NJSC SHAKARIM UNIVERSITY OF SEMEY

EDUCATIONAL PROGRAM

6B06 - Information and Communication Technologies
(Code and classifcation of the feld of education)

6B061 - Information and communication technologies
(Code and classifcation of the direction of training)

0610
(Code in the International Standard Classifcation of Education)

B057 - Information technology
(Code and classifcation of the educational program group)

6B06105 - Computer Engineering and Software/Smart Computing
(Code and name of the educational program)

Bachelor
(Level of preparation)

Semey

Educational program

6B06 -- Information and Communication technologies
(Code and classification of the field of education)

6B061 - Information and Communication technologies
(Code and classification of the direction of training)

0610
(Code in the International Standard Classification of Education)

B057 - Information technology
(Code and classification of the educational program group)

6B06105 - Computer Engineering and Software/Smart Computing
(Code and name of the educational program)

bachelor
(Level of preparation)

Semey 2024

PREFACE

Developed

The educational program 6B06105 - Computer Engineering and Software/ Smart Computing in the direction of preparation 6B061 - Information and Communication technologies on the basis of the State Compulsory Standards of Higher and Postgraduate Education approved by the Order of the Ministry of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 No 2 (as amended by the order) was developed by the Academic Committee dated 20.02.2023 No 66).

Members of the Academic Committee	Full name	Academic degree, academic title, position
Head of the Academic Committee	Kozhakhmetova Dinara Oshanovna	Dean of the Higher School of Artificial Intelligence and Construction
Educational program manager	Kurushbayeva Dinara Talgatovna	Senior lecturer of the Department of IT technologies, master of technical sciences
Member of the AC	Bekbaeva Roza Serikzhanovna	Head of the Department of "IT Technologies", Candidate of Technical Sciences
Member of the AC	Karymsakova Indira Bekenovna	Acting associate professor of the IT department, PhD
Member of the AC	Daurembekova Umut Ergazievna	Head of ICU, Semey Engineering JSC
Member of the AC	Uali Aitore Serikkalievich	HR Manager of iMAS GROUP LLP
Member of the AC	Omyrkanov Talgat Kairatovich	Student of the BSC 301 group
Member of the AC	Omyrkanov Talgat Kairatovich	Student of the BSC 301 group

Reviewing

Full name of the reviewer	Position, place of work
Bekkasimova Danar Talgatovna	Deputy Director of the KSU "Center for Scientific and Practical Education and Tourism" of the Semey City Education Department of the Abai region Education Department."
Kaybasova Dinara Zhenisbekovna	Acting Associate Professor of the Department of Computer Engineering at Astana IT University

Reviewed

at the meeting of the Commission on Academic Quality of the Faculty of Engineering and Technology
Protocol No. 3 of January 15, 2024
at the meeting of the Commission on Academic Quality of the Higher School of Artificial Intelligence and Construction
Recommended for approval by the Academic Council of the University
Protocol No. 1, "6" June 2024

Approved

at a meeting of the University Academic Council by protocol No. 6/1 of January 19, 2024.

at a meeting of the University Academic Council by protocol No. 11 of June 28, 2024.

Content

1.Introduction

1.1.General data

The educational program 6B06105 "Computer Engineering and Software / Smart Computing", implemented by theGraduate School
Artificial Intelligence and Construction of the Shakarim State University of Semey city in terms of bachelors degree, was developed taking into account the needs of the regional and national labor market, the requirements of regulatory documents of the Ministry of Education and Science of the Republic of Kazakhstan and represents is a system of documents for organizing the educational process.
Educational program 6B06105 "Computer Engineering and Software / Smart Computing" prepares students to become professionals in the field of information technology, allowing them to apply theoretical and practical knowledge in the real world. Provides students with IT knowledge to make them suitable for starting their careers in the IT industry as software developers, IT infrastructure specialist, database administrator, cybersecurity experts, big data analysts, web designers and etc.
A graduate, having mastered such qualities, has the opportunity to create new and innovative ideas in the field of IT at enterprises of the Republic of Kazakhstan and abroad.

When implementing the educational program, it is planned to use artificial intelligence tools in the educational process, thereby developing digital competencies among students in a rapidly changing technological environment.

The educational program provides for the education of a student with special educational needs in the conditions of a higher educational institution, as well as his socialization and integration into society.

