

**MINISTRY OF SCIENCE AND HIGHER EDUCATION  
REPUBLIC OF KAZAKHSTAN  
NON-PROFIT JOINT-STOCK COMPANY  
"ALMATY UNIVERSITY OF POWER ENGINEERING AND  
TELECOMMUNICATIONS  
NAMED AFTER GUMARBEK DAUKEEV"**

**Institute of Automation and Information Technology**



**DEVELOPMENT PLAN OF THE EDUCATIONAL PROGRAM  
7M06103 – “Computer Systems and Software Engineering”  
for 2023–2028**

**Level of the educational program  
(Scientific and pedagogical master's degree, level 7)**

**2023**

## **INFORMATION ABOUT THE MODULAR EDUCATIONAL PROGRAM**

Modular educational program “7M06103 - Computer Systems and Software Engineering” developed at the Department of IT Engineering based on the Law of the Republic of Kazakhstan "On Education" dated July 27, 2007 and regulatory documents:

- State license (unlimited) for educational activities No. KZ80LAA00018161 dated 05.05.2020 (primary license No. AB0137445 dated 04.08.2010);
- State compulsory standard of postgraduate education (order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022, No. 2);
- Model rules for the activities of an organization of higher and postgraduate education (order of the Minister of Education and Science of the Republic of Kazakhstan dated 06/09/2021 No. 282);
- Rules for organizing the educational process using credit technology of education (Order of the Ministry of Education and Science of the Republic of Kazakhstan dated April 20, 2011 No. 152, as amended on October 12, 2018 No. 563);
- Charter of "AUPET named after Gumarbek Daukeev";
- the 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), which regulates the requirements for a graduate with the academic degree of Master of Technical Sciences in the educational program “7M06103 - Computer Systems and Software Engineering” .

**The purpose of the EP "7M06103 - Computer Systems and Software Engineering":** is to train specialists in the field of software development who are competitive in the labor market and who are proficient in modern methods, tools, and technologies for developing software products for various purposes and who are capable of managing engineering activities and software packages in various areas of the industry.

**The mission of the EP "7M06103 - Computer Systems and Software Engineering"** is to provide high-quality education in the field of information systems to train specialists who have in-depth knowledge in the field of programming, software development, project management for the creation of software products and technological aspects of information technology.

The Scientific and pedagogical master's degree program lasts 2 years. Graduates of the educational program are awarded the degree of Master of Technical Sciences in Information and Communication Technologies under the educational program “7M06103 - Computer Systems and Software Engineering” .

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.

## **1. MECHANISMS FOR MANAGING THE EDUCATIONAL PROGRAM**

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

Short-term planning at the university level is represented by the AUPET named after Gumarbek Daukeev quality objectives, work plans for collegial bodies, and annual work plans in specific areas, which address program implementation issues. At the subdivision level, educational program development planning is reflected in the quality objectives of institutes and graduate departments, comprehensive institute plans, and department work plans. Institute and department plans must include deadlines for completing activities, responsible persons, and a column for recording completion. One of the requirements for short-term plans is their alignment with the university's mission, strategic goals, and objectives, as well as the inclusion of a section on operational improvement. This set of plans is the primary mechanism for developing educational programs and ensuring their quality. These plans address educational, methodological, practice-oriented, and logistical aspects of educational program development. At the individual level, planning is represented by individual faculty plans.

## **2. THE MAIN OBJECTIVES OF THE EDUCATIONAL PROGRAM DEVELOPMENT PLAN**

- management of high-quality implementation of the educational program and improvement of mechanisms for managing the educational process ;
- training of competitive personnel ;
- improving the conditions for high-quality staffing of the EP ;
- strengthening the role of research and innovation activities in the development of educational institutions;
- development of resource potential for the implementation of the EP .

## **3. EDUCATIONAL PROGRAM DEVELOPMENT PLAN**

Development plan for the educational program "7M06103 - Computer Systems and Software Engineering" for 2023–2028, indicating the activities, deadlines, responsible persons and implementation mechanisms, is given in Table 1.

