MINISTRY OF SCIENCE AND HIGHER EDUCATION
OF THE REPUBLIC OF KAZAKHSTAN
Non-Profit Joint-Stock Company
"Almaty University of Power Engineering and Telecommunications named after Gumarbek Daukeyev"
Institute of Automation and Information Technologies

«Agreed»
Director for Development
LLP "ICORE-Integration"
_____E. Galimova
«12» 05 2025

«Approved»
Rector of AUPET
_____G.S. Nygyometov
«23» 04 2025

MODULAR EDUCATIONAL PROGRAM

«6B06307 - System and Network Administration»

HIGHER EDUCATION

Field of Education: 6B06 Information and Communication Technologies
Training Area: 6B058 Information Security

Duration of Study: 4 years
Awarded Academic Degree: *Bachelor in the field of Information and Communication* Technologies under the educational program 6B06307 - System and Network Administration
Qualification Level according to the National Qualifications Framework: Level 6

Almaty 2025

The Educational Program is developed based on:

The National Qualifications Framework, approved by the minutes of March 16, 2016, by the Republican Tripartite Commission on Social Partnership and Regulation of Social and Labor Relations;

The Sectoral Qualifications Framework "Information and Communication Technologies";

The Professional Standard "Information Security" (Annex No. 3 to Order No. 222 dated December 5, 2022, issued by the Acting Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken").

Professional Standards:

- "Network, System, and Server Administrators" (December 5, 2018);
- "System and Network Administration", Annex No. 11 to Order No. 222 dated December 5, 2022, issued by the Acting Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken";
- "Database Administration", Annex No. 11 to Order No. 222 dated December 5, 2022, issued by the Acting Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken";
- the State Compulsory Standard of Higher Education, approved by Resolution No. 2 of the Government of the Republic of Kazakhstan dated July 20, 2022, and registered with the Ministry of Justice of the Republic of Kazakhstan on July 27, 2022, under No. 28916.

The Educational Program was developed by the Department of Cybersecurity.

Head of the Educational Program: PhD in Engineering, Professor E.G. Satimova

Contributors to the development of the Educational Program:

PhD, Associate Professor E.E. Begimbaeva;

Candidate of Pedagogical Sciences, Associate Professor of the Department of Cybersecurity R.Sh. Berdibayev, AUPET.

The Educational Program was reviewed and approved at the meeting of the **Department of Cybersecurity** on **April 25, 2025**, Minutes No. 9.

Head of the Department of Cybersecurity _____ *E.E. Begimbaeva*

The Educational Program was reviewed and approved at the meeting of the Academic Council of the Institute of Automation and Information Technologies,

Minutes No. 9 dated May 12, 2025..

Director of the Institute of Automation and Information Technologies _____ I.A. Fedorenko

The Educational Program was reviewed and approved at the meeting of the Educational and Methodological Council of AUPET,

Minutes No. 11 dated May 23, 2025.

The new Educational Program is registered in the Registry.

Date of status assignment: July 28, 2025

Learning Outcome Achievement Rate: 82.20%

List of Symbols and Abbreviations

HE	Higher Education
SCES	State Compulsory Educational Standard
EQF	European Qualifications Framework
NOC	National Occupational Classifier
RK	Republic of Kazakhstan
NQS	National Qualifications Framework
NQS	National Qualifications System
GEM	General Education Module
EP	Educational Program (EP)
GED	General Education Disciplines
MC	Mandatory Component
UC	University Component
BD	Basic Disciplines
MD	Major (Core) Disciplines
ILP	Individual Learning Pathway
SQF	Sectoral Qualifications Framework
PS	Professional Standard
PE	Postgraduate Education
C	Competencies
LO	Learning Outcome
CW	Course Work
CGW	Calculation and Graphic Work
SRW	Students' Research Work
CEC	Catalogue of Elective Courses

1. Educational Program Passport

№	Field Name	Note
1	Registration Number	6B06100050
2	Code and Classification of the Field of Education	6B06- Information and Communication Technologies
3	Code and Classification of the Training Area	6B063- Information Security
4	Group of Educational Programs	B058 - Information Security
5	Title of the Educational Program	6B06307 - System and Network Administration
6	Type of Educational Program	Active Educational Program
7	Objective of the Educational Program	The objective of the Educational Program "System and Network Administration" is to train highly qualified specialists in ensuring the functionality of local, corporate, and global server technologies, as well as in system, network, and database administration. Graduates will be capable of solving complex tasks related to the installation, configuration, maintenance, and protection of the information infrastructure of organizations of various scales.
8	Qualification Level according to NQF	NQF Level 6 – Bachelor's Degree or its Equivalent
9	Level according to the National Qualifications Framework (NQF)	6
10	Level according to the Sectoral Qualifications Framework (SQF)	6
11	Distinctive Features of the Educational Program	No
	Partner University (for the Core Educational Program – CEP)	No
	Partner University (for Additional/Advanced Educational Programs – AEP)	No
12	List of Competencies	ON1. Demonstrates knowledge of the historical development, traditions, cultural heritage, and constitutional system of the Republic of Kazakhstan. Exhibits competitiveness and the ability for self-development and critical reflection on accumulated experience, with a well-formed worldview, civic, and moral positions. Capable of independent learning and professional growth, proficient in modern digital technologies, and able to utilize resources for skill enhancement.
13	Learning Outcomes	