1.2.Completion criteria

The main criterion for the completion of the educational process for the preparation of bachelors is the development by students of at least 205 credits of theoretical training, as well as at least 27 credits of practice, 8 credits of final certification.
Total 240 credits.

1.3.Typical study duration: 4 years.

2.PASSPORT OF THE EDUCATIONAL PROGRAM

2.1.EP purpose	To educate and to prepare students to become IT professionals by enabling them to apply theoretical and practical knowledge in the real world. To provide students with IT knowledge to make them fit to start their careers in the IT industry as software developers, IT infrastructure specialist, database administrator, cybersecurity experts, big data analytics, web designers and etc. A graduate, having mastered such qualities, has the opportunity to create new and innovative ideas in the field of IT at enterprises of the Republic of Kazakhstan and abroad.
2.2.Map of the training profile within the educational program	
Code and classification of the field of education	6B06 - Information and Communication technologies
Code and classification of the direction of training	6B061 - Information and Communication technologies
Code in the International Standard Classification of Education	0610
Code and classification of the educational program group	B057 - Information technology
Code and name of the educational program	6B06105 - Computer Engineering and Software/Smart Computing
2.3.Distinctive features of the OP (double degree/joint, OVPO-partner, Double major, innovative)	Double diploma
2.4.Qualification characteristics of the graduate	
Degree awarded / qualification	Bachelor in Information and Communication Technologies in the educational program 6B06105 “Computer Engineering and Software / Smart Computing”
Name of professional standard	Managing the architecture of computer systems; Software development; Information security; Database administration.
Atlas of new professions	-
Regional standard	-
Name of the profession / list of positions of a specialist	Software developer, IT infrastructure specialist, database administrator, cybersecurity expert, big data analyst, web designer, etc.
OQF qualification level (industry qualification framework)	6
Area of professional activity	The area of professional activity of a specialist: ▯ Information and communication ▯ IT industries
Object of professional activity	The objects of professional activity of graduates are enterprises and organizations of various forms of ownership that develop, implement and operate information systems in various fields of human activity. Objects of professional activity under the Educational program: - computers, complexes, systems and networks; - computer systems for information processing and

	management; - computer-aided design systems; - software for computer facilities and information systems.
Types of professional activity	Graduates of the educational program “Computer Engineering and Software / Smart Computing” can carry out the following professional activities: design and engineering; production and technological; experimental research; organizational and managerial; operational.
2.5.Graduate Model	Graduate of OP 6B06105 - Computer Engineering and Software/ Smart Computing has the following competencies: - Competencies in the field of professional communication in a multilingual environment. - A stable worldview and a clear a civic position based on interdisciplinary connections. - The ability to solve standard tasks of professional activity using Information and communication technologies, use the basic laws natural sciences and general technical disciplines in professional activity. - Know programming languages such as C and C ++, for working in the development of various programs and video games. - The ability to identify intrusion detection using cybersecurity standards. - Has the ability to plan and implement network infrastructure.

3.Modules and content of the educational program

Module 1. Fundamentals of social and humanitarian knowledge

Brief description of the module content

Module disciplines

Foreign language

Kazakh(Russian) language (1)

Bases of economics, law and ecological knowledge

Physical Culture

Foreign language

History of Kazakhstan

Kazakh(Russian) language (2)

The module of socio-political knowledge (sociology, political science, cultural studies, psychology)

Physical Culture

Physical Culture

World of Abai

Information and communication technology

Physical Culture

Philosophy

Module 2. Intercultural communication

Brief description of the module content

The study of the disciplines of this module is aimed at the formation of students` linguistic and intercultural competence. It examines the problems of intercultural communication in modern conditions.

Module disciplines

Korean I

Multicultural Studies

Statistics

Korean II

Korean III

Korean IV

Module 3. Games Development

Brief description of the module content

The module is dedicated to the basics of game development technologies. The issues of applying mathematics in game development are being studied. Basic knowledge and materials are provided for further study and development of personal competencies in the gaming industry and other technical areas.

Module disciplines

System Analysis & Design

Educational practice

Internship I

2D Computer Animation

Computer Graphics

Fundamentals of game design

Computer Games Programming & Game Engine

Game development for mobile platforms

Virtual Reality

3D Modelling

Module 4. Big Data & Cloud Computing

Brief description of the module content

The module provides students with the necessary amount of theoretical and practical knowledge about cloud information processing and storage technology, skills and abilities for the practical implementation of cloud technologies in modern business, and the study of the tools of this technology.

