DEVELOPMENT PLAN
EDUCATIONAL PROGRAM

6B06106 - SMART systems and programming

Semey

NJSC «SHAKARIM UNIVERSITY OF SEMEY»

APPROVED

Board member- Vice- rector for academic affairs

_____ I.Oralkanova
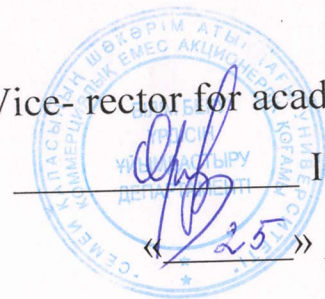
«____25____» ____05____ 2023

EDUCATIONAL PROGRAM DEVELOPMENT PLAN

6B06106 «Smart system and programming»

(code and name of educational program)

2023-2027

Semey 2023

Content

1. Passport of the Development Plan of the Bachelor's degree program 6B06106 - SMART systems and programming

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 AK:* Nurimkhan Gulnur Nesiptaevna Dean of the Faculty of Engineering and Technology, Candidate of Technical Sciences. *Manager of the educational program:* Bekbayeva R.S., Candidate of Technical Sciences, Acting Associate Professor *AK members:* Kozhakhmetova D.O., Head of the Department, PhD E.T. Zhanuzakov, senior lecturer *Employers:* Zenkovich V.A., Head of the technical Department of the Institution "Kazakh Center for Network Information Bekenov A.S., Head of IP "Title Agency" *Students:* Zhumashova A.M. – student of the VT-101 group Tleboldy U.K. - student of the VT-101 group
3	Terms of implementation	2023-2027
4	Expected results of implementation	Training of specialists who are competitive in the labor market, have high personal characteristics and broad fundamental and applied knowledge in the field of information and communication technologies. The program is aimed at the formation of qualified specialists equipped with the competencies necessary for successful competition in the labor market. It also aims to develop students' personal qualities, such as creativity, sociability, analytical thinking and the ability to work in a team. Within the framework of the program, students will receive a wide range of fundamental and applied knowledge, including programming, architecture of computer systems, databases, algorithms, data structures, development of web applications, mobile applications and applications for smart systems. They will be ready for successful work in the field of information and communication technologies, having confidence in their skills and abilities, as well as understanding the current requirements and trends of the industry.

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 Euro-Educational Program of the European Qualifications Framework. The typical period of mastering the bachelor's degree program is 3 years.

The EDUCATIONAL PROGRAM "6B06106 - SMART systems and programming" was developed by the Academic Committee.

It was considered 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's degree in information and communication technologies under the educational program "6B06106 - SMART systems and programming".

The uniqueness of the program lies in the opportunity for students to participate in scientific programs, startup projects, to realize their creative possibilities through scientific research, creative projects, sports and educational programs, as well as to continue further studies in master's and doctoral studies.

2.2 Information about students

Academic year / The basis of training	2022-2023 academic year	2023-2024 academic year	2024-2025 academic year	2025-2026 academic year
Grant	30	30	30	30
Contract	25	25	25	25
Total	55	55	55	55

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

The academic policy of the Department of Automation, Information Technology and Urban Planning, which implements the educational program "6B06106 - SMART systems and Programming", is aimed at using innovative teaching technologies based on the best practice of teaching modern general education, basic and profile disciplines, on the quality of teaching using

modern learning strategies, modern teaching methods in higher education. Students and teaching staff of the Department of Automation, Information Technology and Urban Planning have unlimited access to information and educational resources and electronic library systems necessary to perform independent educational and research work. Electronic information resources: full access to databases – Scopus, ScienceDirect, the Electronic Library System "Polpred", Cyberleninka, the Presidential Library named after B.N. Yeltsin, as well as limited access to some electronic databases.

The educational and laboratory classrooms of the Department of Automation, Information Technology and Urban Planning are equipped with modern equipment, comply with the current sanitary standards, the requirements of the anti-educational program of the fire-free educational program, the qualification requirements for the activities of educational organizations. These classrooms are used both for conducting classes in the disciplines of the EDUCATIONAL PROGRAM "6B06106 - SMART systems and programming", and for independent work of students, completing term papers and theses/projects. THE EDUCATIONAL PROGRAM "6B06106 - SMART systems and programming" is sufficiently provided with basic methodological materials on the disciplines taught.

