

6B06102-Information systems

The purpose of the educational program: Training of highly qualified personnel with professional and social competencies in the field of information technology, capable of designing, creating, and operating information systems

VISION, MISSION, PROGRAM GOAL, VALUES, UNIVERSITY GRADUATE ATTRIBUTES

Vision:

An intellectual platform that develops educators who are open to new ideas and able to lead in a rapidly changing world.

Mission:

Developing teacher leaders, who can create, develop, and disseminate advanced knowledge and values in education for the benefit of our country and the world.

Program goal:

Our University aims to become a hub for innovative teaching, learning, research as well as the development of rural education in Central Asia.

Values:

Integrity, commitment, care.

University graduate attributes:

- Self-guided learners and reflexive practitioners
- Responsible personalities with moral and ethical values
- Professionals with deep subject knowledge and digital skills
- Creative and critical thinkers and excellent team players and communicators
- Adaptive leaders in teaching and learning
- Diverse, inclusive and for equality of opportunity in society

THE RATIONALE BEHIND THE EDUCATION PROGRAM

In the modern world, all areas of society operate with the help of information systems. From public administration to industry, finance, education, and healthcare, processes are carried out through the collection, storage, processing, and analysis of information. Therefore, the demand for professionals in the field of information systems is growing every year.

The state program “Digital Kazakhstan”, adopted in the Republic of Kazakhstan, defines the main direction of digitalization of the country and places special emphasis on the development of information systems. This program aims to develop the digital economy, improve electronic services, and support data-driven management decisions. To achieve these goals, specialists with in-depth knowledge in the design, implementation, and maintenance of information systems are required.

Relevance of the program: The relevance of the information systems field is determined by several factors. First of all, the process of digitalization creates new opportunities and requirements in all areas of society. To increase the competitiveness of the economy, organizations are interested in automating business processes, analyzing data, and providing new digital services. In this context, the role of professionals trained in the field of information systems becomes particularly important.

In addition, the modern labor market requires specialists not only to have technical knowledge but also analytical thinking skills, project management competencies, and the ability to work in cross-functional teams. The “Information Systems” educational program fully meets these requirements and provides students with versatile competencies in programming, data analysis, information security, and system design.

Labor market demand: According to the Bureau of National Statistics of the Republic of Kazakhstan (2024), the share of employment in the field of information and communication

technologies is 5.2 percent, and the demand for specialists in this field is growing annually by an average of 8–10 percent. However, the shortage of qualified professionals who can develop, implement, and maintain information systems still remains.

According to the data from the Atlas of Emerging Jobs, professions that will be in demand over the next 5–10 years include data engineer, business analyst, information systems architect, IT project manager, and other new professional roles. These trends demonstrate the transformation of the labor market and highlight the need to adapt the content of educational programs to modern requirements.

Alignment with national development strategies: The content of the program is directly aligned with the strategic documents of the Republic of Kazakhstan. The “Kazakhstan – 2050” Strategy identifies innovative development and improvement of human capital quality as key priorities. In addition, the Concept for the Development of Higher Education for 2023–2029 requires educational programs to be adapted to the real needs of the labor market.

Graduates with a degree in information systems will contribute to digital transformation, the implementation of new technologies, and the development of the national economy.

Advantages of the program for students:

1. Mastery of programming languages and modern technologies;
2. Acquisition of experience in designing, developing, and implementing information systems;
3. Development of skills in data analysis, visualization, and their application for management decision-making;
4. Participation in business process automation and development of digital applications;
5. Acquisition of professional competencies that ensure high demand in the labor market.

The “Information Systems” educational program is distinguished by its relevance and responsiveness to the real needs of the labor market. It is fully consistent with national development strategies and is aimed at training specialists who play an important role in the digitalization of society. Program graduates will contribute to the innovative development of the national economy and ensure professional competitiveness.