Module disciplines

Discrete Mathematics with Applications

Information Systems

Fundamentals of algorithmization

Programming Language I

Software Architecture

Software Design

Programming Technologies

Programming Language II

Operations Research

Operating system concepts and network management

Operating Systems

System software

RDBMS concepts and Oracle

Distributed and centralized database

Database Management Systems

Parallel and Distributed Computing

Introduction to Data Warehousing Fundamentals

Data Mining Concepts and Techniques

Data Science

Introduction to Cloud Architecture

Cloud Storage Infrastructure

Cloud Computing and Virtualization

Module 5. Cyber Security & Privacy

Brief description of the module content

The module forms the student`s basic principles of information security of the state, approaches to the analysis of its information infrastructure, design and analysis of information security systems, as well as introduces the student to artificial intelligence systems, its main functions and principles.

Module disciplines

Introduction to Information Technology

Computer & Information Security

Fundamentals of information security

Introduction to cyber criminology

Cryptography and Cyber Security

Network security and cryptography

Artificial Neural Networks

Artificial Intelligence

Artificial intelligence and expert systems

Fraud and countermeasures in IT and telecommunications

Basics of Cyber Forensic

Digital Forensics and Investigations

Decision Support Systems

Ethical Hacking

Module 6. Ubiquitous internet of things

Brief description of the module content

The module introduces students to digital technologies and algorithms within the framework of the Internet of Things concept. Students will learn how to select technologies for working with information depending on the class of tasks in this area, gain skills in programming technologies and configuring the network interaction of the Internet of Things.

Module disciplines

IT project management

Computer communication and networking

Network Infrastructure and Management

Network Administration and Design

Wireless Networks and Ubiquitous Computing

Microwave communication

Mobile communication system

Linux Operating Systems & Networking

Internship II

IoT cloud infrastructure

Internet of Things

Performance and security in IoT

Module 7. Mobile & web development

Brief description of the module content

The module has 2 directions. The first direction is designed to familiarize students with the methods and tools of development for the Android platform. The second direction is the creation of Web-oriented applications. The module is focused on gaining knowledge about the development process and tools, as well as gaining practical skills. At the end of the course, students will be ready to start developing both web applications and Android applications.

Module disciplines

Computer Architecture and Digital Systems

Computer Organization and Assembly language

Object-Oriented Programming with Java

Digital logic fundamentals

Programming of mobile systems

Web Applications Development

User Experience Design

Internet Application and Multimedia

Mobile Computing

Advanced Web Technolology

Pre-diploma practice

Internship III

Android Application Development

Final examination

Brief description of the module content

Writing and defending a thesis or preparing and passing a comprehensive exam.

Module disciplines

Comprehensive exam

Diploma project

4.Summary table on the scope of the educational program

«6B06105 - Computer Engineering and Software/Smart Computing»

Name of discipline	Cycle/ Component	Term	Number of credits	Total hours	Lec	SPL	LC	IWST	IWS	Knowledge control form
Module 1. Fundamentals of social and humanitarian knowledge										
Foreign language	GER/CC	1	5	150		45		35	70	Examination
Kazakh(Russian) language (1)	GER/CC	1	5	150		45		35	70	Examination
Bases of economics, law and ecological knowledge	GER/US	1	5	150	15	30		35	70	Examination
Physical Culture	GER/CC	1	2	60		60				Differentiated attestation
Foreign language	GER/CC	2	5	150		45		35	70	Examination
History of Kazakhstan	GER/CC	2	5	150	30	15		35	70	Qualification examination
Kazakh(Russian) language (2)	GER/CC	2	5	150		45		35	70	Examination
The module of socio-political knowledge (sociology, political science, cultural studies, psychology)	GER/CC	2	8	240	30	45		55	110	Examination
Physical Culture	GER/CC	2	2	60		60				Differentiated attestation
Physical Culture	GER/CC	3	2	60		60				Differentiated attestation
World of Abai	BS/US	3	3	90	15	15		20	40	Examination
Information and communication technology	GER/CC	4	5	150	15	15	15	35	70	Examination
Physical Culture	GER/CC	4	2	60		60				Differentiated attestation
Philosophy	GER/CC	4	5	150	30	15		35	70	Examination
Module 2. Intercultural communication										
Korean I	BS/US	1	6	180		60		40	80	Examination
Multicultural Studies	BS/US	1	5	150	30	15		35	70	Examination
Statistics	BS/US	1	5	150	30	15		35	70	Examination
Korean II	BS/US	2	6	180		60		40	80	Examination
Korean III	BS/US	3	6	180		60		40	80	Examination
Korean IV	BS/US	4	6	180		60		40	80	Examination
Module 3. Games Development										
System Analysis & Design	BS/US	2	5	150	15	30		35	70	Examination
Educational practice	BS/US	2	2	60						Total mark on practice
Internship I	BS/US	4	5	150						Total mark on practice
2D Computer Animation	BS/US	5	5	150	15	30		35	70	Examination