The classrooms of the Department of Automation, Information Technology and Urban Planning are connected to a WI-FI network for online conferences, lectures, seminars with the participation of leading scientists of Kazakhstan, near and far abroad.

The Portal of educational resources of the Shakarim Semey University operates (http://ais.semgu.kz /), which contains lectures, videos, hyperlinks, tasks for self-examination, presentations on topics, textbooks and other educational and methodological content on the studied disciplines of the EDUCATIONAL PROGRAM, the content of which the teaching staff uses in the classroom, and to which students have round-the-clock access. The most common innovative methods developed by teaching staff of departments for lecturing, conducting practical and laboratory classes, protection and pre-defense of graduation papers include: video lectures, slide presentations, working with an interactive whiteboard, using various programs and applications.

The Department of Automation, Information Technology and Urban Planning has modern computer classes and classrooms equipped with interactive whiteboards with multimedia projectors.

To implement the above-mentioned purpose of the educational program, the department has the appropriate material and technical resources. 14 classrooms are involved: 2 lecture halls, equipped with LSD projectors and interactive whiteboards, 6 computer classes with a LAN connection and unlimited Internet, 5 specialized laboratories. Thus, to date, the classroom fund of the department is sufficient for the successful implementation of the educational PROGRAM plan.

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 (Caspian University, Kozybayev SKU, Gumilev ENU, VKTU named after Serikbayeva, Innovative Eurasian University in Pavlodar, Toraighyrov University, Astana IT University also as a result of working on the project, it was possible to conclude memoranda and cooperation agreements with leading EU universities.

In 2016, a cooperation agreement was signed between the Technical and Humanitarian Academy in Bielsko-Biala (Poland). In 2017, an agreement was signed with Sofia Technical University (Bulgaria). In 2018, a cooperation agreement was signed between Taras Shevchenko National University of Kyiv (Ukraine).

According to the system of double-degree education, a joint educational program is currently working with Kyungdong University, Jiongsang National University, South Korea.

During the development of the EDUCATIONAL PROGRAM, employers took part in its discussion: V.A. Zenkovich, head of the technical department of the Institution "Kazakh Center for Network Information; A.S. Bekenov, head of the IP "Title Agency", who represented the interests of specialists in the IT field.

According to the EDUCATIONAL PROGRAM, contracts for practical training were signed with LLP "Lombard "Alka", IP Nurkenova, LLP Kazpoligraf, LLP Kondiz, LLP Teplokommunenergo, JSC "Semey Engineering", LLP "IMAS GROUP", KGP at the Center for Nuclear Medicine and Oncology Semey.

2.4 Information about teaching staff implementing the educational program

The teaching staff of the Department of Automation, Information Technology and Urban Planning, which provides the implementation of the educational program "6B06106 - SMART systems and programming" is:

№	Indicators	Units of measurement	2023-2024 academic year	2024-2025 academic year	2025-2026 academic year
1	**The share of teaching staff with a degree in the educational program**	%	36	37	38

2	Including the share of teaching staff with a degree in the OOD cycle	%	37	39	40

The Department of Automation, Information Technology and Urban Planning carries out the educational process at three levels of study: bachelor's degree, Master's degree and PhD doctorate. The formation of scientific and pedagogical personnel at the department is carried out by training through a master's degree, PhD doctoral studies, advanced training of the teaching staff.

Teachers of the educational program undergo advanced training in leading universities of Kazakhstan (according to the FPC plan) and training seminars held by the Ministry of Education and Science of the Republic of Kazakhstan, universities and other organizations. Teachers' training is confirmed by certificates and certificates. Teaching staff of the University undergo scientific internships in universities of far and near abroad, in universities and research institutes of the Republic of Kazakhstan. The qualified staff of teachers is able to provide a high-quality educational process, meets the qualification requirements, the level and specifics of the educational program.

A number of teachers, such as Bekkasimova D.T., Zolotov A.D., Kozhakhmetova D.O. have a practical educational program to work at enterprises: Bekkasimova D.T. – Deputy director for ICT, KSU "Center for Scientific and Practical Education and Tourism" of the Department of Education of the Semey city of the Department of Education of the Abai region, associate Professor Zolotov A.D. - automation engineer of the Fedorovsky Gormolzavod of the Kostanay region, Kozhakhmetova D.O. in the Instrumentation of the Milling and Feed Mill, Madiev T.B. works as a programmer of the Center for Information and Communication technology at Shakarim University.