## **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 1 – Development plan for the educational program "7M06103 - Computer Systems and Software Engineering"**

Areas of activity	Events	Responsible	Implementation mechanism	Deadlines
1	2	3	4	5
1. Managing the high-quality implementation of the educational program and improving the mechanisms for managing the educational process	1. Providing the OP with regulatory documents of the Ministry of Education and Science of the Republic of Kazakhstan: State Educational Standards, Municipal Unitary Enterprises, and Regional Unitary Enterprises with internal regulatory documents (Regulations, Instructions (forms )	University management, head of the ITE department , head of the educational program.	Formation of requests for the acquisition of regulatory documents in the Ministry of Education and Science of the Republic of Kazakhstan, RUMS. Working with the Department of Analysis and Strategic Development, the QMS Department.	2023-2028
	2. Improving the structure of the educational program. Updating the Modular Educational Program.	Head of the ITE Department , Head of the EP	The curriculum is updated annually by 15-20% based on a review of current international training practices in this area, employer requirements, and labor market demands. Employer needs, graduate satisfaction, and achievement of program outcomes are analyzed.	2023-2028,
	3. Development and improvement of the modular principle of formation of the OP.	Head of the ITE Department , Head of the EP	Developing modules based on the logical and substantive interconnections between disciplines. Ensuring a unified teaching method. Forming a contingent for independent study based on the integrated content of the educational material.	2023-2028
	4. Systematic improvement of the	Head of the	Annual updating of educational and	2023-2028

	educational and methodological support of the educational program	ITE Department , Academic staff,	methodological support taking into account the needs of employers, graduate satisfaction, and advanced training of teaching staff.	
	5. Cooperation with manufacturing companies and government agencies to attract specialists in the field of information systems, organize industrial internships and employ graduates.	Head of the ITE Department , Head of the EP, Academic staff, Department of Internship and Employment	Conducting master classes, roundtables, and scientific seminars with leading companies. Participating in organizing industrial internships. Analyzing the demand for young specialists in various industries.	2023-2028
2. Training competitive personnel	1. Development and improvement of the CED taking into account the proposals of stakeholders	Head of the ITE Department , Head of the EP	Interaction with employers. Annual updates of the Modular Educational Plan's disciplines based on employer suggestions, research results, and faculty development.	2023-2028
	2. Development and implementation of a program for multilingual training of specialists in OP	University management, head of the ITE department , Head of the EP, Academic staff,	Development of programs, improvement of teaching staff qualifications and level of knowledge of foreign languages (up to 40% by 2028).	2023-2028
	3. Development and implementation of innovative teaching methods	Head of the ITE Department , IAIT Management,	Advanced training of teaching staff. Discussion of issues related to improving teaching methods at the department's methodological seminars and Institute. Using interactive teaching methods	2023-2028

		Head of the EP		
	4. Formation of a high-quality contingent of students	Head of the ITE Department, IAIT, Applicant Recruitment Department	Career guidance plan, constant updating of the department's website, and conducting faculty consultations at the admissions office.	2023-2028
	5. Implementation of academic mobility of students and teachers	Head of the ITE Department, IAIT management, Academic staff, international cooperation department	Student training and faculty internships at foreign universities. Expanding the list of partner universities. Implementing dual-degree education.	2023-2028
3. Improving the conditions for high-quality staffing of the EP	1. Increasing the percentage of faculty members with PhD degrees to 75% through PhD studies, internships, and attracting foreign faculty with academic degrees.	of the ITE Department, University Administration Department of Science and Commercialization	Improving the qualifications of teaching staff, motivating young teachers to enroll in doctoral studies, and attracting the most competent graduates to teaching and research activities PhD doctoral programs. Plan for inviting foreign scholars to teach courses and organize joint research projects.	2023-2028
4. Strengthening the role of research and innovation activities in the	1. Enhancement of scientific research at the department . Participation in grant and	Head of the ITE Department ,	Involvement of faculty and students in proactive, funded research projects. Increased number of innovative projects, including the	2023-2028

development of educational institutions.	contractual research and projects. Expanding ties with international partners for the purpose of implementing joint scientific research and publishing educational and methodological literature.	Academic staff	filing of innovative patent applications and their application, integration of results into the educational process, and publication in high-income and internationally ranked journals.	
	2. Achieving commercialization of the results of scientific research of the department's teaching staff	Head of the ITE Department, Department of Science and Commercialization, Academic staff	Increasing the number of scientific projects and programs implemented jointly with national companies and private enterprises.	2023-2028
	3. Stimulating and motivating students to actively participate in scientific activities	Head of the ITE Department, Academic staff	Student participation in national and international competitions. Involvement of students in departmental research. Increasing the number of students studying in funded research projects.	2023-2028
	4. Increase in publications of faculty and doctoral students in journals with a non-zero impact factor	Head of the ITE Department, Academic staff	Preparation of scientific publications in journals with an impact factor that are included in the international scientometric databases Tomson Reuters, Scopus.	2023-2028
5. Development of resource potential for the implementation of the EP	1. Purchase of new laboratory equipment	Head of the ITE Department, Academic staff	Annual procurement plans	2023-2028
	2. Purchase of office equipment, scientific equipment, technical	Head of the ITE	Annual procurement plans	2023-2028

	teaching aids, visual aids, etc.	Department , Head of the EP		
	3. Development of the department's information and educational resources (website, portal, electronic teaching and methodological materials, etc.)	Head of the ITE Department , Academic staff, Department of Information Technology,	Activities to develop the university's information and educational resources	2023-2028
	4. Development of various forms of material and moral incentives for teaching staff	Head of the ITE Department	PPP rating	2023-2028
	5. Opening of thematic laboratories from leading companies, manufacturers of innovative equipment	Head of the ITE Department , Head of the EP	Conclusion of contracts, provision of audiences.	2023-2028