Computer Graphics	BS/US	5	5	150	15	30		35	70	Examination
Fundamentals of game design	BS/CCh	6	5	150	15	30		35	70	Examination
Computer Games Programming & Game Engine	BS/CCh	6	5	150	15	30		35	70	Examination
Game development for mobile platforms	BS/CCh	6	5	150	15	30		35	70	Examination
Virtual Reality	BS/US	7	5	150	15	30		35	70	Examination
3D Modelling	BS/US	8	5	150	15	30		35	70	Examination
Module 4. Big Data & Cloud Computing										
Discrete Mathematics with Applications	BS/US	1	5	150	15	30		35	70	Examination
Information Systems	BS/US	1	5	150	30	15		35	70	Examination
Fundamentals of algorithmization	BS/US	1	5	150	30	15		35	70	Examination
Programming Language I	BS/US	1	5	150	15	30		35	70	Examination
Software Architecture	BS/CCh	2	5	150	15	30		35	70	Examination
Software Design	BS/CCh	2	5	150	15	30		35	70	Examination
Programming Technologies	BS/CCh	2	5	150	15	30		35	70	Examination
Programming Language II	BS/US	2	5	150	15	30		35	70	Examination
Operations Research	BS/US	3	5	150	15	30		35	70	Examination
Operating system concepts and network management	BS/CCh	3	5	150	15	30		35	70	Examination
Operating Systems	BS/CCh	3	5	150	15	30		35	70	Examination
System software	BS/CCh	3	5	150	15	30		35	70	Examination
RDBMS concepts and Oracle	BS/CCh	4	5	150	15	30		35	70	Examination
Distributed and centralized database	BS/CCh	4	5	150	15	30		35	70	Examination
Database Management Systems	BS/CCh	4	5	150	15	30		35	70	Examination
Parallel and Distributed Computing	AS/US	5	5	150	15	30		35	70	Examination
Introduction to Data Warehousing Fundamentals	AS/CCh	7	5	150	15	30		35	70	Examination
Data Mining Concepts and Techniques	AS/CCh	7	5	150	15	30		35	70	Examination
Data Science	AS/CCh	7	5	150	15	30		35	70	Examination
Introduction to Cloud Architecture	BS/CCh	8	5	150	15	30		35	70	Examination
Cloud Storage Infrastructure	BS/CCh	8	5	150	15	30		35	70	Examination
Cloud Computing and Virtualization	BS/CCh	8	5	150	15	30		35	70	Examination
Module 5. Cyber Security & Privacy										
Introduction to Information Technology	AS/CCh	3	5	150	15	30		35	70	Examination
Computer & Information Security	AS/CCh	3	5	150	15	30		35	70	Examination
Fundamentals of information security	AS/CCh	3	5	150	15	30		35	70	Examination
Introduction to cyber criminology	AS/CCh	4	5	150	15	30		35	70	Examination

