors and the European Qualifications Framework. The term of mastering the bachelor's degree program is 4 years.

The educational program "6B0710400 Automation and Control" was developed by the Academic Committee of the Faculty of Engineering and Technology

Reviewed at the meeting of the Quality Assurance Commission of the Faculty of Engineering and Technology (Protocol No. 4.6 of 10.04.2023)

Approved at the meeting of the Academic Council of the University (Protocol No. 8 dated 04/25/2023).

The main criterion for the completion of the educational process is the development of at least 240 credits, with the award of a Bachelor of Engineering and Technology degree in the educational program – Automation and Control.

The novelty of this program is its substantial uniqueness, which consists in the ability to combine the design and programming in one course of both control systems built on a modern element base, and the study of mechatronics – an applied science engaged in the development and operation of intelligent automated technical systems for their implementation in various spheres of human activity. Graduates of this educational program will master the latest means and methods of design, such as methods of artificial intelligence, digital information processing, modeling of complex dynamic systems and many others

### 2.2 Information about students

Academic year The basis of training	2023-2024 academic year	2024-2025 academic year	2025-2026 academic year	2026-2027 academic year
Grant	50	50	50	50
Contract	14	20	20	20
Total	64	70	70	70

### **2.3 Internal and external conditions for the development of the educational program**

To implement the above-mentioned purpose of the educational program, the department has the appropriate material and technical resources. 14 classrooms are involved: 1 lecture hall, equipped with an LSD projector and an interactive whiteboard, 5 computer classes with a LAN connection and unlimited Internet, 6 specialized laboratories. Thus, to date, the classroom fund of the department is sufficient for the successful implementation of the educational program plan, only it is necessary to improve the equipment

To attract students to research activities, there is a specialized laboratory (700 aud), which allows consolidating efforts to carry out scientific research. The financial resources of the educational program are provided by the university budget, as well as research and international projects. Information resources are at the disposal of the educational program and are represented by the library (including electronic publications), access to the Internet for all students and teaching staff, access to the local network of the university. There are open WI-FI zones. The personnel of the educational program is fully staffed, according to the educational program development plan, the provision of educational programs with educational and methodological complexes of disciplines is 100%. The work on mobility has been well done: Cooperation between Kazakh Universities has been expanded (NCSU, Gumilev ENU, EKTU named after Serikbayeva, Pavlodar State University. Toraighyrova, as a result of working on the project, it was possible to conclude memoranda and cooperation agreements with leading EU universities.

During the development of the educational program, employers took part in its discussion: Director of RTS - montazh LLP Kdirbaev A.N., director of Reltech LLP Shpuntov E.V., director of Kondiz LLP Talia V.S. .

According to the educational program, contracts for practical training have been concluded with Kazpoligraf LLP, Kondiz LLP, Teplokommunenergo LLP, and Spetsmontazhавтоматика LLP.

According to the dual training program, an agreement has been signed with the Research Institute of Radiation Medicine and Ecology.

### **2.4 Information about teaching staff implementing the educational program**

The staff of the teaching staff of the department for the 2023-2024 academic year is 28 people, including 5 people with academic degrees and titles. The number of full-time teaching staff with academic degrees and titles has been increasing in recent years. The teaching staff is being trained in the PhD doctoral program. In the 2nd year, one doctoral student is studying – T. Zhylkibaev, in the 1st year – two doctoral students. The personnel policy pursued by the management of the department and the university, which is aimed at creating conditions and assisting in admission to the target PhD-doctoral program, contributes to maintaining stability.

A number of teachers, such as Zolotov A.D., Kozhakhmetova D.O. have practical experience working at enterprises: associate professor Zolotov A.D. is an automation engineer at the Fedorovsky Gormolzavod of the Kostanay region, Kozhakhmetova D.O. in the pile of a Flour mill and feed mill.

In order to improve the quality of teaching disciplines, the teachers of the department implementing the OP are activating the introduction and further application in the educational process of new information technologies, multimedia learning tools, active learning tools and e-learning elements, which enable students to better assimilate educational material and consolidate knowledge

The teaching staff leading classes in the educational program has the necessary qualifications and level of education.

The number of full-time teaching staff conducting training sessions on this OP is 29 people. Including those with academic degrees and titles – 17, which is 57% of the total number of teachers among the teaching staff - doctors of technical sciences, candidates of sciences, PhD, masters. Associate Professor Zolotov A.D.. – Corresponding member of the International Academy of Informatization. For the achievements achieved at the University, PhD, Associate Professor Zolotov A.D. was awarded the Shakarim medal, the diploma of the Minister of Education of the Republic of Kazakhstan Ye. Sagadieva, Diploma of the Ministry of Education Nurbek.S., Associate Professor Ospanov E.A. – Diploma of the Ministry of Education Nurbek.Senior lecturer Myasoedov D.V. was awarded a letter of thanks from the akim of the city of Semey.