**Table 2 – Risk Reduction Action Plan**

<b>Item No.</b>	<b>Name of possible risks</b>	<b>Measures to eliminate them</b>
1	Insufficient supply of new educational and methodological literature on professional disciplines in the state language.	Plan the annual publication of scientific and educational literature by department faculty in accordance with the working curriculum. Intensify the work of the faculty on developing and implementing educational literature in the state language into the educational process.
2	Decrease in the number of students studying in the educational program, outflow to other universities	Developing a comprehensive career guidance plan for schools and colleges in Almaty and other regions. Organizing joint scientific and educational projects with schoolchildren, including master classes in schools and colleges and Olympiads. Active engagement on social media.
3	Insufficient knowledge of foreign languages by applicants	Conducting a diagnostic test of foreign language proficiency among first-year students. Motivating students with the opportunity to participate in academic mobility programs at the University's international partner universities.
4	Decline in the quality of education due to low level of knowledge in natural sciences upon admission	Raising the admission threshold for grant-funded programs. Conducting preparatory courses for applicants. Screening and outreach to potential applicants at schools.
5	Rapid obsolescence of the existing material and technical base	Timely and planned procurement of modern equipment. Agreements with enterprises enabling the joint use of their laboratory facilities in the educational process.
6	The obsolescence of traditional teaching methods	Improve and implement innovative teaching technologies into the educational process. Update existing teaching aids.
7	Increase in the average age of teaching staff and scientific personnel	Training highly qualified scientific personnel through master's and doctoral (PhD) programs in line with modern requirements. Recruiting young professionals with advanced degrees and/or master's degrees. Creating favorable conditions for the career advancement of young specialists.
8	Weak activity of the teaching staff in publishing scientific papers in journals with a high citation index	Develop a publication plan for faculty members in KKSON journals and international publications with a non-zero impact factor. Actively participate in

		competitions announced by the Ministries of the Republic of Kazakhstan and international organizations for grants for funded research projects.
9	Termination of cooperation agreements with industrial partners	Timely conclusion of new contracts with leading industry companies for internships/training and subsequent employment (with prolongation).
10	High competition for educational programs with other universities	Participation in national, regional, and state international rankings, such as Atameken. Analysis of similar educational programs implemented at other universities.

**Table 3 - SWOT analysis for the Development Plan of the educational program "7M06103 - Computer Systems and Software Engineering"**

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• The educational program was developed jointly with employers.</li> <li>• Availability of 3 independent learning paths (specializations)</li> <li>• Provision of modern equipment for educational laboratories.</li> <li>• Availability of departmental competence centers with global vendors.</li> <li>• Qualified teaching staff.</li> <li>• Involvement of practicing specialists with extensive experience working at large enterprises in various industries in the educational process as teaching staff.</li> <li>• Established relationships with industrial enterprises enable the implementation of research and development results into production processes.</li> <li>• A well-developed social support policy for students (tuition discounts, incentives for winning Olympiads, competitions, and scientific research, payments from the Board of Trustees, and a grant and scholarship from Gumarbek Daukeev).</li> <li>• Use of innovative teaching methods on a continuous basis.</li> </ul>	<ul style="list-style-type: none"> <li>• Not all regions have partners for students to undergo all types of practical training.</li> <li>• Insufficient level of publications in international peer-reviewed journals.</li> <li>• Aging of the teaching staff and practitioners, low staff turnover.</li> <li>• The insufficient level of English proficiency among teaching staff prevents them from implementing international cooperation on a broad and effective basis.</li> <li>• Insufficient provision of the educational process with educational literature in the state and English languages.</li> <li>• Low level of popularization, stimulation and involvement of young teachers and students in the implementation of scientific projects and developments.</li> <li>• Low publication activity of faculty and students.</li> <li>• Low academic mobility of students.</li> </ul>
<b>Possibilities</b>	<b>Threats</b>
	<ul style="list-style-type: none"> <li>-Deterioration in the quality of the student body due to the low level of preparation of schoolchildren and college graduates.</li> <li>-Exodus of qualified teachers and scientists to higher-income sectors (commercial) and to other universities.</li> <li>-Exodus of strong students to other universities, including foreign ones.</li> </ul>

**Head of Department ITE**



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