Cryptography and Cyber Security	AS/CCh	4	5	150	15	30		35	70	Examination
Network security and cryptography	AS/CCh	4	5	150	15	30		35	70	Examination
Artificial Neural Networks	AS/CCh	5	5	150	15	30		35	70	Examination
Artificial Intelligence	AS/CCh	5	5	150	15	30		35	70	Examination
Artificial intelligence and expert systems	AS/CCh	5	5	150	15	30		35	70	Examination
Fraud and countermeasures in IT and telecommunications	BS/CCh	6	5	150	15	30		35	70	Examination
Basics of Cyber Forensic	BS/CCh	6	5	150	15	30		35	70	Examination
Digital Forensics and Investigations	BS/CCh	6	5	150	15	30		35	70	Examination
Decision Support Systems	AS/US	6	5	150	30	15		35	70	Examination
Ethical Hacking	AS/US	7	5	150	15	30		35	70	Examination
Module 6. Ubiquitous internet of things										
IT project management	BS/US	3	5	150	30	15		35	70	Examination
Computer communication and networking	BS/CCh	4	5	150	15	30		35	70	Examination
Network Infrastructure and Management	BS/CCh	4	5	150	15	30		35	70	Examination
Network Administration and Design	BS/CCh	4	5	150	15	30		35	70	Examination
Wireless Networks and Ubiquitous Computing	BS/CCh	5	5	150	15	30		35	70	Examination
Microwave communication	BS/CCh	5	5	150	15	30		35	70	Examination
Mobile communication system	BS/CCh	5	5	150	15	30		35	70	Examination
Linux Operating Systems & Networking	BS/US	6	5	150	15	30		35	70	Examination
Internship II	BS/US	6	5	150						Total mark on practice
IoT cloud infrastructure	AS/CCh	8	5	150	15	30		35	70	Examination
Internet of Things	AS/CCh	8	5	150	15	30		35	70	Examination
Performance and security in IoT	AS/CCh	8	5	150	15	30		35	70	Examination
Module 7. Mobile & web development										
Computer Architecture and Digital Systems	BS/CCh	3	5	150	15	30		35	70	Examination
Computer Organization and Assembly language	BS/CCh	3	5	150	15	30		35	70	Examination
Object-Oriented Programming with Java	BS/US	3	5	150	15	30		35	70	Examination
Digital logic fundamentals	BS/CCh	3	5	150	15	30		35	70	Examination
Programming of mobile systems	BS/US	4	5	150	15	15	15	35	70	Examination
Web Applications Development	AS/US	5	5	150	15	30		35	70	Examination
User Experience Design	BS/US	6	5	150	15	30		35	70	Examination
Internet Application and Multimedia	AS/CCh	7	5	150	15	30		35	70	Examination
Mobile Computing	AS/CCh	7	5	150	15	30		35	70	Examination
Advanced Web Technolology	AS/CCh	7	5	150	15	30		35	70	Examination

Pre-diploma practice	AS/CCh	8	15	450						Total mark on practice
Internship III	AS/CCh	8	15	450						Total mark on practice
Android Application Development	AS/US	8	5	150	15	30		35	70	Examination
Final examination										
Comprehensive exam		6	8	240						
Diploma project		6	8	240						

NON -PROFIT LIMITED COMPANY «SHAKARIM UNIVERSITY OF SEMEY»

EDUCATIONAL PROGRAM DEVELOPMENT PLAN

6B06105 - «Computer technology and software / Smart Computing»

2024-2028 years

Semey 2024

Content

1. Passport of the Bachelor's Degree Development Plan 6B06105 Computer Engineering and software/ Smart Computing

1	The basis for the development	Development program of the Non -Profit Limited Company «Shakarim University of Semey» for 2023-2029 In the modern world, it is impossible to imagine life without information technology. Information technologies represent the entire accumulated experience of mankind in a formatted form suitable for applied use. New information technologies based on computer technology require radical changes in the organizational structures of management, its regulations, human resources, documentation systems, recording and transmission of information. More and more qualified specialists are required in the field of Information technology.
3	Terms of implementation	2024-2028y.
4	Expected results of the implementation	Preparation of bachelors with general cultural and professional competencies in the IT industry, cybersecurity and big data, etc., which constitute a training area that meets the requirements of employers.

2. Analytical justification of the EP

2.1 Information about the educational program

The educational program 6B06105 “Computer Engineering and Software/ Smart Computing”, implemented by the Higher School of Artificial Intelligence and Construction of the NPJC "Shakarim University of Semey" at the bachelor's degree level, was developed taking into account the needs of the regional and national labor market, the requirements of regulatory documents of the Ministry of Education and Science of the Republic of Kazakhstan and is a system of documents for the organization the educational process.

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 EP 6B06105 "Computer Engineering and Software/ Smart Computing".

The educational program 6B06105 "Computer engineering and software / Smart Computing" in the field of training "6B057 Information Technology", implemented by the NPJC "Shakarim Semey University", was developed taking into account the needs of the regional labor market.

The content of the educational program is implemented through a curriculum developed in a modular format, which provides two cycles of disciplines: a cycle of basic disciplines and a cycle of core disciplines, as well as additional types of training.