DISTINCTIVE FEATURES OF THE EDUCATIONAL PROGRAM

Additional education (Minor)	Artificial Intelligence and Neural Networks — aims to develop students’ competencies in the design, development, and application of intelligent systems. Mastering modern methods and tools of artificial intelligence and neural networks will enable students to effectively solve problems related to big data processing, complex process modeling, and automated decision-making. The program contributes to the training of competitive specialists who are prepared for successful professional activity in the context of digital technologies.
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GRADUATE CAREER OPPORTUNITIES

Graduates of the educational program “6B06102 – Information Systems” are prepared to perform a wide range of professional activities in the field of information technology. Possessing knowledge and skills that meet the requirements of the modern digital economy, graduates are able to work in the public and private sectors, research centers, industrial enterprises, as well as financial and educational organizations.

The main areas of professional activity for graduates include: programmer; web programmer; database organizer and administrator of information systems; systems analyst; computer network administrator;

specialist in information security and data protection; consultant and expert in applied information technologies; project manager in digital transformation and implementation of information systems.

Specialists in this field can actively participate in the development, adaptation, support, and integration of information systems, as well as in the automation and digitalization of organizational processes.

AREAS OF PROFESSIONAL COMPETENCE

The Bachelor of 6B06 Information and Communication Technologies on the educational program 6B06102 – Information Systems can perform the following types of professional activities:

Scientific and Technical Competencies – the ability to systematically study scientific and technical information and accumulated experience, to find solutions to studied problems through the development of models and algorithms. Competence is formed in modeling technological processes using computer programs and automated design tools, working on new innovative projects, and applying the results of scientific research in practice.

Expert-Analytical Competencies – skills in collecting, processing, and analyzing information; creating database queries; identifying trends; testing hypotheses; conducting experiments; and making conclusions aimed at solving specific problems based on the obtained results.

Information and Communication Competencies – the ability to effectively distribute tasks in teamwork, express one's own opinion in a professional environment, present work results to a professional audience, and establish effective communication with colleagues.

EDUCATIONAL PROGRAM LEARNING OUTCOMES

PO1 Applies effective communications in a multicultural environment based on the principles of inclusiveness and equality, demonstrates leadership qualities to manage a team and resources in the implementation of socially and economically sound projects.

LO2 Possesses high-level critical and creative thinking skills, capable of self-regulation and reflection to solve professional problems

LO3 Apply ethical and legal standards in research and the use of digital technologies, security measures to protect data, and promote the active, safe and ethical use of digital resources.

LO4 Masters mathematical methods of analysis and modeling, applies the fundamentals of higher and discrete mathematics, probability theory and decision making to formalize problems and justify decisions in the field of information technology.

PO5 Develops software solutions using the principles of algorithmization, OOP and visual programming using modern development tools.

PO6 Applies methods of designing and managing corporate information systems using databases, machine learning technologies, Big Data and cloud computing.

PO7 Apply concepts of operating systems, computer networks, and information security to build robust computing systems.

PO8 Develops digital applications based on graphic, web and mobile technologies, integrating elements of robotics to support automated processes.

PO9 Designs and models business processes using IT infrastructure and software tools, manages IT projects at all stages of their implementation.

PO10 Develops intelligent information and software systems using artificial intelligence and machine learning methods.

Matrix of comparison of learning outcomes in the EP with graduate attributes

	RO 1	RO 2	RO 3	RO 4	RO 5	RO 6	RO 7	RO 8	RO 9	LO10
AB1		+	+	+	+	+	+	+	+	+
AB 2	+		+							
AB 3	+	+		+		+			+	+
AB 4	+	+	+							
AB 5	+		+		+				+	
AB 6		+		+	+	+	+	+	+	+

REFERENCES

The educational program is developed based on the following legal acts:

1. "Development of artificial Intelligence Applications" is a digital platform of the National Qualifications System, <https://career.enbek.kz/ru>
2. "Project Management" – Appendix No. 93 to the Order of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" dated December 26, 2019 No. 263
3. "Software Development" – National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken", Order No. 222 dated December 5, 2022
4. "Software Testing" – Appendix No. 12 to the Order of the Acting Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken", Order No. 222 dated December 5, 2022
5. "Development of systems for processing and storing large amounts of data" – The digital platform of the National Qualifications System, <https://career.enbek.kz/kk/professionalstandart/585>
6. "System and Network Administration" – National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken", Order No. 222 dated December 5, 2022
7. "Development of graphic and multimedia design" – National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken", Order No. 222 dated December 5, 2022