### **2.5 Characteristics of educational program achievements**

The main indicator of the effectiveness of the educational program is the proportion of employed graduates. The dynamics of the share of labor–built in recent years amounted to 90%, respectively, for the years 2018, 2019 – 100%, 2020 -75%, 2021 -89%, 2022-86%. The involvement of students in research is more than 65%. An important indicator of the relevance and relevance of educational programs, their compliance with modern trends in education is the academic mobility of students and teaching staff. In the direction of the development of academic mobility, students undergo scientific internships in foreign research centers: University of Economics, Bydgoszcz, Poland, Pamukkale University, Turkey. The university implements international projects in the field of education and science, such as: under the Erasmus+: KazDual program, on the introduction of dual education in Kazakhstan, under the Partnership Program of universities of the USA and Kazakhstan, the project "Improving Master's programs in Kazakhstan through the use of renewable energy technologies affecting poultry farming", where teachers participate educational program

### **3. The main objectives of the educational program development plan**

For the effective implementation of the OP , the following tasks are defined:

:

- to provide a level of education that meets modern requirements to develop independent thinking, the ability to self-development and self-education;
- provide conditions that take into account the individual and personal characteristics of the student;
- to create a creative atmosphere by organizing a system of electives, elective courses, clubs, sports sections, paid educational services;
- to form a positive motivation of students for learning activities.
- continue work on the organization and formation of specialized training

- to form a creatively working team of teachers;
- improve the work of methodological associations;
- to organize the study, implementation and improvement of technology and methods of diagnostics of the quality of education;
- organize the publication of creative and scientific works of teachers;
- . continue teachers' studies on the use of information technologies in the educational process.
- to improve the organization of the educational process:
- to improve the interaction of academic disciplines on the basis of integration;
- develop differentiation of learning, technology of problem-based learning;
- to introduce technologies that form key competencies into the educational process.

Expected final results of the implementation of the educational program development plan

1. Improving the quality of education
2. Improving the efficiency of the education system, continuous professional growth of the teaching staff of the department;
3. Modernization of personnel, information and resource, material and technical potential;
4. The demand for graduates of the educational program in the labor market.

#### 4. Risk analysis of the educational program

№	Name of risks	Measures to eliminate
1	Decrease in the number of students enrolled in the educational program	introduction of effective forms of career guidance (attracting startup students, meeting with parents of graduates at parent meetings, engaging in research, etc.); formation of a positive image of the OP (through the release of highly qualified specialists, the introduction of research results, etc.); improving the effectiveness of speaking in the media.
2	Insufficient level of knowledge of the language for the introduction of multilingualism	Opening of language courses
3	Decrease in the level of employment	Work on the development of dual education
4	Insufficient development of external and internal academic mobility of students and teaching staff	Conclusion of contracts with domestic and foreign universities.
5	The risk of reducing the settling of the teaching staff	Personnel training through PhD - doctoral studies



	according to the educational program	
6	In the field of supplementing the material and technical base with the requirements for the modern level of implementation of educational programs	In the field of supplementing the material and technical base with the requirements for the modern level of implementation of educational programs: the implementation of annual purchases of modern equipment, medium-term planning for the improvement of material and technical equipment; opening of new educational laboratories and classrooms. regular registration of applications for replenishment of the library fund; timely repair of educational laboratories.

### 5. Action plan for the development of the educational program


№	Criteria	Expected results	Е.д. изм.	2023- 2024	2024- 2025	2025- 2026	2026- 2027
<b>Direction 1 Educational and methodological support</b>							
1.1	Updating the educational program based on professional standards, taking into account the recommendations of employers	Conducting an examination of the Educational program "Automation and Management" in order to increase the practice orientation and development of professional competencies of graduates	факт		+		+
1.2	Monitoring and updating catalogs of elective disciplines in accordance with the development of key and professional competencies, the demands of the labor market.	Improving the quality of the content of educational programs by including elective courses aimed at developing the key and professional competencies of graduates in accordance with the demands of the labor market.	факт	+	+	+	+