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. Senior teachers Bekbaeva R.S., Ospanov E.A., Myasoedov D.V., Kurushbaeva D.T. were awarded diplomas and letters of thanks from the akim of Semey.

The teaching staff of the educational program "6B06106 - SMART systems and programming" participates in competitions for grant funding, program-targeted financing of projects, which are administered by the Ministry of Education and Science of the Republic of Kazakhstan, development institutes. The scientific direction of the department is connected with research in the field of solving scientific and practical problems in various areas of automation and IT. The teaching staff of the department has a high scientific and methodological publication activity.Результаты научной деятельности преподавателей отражаются в научных изданиях с импакт-фактором. Ученые кафедры «Автоматики, информационных технологии и градостроительства» имеют индекс Хирша (h-index) в базах WebofScience и Scopus.

2.5 Characteristics of educational program achievements

The achievements of the educational program include the training of target specialists, scientific and pedagogical personnel. 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 academic mobility development, students undergo scientific internships in foreign research centers: University of Ecology and Management in Warsaw between Shakarim State University of Semey, Transilvania University of Brasov Romania between Shakarim State University of Semey, Jan Amos Komenski State School of Higher Education in Leszno Poland between Shakarim State University of Semey, Pamukkale University between Shakarim State University of Semey, Technological educational Institute (TEI) of Crete between Shakarim State University of Semey , Democritus University of Thrace between Shakarim State University of Semey. The university implements international projects in the field of education and science, such as: Development of 2-cycle Innovative curriculum in Microelectronic Engineering, where teachers of the educational program take part.

3. The main objectives of the educational program development plan

In accordance with the Strategic Development Plan of the University for the effective implementation of the educational program "6B06106 - SMART systems and programming" of the educational program, the following tasks are assigned:
• Providing high-quality training of competitive specialists
• Development and implementation of scientific projects
• Development of human resources
• Strengthening the material and technical base
• Development of international cooperation

The expected final results assume: participation in funded grant projects, the publication activity of teaching staff in rating publications with a non-zero impact factor, the development and operation of joint educational programs with foreign universities, the introduction of research results into the educational process, the involvement of students in research, academic mobility of students and teaching staff.

4. Risk analysis of the educational program

      Identification and risk assessment of the educational program "6B06106 - SMART systems and programming" is carried out in accordance with the Strategic Development Plan of the University until 2026. The mechanism for monitoring possible risks of the educational program "6B06106 - SMART systems and programming" is the educational program surveys and questionnaires of students with satisfaction with the organization of the educational process, the quality of teaching, material and technical base. in order to assess the quality of the implemented educational program, meetings are held with specialists, graduates of previous years, students. questionnaires of employers who evaluate the quality of training of specialists are systematically monitored. The results of the survey and monitoring of the risks of the educational program are analyzed and used in the future when updating educational programs.

      The successful implementation of the educational program can be influenced by various types of risks and as a result, preventive measures of the educational program have been developed measures to reduce them:

№	Name of risks	Measures to eliminate
1	Decrease in the number of students enrolled in the educational program	Development of a comprehensive career guidance plan for undergraduate students of the University. Attracting a contingent of students on a fee-and-contract basis
2	Insufficient level of knowledge of the language for the introduction of multilingualism	Strengthening the language training of students and teaching staff by mandatory attendance of foreign language courses created both at the university and outside it
3	Decrease in the level of employment	Attracting employers, Alumni Fair
4	Insufficient development of external and internal academic mobility of students and teaching staff	To intensify work with foreign universities for the exchange of students and teaching staff on academic mobility
5	The risk of reducing the settling of the teaching staff according to the educational program	Increasing the degree of settling down by defending doctoral dissertations
6	The improving digital material and technical base can lead to a rapid aging of the existing base	Timely planned purchase of modern equipment and software