2.2 Information about students

Academic year / The basis of learning	2024-2025 Academic year	2025-2026 Academic year	2026-2027 Academic year	2027-2028 Academic year
Grant	8	10	10	12
Contract	15	20	25	25
Total	23	30	35	37

2.3 Internal and external conditions for the development of EP

To implement the educational program 6B06105 "Computer engineering and software / Smart Computing", the department has the appropriate material and technical equipment. The department has the software and hardware necessary for mastering the disciplines of the educational program.

To date, the classroom fund of the department is sufficient for the successful implementation of the OP plan. The department is equipped with 5 computer classes with LAN connection and unlimited Internet, 4 specialized laboratories, 14 classrooms. Information resources are provided 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 on the university grounds.

According to the educational program 6B06105 "Computer engineering and software / Smart Computing", work is successfully underway on the program of internal and external academic mobility. Students of this educational program for the first 2 years (1st and 2nd year) study at the NPJC "Shakarim University", and the 3rd and 4th year study at Kyung Dong University, South Korea.

During the development of the EP, employers took part in its discussion: Daurembekova U.E. - Head of the Information Technology, Communications and Information Security Department of Semey Engineering JSC, Kdirbaev A.N. - Director of Kigros LLP, who represented the interests of production specialists.

2.4 Information about teaching staff implementing the educational program

The total number of the faculty of the department as of September 1, 2024 was 15 people, including 5 people with academic degrees and titles. All teachers have extensive teaching experience, academic titles and degrees, as well as work experience in production.

The teaching staff of the department is constantly improving knowledge in this field and undergoing advanced training, including short-term refresher courses, visits to various seminars, internships at leading universities in Kazakhstan, far and near abroad, as well as in relevant industry organizations.

2.5 Characteristics of the achievements of the EP

The main indicator of the effectiveness of the educational program is the proportion of employed graduates. The dynamics of the share of employed in recent years has been, respectively, by year: 2021 -100%, 2022-100%, 2023 – 100%.

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.

Attracting professors from leading foreign universities to teaching and research activities. In order to improve the level of education, it is planned to invite foreign scientists to give lectures to students of this EP in 2024-2028.

3. The main objectives of the EP development plan

The purpose of the educational institution and its development is to improve it in accordance with the mission and strategy of the university, aimed at training highly qualified, competitive personnel, improving the quality of knowledge, forming a multi-level system of research activities in accordance with the urgent needs of modern education and science, transformation into an innovative world-class university.

The main purpose of EP 6B06105 "Computing and Software/ Smart Computing" is to train professionals in the field of information technology, providing students with knowledge in the field of information technology in order to prepare them to start their careers in the IT industry as software developers, IT infrastructure specialist, database administrator, experts in cybersecurity, big data analytics, web designers, etc. Having mastered such qualities, a graduate has the opportunity to create new and innovative ideas in the field of IT at enterprises of the Republic of Kazakhstan and abroad.

The following tasks are defined for the implementation of the educational program 6B06105 "Computer engineering and software/ Smart Computing":

- •to ensure the level of education of students that meets the modern requirements of the specifics of the educational institution
- to develop independent thinking, the ability to self-development and self-education among students and teaching staff;
- provide conditions that take into account the individual and personal characteristics of the student;

- to create a positive environment among students for fruitful learning activities.
- to organize the study, implementation and improvement of technologies and methods for diagnosing the quality of education;
- integrate new information technologies into the educational process.

to improve the organization of the educational process:
• to improve the interaction of academic disciplines;
• introduce technologies that form key competencies into the educational process.

4. Risk analysis of EP

№	Name of risks	Elimination measures
1	Decrease in the number of students enrolled in the EP	The formation of a contingent of students through career guidance and information and advertising work (improving the effectiveness of speaking in the media), the formation of a positive image of the educational institution
2	Insufficient knowledge of the language for the introduction of multilingualism	Taking language courses, obtaining IELTS and TOEFL certificates
3	Decrease in the level of employment	Work on dual training
4	Insufficient development of external and internal academic mobility of students and teaching staff	Conclusion of contracts with universities
5	The risk of reducing the settlement by EP	Financial support for initiative teachers; motivation and stimulation for scientific and pedagogical activities (financial encouragement for the manifestation of creative qualities); professional development of staff of teaching staff through doctoral studies
6	Insufficient provision of educational and methodological literature on professional disciplines in the state language	To plan the annual release of scientific and educational literature in the state language by scientists and teaching staff
7	Material and technical base	Implementation of annual purchases of modern equipment and

		verification of equipment; timely repair of educational laboratories
8	Weak involvement of teaching staff and students in research activities	Work in scientific circles, participation in international and national scientific conferences and competitions, in competitions for grant funding