1.3	Introduction of mass open online courses (MOOCs) in the educational program "Automation and Management" into the educational process	Introduction of disciplines into the educational process Improving the quality of teaching academic disciplines, taking into account the novelty and diversity of forms of work that contribute to the development of cognitive activity.	ед	1	1	1	1
1.4	Involvement of social partners and employers in the development, examination of the implementation of educational programs	Improving the quality of educational programs implemented taking into account market demands and recommendations of employers	ед	1	1	1	1
1.5	Development and implementation of elective courses in English	Introduction of disciplines in English into the educational process	ед			1	1
1.6	Conducting seminars and round tables on the application of innovative technologies in the educational process	Introduction of innovative technologies in the educational process	ед		1		1
1.7	Publication of educational, methodical and scientific literature on the implemented OP	Improvement of educational and methodological support in the disciplines of the implemented educational programs	ед	1	1	1	1
1.8	Inviting students from partner universities to study for a semester, short-term internships, internships, etc.	Development of international recognition of educational programs, implementation of academic mobility programs for students	чел		1	1	1
1.9	Participation of teaching staff and students in international academic exchange programs	Development of international cooperation with foreign universities implementing educational programs in the field of engineering	чел		1		1

<b>1.10</b>	Development of outgoing academic mobility of teaching staff and students in the field of engineering	Improving the educational program based on the experience of implementing such programs in leading universities of the Republic of Kazakhstan	цел		<b>1</b>		<b>1</b>
<b>Direction 2 Teaching staff</b>							
<b>2.1</b>	Professional development and training of scientific and pedagogical personnel for the implementation of educational programs once every 5 years	The share of teaching staff who have passed advanced training at the national level is at least 20%	цел	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>2.2</b>	Promotion of publications of the works of teaching staff in international publications indexed by the Web of Science and Scopus databases	Increase in the share of teaching staff who have published the results of scientific research in publications indexed by the Web of Science and Scopus databases – at least 10% of the total number of teaching staff	%	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>
<b>2.3</b>	Involvement of practical specialists in teaching and scientific activities	Participation in the implementation of educational programs of practitioners (at least 10% of specialists)	%	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>
<b>Direction 3 Internationalization of educational programs</b>							
<b>3.1</b>	Conclusion of agreements on international cooperation with foreign universities	Implementation of joint projects, preparation of scientific publications with foreign partners, creation of bases for scientific internships of students	ед		<b>1</b>	<b>1</b>	<b>1</b>
<b>3.2</b>	Attracting foreign students to study under the educational program "Automation and Management"	Increasing the number of foreign students	цел		<b>2</b>	<b>2</b>	<b>2</b>

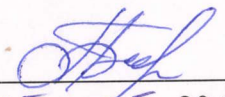
3.3	Organization of joint scientific and practical events with international partners	Improving the efficiency of scientific and methodological activities of teaching staff, exchange of experience with foreign partners	ед	1	1	1	1
3.4	Invitation of foreign specialists to give lectures and consultations on master's projects and dissertations	Improvement of the content component of educational programs based on the introduction of the experience of foreign specialists in the implementation of educational programs	ед		1		1
3.5	Expansion of cooperation with Leading foreign scientific and educational organizations in order to attract the most qualified foreign specialists to the implementation of educational programs	Formation of key and professional competencies in accordance with the practice of leading universities	чел	1		1	
<b>Direction 4 Logistics and digitalization</b>							
4.1	Step-by-step equipment of classrooms with technical training tools (projectors, panels, interactive and multimedia whiteboards, multifunction devices, webcam, projector screen)	Equipping classrooms assigned to the department with technical training tools (projectors, panels, interactive and multimedia whiteboards, multifunctional devices, webcam, projector screen)	ед	1	1	1	1
4.2	Automation of the educational process (testing, session management, student contingent movement, dean's office, department, teaching staff workload, schedule, library, syllabuses)	Information management based on the automation of the educational process (testing, session management, student body movement, dean's office, department, workload of the teaching staff schedule, library, syllabuses)	факт	+	+	+	+

4.3	Replenishment of full-text base of results of scientific researches of teaching staff and students, teaching staff (articles, monographs, etc.)	Increase in the number of results of scientific works of scientists, research of teaching staff and students, teaching staff (articles, monographs, etc.)	ед	2	2	2	2
4.4	Expansion of the fund of scientific and educational literature, including on electronic media on ongoing educational programs	Ensuring the implementation of educational programmes on the basis of modern educational and information resources, including on electronic media	%	10	10	10	10
4.5	Monitoring the content and improvement of the Faculty's website	Formation of the faculty website on various aspects of the implementation of educational programs?	%	100	100	100	100

Head of the Department  Kozhakhmetova D.O.

**REVIEWED**

At the Quality Assurance Commission meeting engineering

Commission Chairman  Abdilova G.B.

The protocol 05 from « 25 » 05 2023 r.

**AGREED**

Dean of the Faculty  Nurymkhan G.N.

« 25 » 05 2023 r.