5. Action plan for the development of the educational program

№	Criteria	Expected results	unit of measurement	2023-2024	2024-2025	2025-2026
Направление 1. Учебно-методическое обеспечение						
1.1	Updating the educational program based on professional standards, taking into account the recommendations of employers	Conducting an examination of the Educational program "6B06106 - SMART systems and programming" in order to improve the practice orientation and development of professional competencies of graduates	fact	-	-	+
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 key and professional competencies of graduates in accordance with the demands of the labor market.	fact	-	-	+
1.3	Introduction of modern learning technologies into the educational process, contributing to the development of cognitive activity, communicative ability of students	Improving the quality of teaching academic disciplines, taking into account the novelty and variety of forms of work that contribute to the development of cognitive activity.	fact	-	+	+
1.3.1	Implementation of mass open online courses (MOOCs) in the educational process according to the educational program 6B06106 - SMART systems and programming	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.	unit	-	-	1

1.4	Involvement of social partners and employers in the development, examination of the implementation of educational programs	Improving the quality of implemented educational programs taking into account market demands and recommendations of employers	unit	**1**	**1**	**1**
1.5	Development and implementation of elective courses in English	Introduction of disciplines in English into the educational process	unit	-	**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	unit	-	-	**1**
1.7	Publication of educational, methodical and scientific literature on the implemented educational programs	Improvement of educational and methodological support in the disciplines of the implemented educational programs	unit	**1**	**1**	**1**
1.8	Conclusion of contracts with foreign and domestic partner universities in order to develop academic exchange of students of all levels and teaching staff	Creation of a database of foreign and domestic partner universities for the development of academic exchange of students of all levels and teaching staff	unit	-	**1**	-
1.9	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	people	-	**1**	**1**
1.10	Participation of teaching staff and students in international academic exchange programs	Development of international cooperation with foreign universities implementing educational programs in the direction of the EDUCATIONAL PROGRAM "6B06106 - SMART systems and programming"	people	-	**1**	**1**

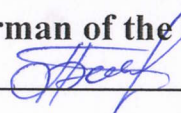|						
1.11	Development of outgoing academic mobility of teaching staff and students in the direction of the EDUCATIONAL PROGRAM "6B06106 - SMART systems and programming"	Совершенствование образовательной программы на основе использования образовательной программыыта реализации подобных программ в ведущих зарубежных ВУЗах	people	-	1	-
Direction 2. Teaching staff						
2.1	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 and international level is at least 20%	people	1	1	1
2.2	Advanced training, retraining, internships of teaching staff at the international level	Completion of at least 2 teachers of the advanced training program, retraining, internships of teaching staff at the international level	people	-	1	1
2.3	Promotion of publications of the works of teaching staff in international publications indexed by the Web of Science and Scopus databases	An increase in the share of teaching staff, educational programsublished the results of scientific research in publications indexed by the Web of Science and Scopus databases – at least 30% of the total number of teaching staff	%	30	30	30
2.4	Involvement of practical specialists in teaching and scientific activities	Participation in the implementation of educational programs of practitioners (at least 20% of specialists)	%	10	20	20
Direction 3. Internationalization of educational programs						
3.1	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	unit	-	1	1

3.2	Attracting foreign students to study under the educational program "6B06106 - SMART systems and programming"	Increasing the number of foreign students	people	**1**	**1**	**1**
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	unit	**-**	**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	unit	**-**	**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	people	**-**	**-**	**1**
Direction 4. Logistics and digitalization						
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)	unit	**-**	**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, teaching staff workload, schedule, library, syllabuses)	fact	**+**	**+**	**+**

4.3	Replenishment of the full-text database of research results 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.)	unit	2	2	3
4.4	Expansion of the fund of scientific and educational literature, including on electronic media for implemented educational programs	Ensuring the implementation of educational programs based on modern educational and information resources, including on electronic media	%	10	10	10
4.5	Monitoring the content and improvement of the faculty's website	Formation of the faculty's website on various aspects of the implementation of educational programs	%	20	20	20

Head of the Department _____Kozhakhmetova D.

REVIEWED
at the meeting of the Quality Assurance Commission of the
Faculty of Engineering and Technology Minutes of the meeting
No. 5 dated 05/25/2023

Chairman of the Quality Assurance Committee
_____ Abdilova G.

AGREED

Dean of the Faculty _____ **Nurimkhan G.**

«25» 05.2023.