5. Action plan for the development of the EP

№	Criteria	Expected results	Unit of measurement.	2024-2025	2025-2026	2026-2027	2027-2028
Direction 1. Educational and methodological support							
1.1	Updating the educational program based on professional standards, taking into account the recommendations of employers	Conducting an examination of the Educational program 6B06105 "Computer engineering and software/ Smart Computing" in order to increase 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, and 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	The introduction of modern learning technologies into the educational process that contribute to the development of cognitive activity and the 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 6B06105	The introduction of disciplines into the educational process, 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.	un	**-**	**1**	**1**	**1**
1.4	Involvement of social partners and employers in the development and examination of the implementation of educational programs	Improving the quality of educational programs implemented, taking into account market demands and recommendations from employers	un	**1**	**1**	**1**	**1**
1.5	Development and implementation of elective courses in English	Conducting classes in English	un	**5**	**5**	**4**	**4**
1.6	Conducting seminars and round tables on the application of innovative technologies in the educational process	The introduction of innovative technologies in the educational process	un	**1**	**1**	**1**	**1**

1.7	Publication of educational, methodical and scientific literature on the implemented EP	Improvement of educational and methodological support in the disciplines of the implemented educational programs	un	**2**	**2**	**2**	**2**
1.8	Conclusion of agreements 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	un	**1**	**1**	**1**	**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	man	**-**	**-**	**-**	**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 6B06105 "Computer engineering and software/ Smart Computing"	man	**1**	**1**	**1**	**1**
1.11	Development of outgoing academic mobility of teaching staff and students in the direction 6B06105 "Computer engineering and software/ Smart Computing"	Improving the educational program based on the experience of implementing such programs in leading foreign universities	man	**-**	**1**	**1**	**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 completed advanced training at the national and international levels is at least 25%	man	**25**		**25**	
2.2	Advanced training, retraining, internships of teaching staff at the international level	Completion of at least 1 teacher of the advanced training program, retraining, internship of teaching staff at the international level	man	**-**	**-**	**1**	**1**
2.3	Promotion of publications of the works of the Faculty in international publications indexed by the Web of Science and Scopus databases	An 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 30% of the total number of teaching staff	%	**30**		**30**	
2.4	Involvement of practical specialists in teaching and scientific activities	Participation of practitioners in the implementation of educational programs (at least 15% of specialists)	%	**15**	**15**	**15**	**15**
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	Un.	**-**	**-**	**1**	**1**

3.2	Attracting foreign students to study under the educational program 6B06105 "Computer engineering and software/ Smart Computing"	Increasing the number of foreign students	man	**-**	**-**	**1**	**1**
3.3	Organization of joint scientific and practical events with international partners	Improving the effectiveness of scientific and methodological activities of teaching staff, exchange of experience with foreign partners	Un.	**-**	**-**	**1**	**1**
3.4	Inviting foreign experts to give lectures and consultations on master's projects and dissertations	Improving the content component of educational programs based on the introduction of the experience of foreign specialists in the implementation of educational programs	Un.	**1**	**1**	**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	man	**-**	**-**	**-**	**-**
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, multifunction devices, webcam, projector screen)	Un.	**2**	**2**	**2**	**2**
4.2	Automation of the educational process (testing, session management, student body movement, dean's office, department, teaching staff workload, schedule, library, syllabuses)	Information management based on 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.)	An increase in the number of results of scientific works of scientists, research of teaching staff and students, teaching staff (articles, monographs, etc.)	Un.	**1**	**1**	**1**	**1**
4.4	Expansion of the fund of scientific and educational literature, including on electronic media for ongoing educational programs	Ensuring the implementation of educational programs based on 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's website on various aspects of the implementation of educational programs	%	**100**	**100**	**100**	**100**

Head of the Department _____ **Bekbayeva R.S.**

REVIEWED

at the meeting of the Commission on Academic Quality
Minutes of the meeting № 1 «06» 06 2024
Chairman CAQ _____ Adylkanova A.Zh.

AGREED

Dean Graduate School Artificial Intelligence and Construction _____ Kozhahmetova D.O.
«06» 06 2024