		ON2. Demonstrates and applies fundamental knowledge in mathematics, natural sciences, humanities, social sciences, economics, and law within an interdisciplinary context. Possesses skills in analysis, critical thinking, and problem-solving. Demonstrates interpersonal communication skills, teamwork, conflict resolution, and effective interaction with colleagues and clients. Capable of organizing collaborative activities, adapting to changes, and making prompt decisions in non-standard situations. Exhibits initiative and leadership qualities.. ON3. Possesses professional competencies for designing network infrastructure, installing, and maintaining local and distributed organizational networks. Implements network protection against attacks, configures firewalls, VPNs, and intrusion detection/prevention systems (IDS/IPS). Skilled in developing and deploying systems for effective system and network administration. Demonstrates the ability to administer local area networks and perform routine maintenance tasks. Ensures the functionality of cabling systems and corporate networks within the organization. ON4. Possesses knowledge of international and domestic regulatory legal acts, legislation, and rules in the field of information technologies and information security. Demonstrates understanding of certification and standardization processes. Complies with requirements of normative and technical documentation and has experience in preparing project documentation. Familiar with research methods and academic writing. ON5. Demonstrates knowledge of the hardware base, architecture, and operating systems of computer systems and networks, as well as their security organization and management. Capable of configuring operating system security policies; proficient in modern algorithm and software development technologies, programming languages, debugging techniques, and problem-solving. Familiar with software technologies and programming methods for information management and protection of information processes. ON6. Demonstrates experience in creating and administering databases, maintaining their stable operation, performing backup and recovery, and ensuring the security of database management systems (DBMS) and stored information. Applies machine learning and artificial intelligence methods, and possesses technologies for big data processing. ON7. Utilizes modern hardware abstraction technologies in IT infrastructure management, including containerization and virtualization. Deploys virtual machines. Possesses skills in developing comprehensive solutions to assess application resilience against unauthorized access, including web application security. Capable of implementing security control mechanisms and making informed choices of technologies, tools, and computing equipment.

		ON8. Ensures organizational system security. Capable of installing and configuring information security tools, performing their setup, testing, and maintenance. Administers processes for detecting and diagnosing errors in network devices and software. Monitors information security, assesses risks, and develops disaster recovery plans, including backup and fault tolerance measures. Possesses practical skills in installing, configuring, and maintaining video surveillance systems and access control systems (ACS) within the organization. ON9. Ensures the functionality of server hardware and software, administers infrastructure across various operating systems, installs and configures domain infrastructure, and works with cloud platforms and services. Automates administrative tasks using scripts and configuration management tools. Applies knowledge in assembling, installing, configuring, and maintaining network and server equipment, ensuring its security and configuring operating system security policies. ON10. Possesses skills in applying cryptographic algorithms, understands the specifics of their software implementation, key management, encryption, and information protection. Utilizes programming and cryptographic methods for administration, firewall configuration, and the implementation of cybersecurity measures. (Appendix 1)
14	Form of Study	Full-time, Distance Learning
15	Language of Instruction	Kazakh, Russian, English
16	Total Credits	240
17	Awarded Academic Degree	Bachelor in Information Security under the Educational Program 6B06307 – "System and Network Administration"
18	Availability of an Appendix to the License for the Training Area	License Number: KZ80LAA00018161 Date of License Issue: May 5, 2020
19	Availability of Program Accreditation:	-
	Name of the Accreditation Authority	-"
	Accreditation Validity Period	-
20	Course Details	Information on Courses: Mandatory/University Core, Basic, and Major Disciplines (Appendix 1)
21	Field of Professional Activity	The field of science, engineering, and technology, encompassing the set of problems related to ensuring the security of information objects in the presence of threats within the information domain.
22	Types of Professional Activity	Operational; Design and Technological; Experimental and Research; Organizational and Managerial.
23	Modular Curriculum	Provided in Appendix 2
24	Atlas of New Professions	IT Ethics Consultant – https://atlasbt.enbek.kz/profession/79

		Edge Computing Engineer – https://atlasbt.enbek.kz/profession/59 Distributed Ledger Designer – https://atlasbt.enbek.kz/profession/52

2. Matrix correlating learning outcomes for the educational programme as a whole with the competencies being develope

№	Name of discipline	ON1	ON2	ON3	ON4	ON5	ON6	ON7	ON8	ON9	ON10
1	Economics and law, entrepreneurship and financial literacy	V									
2	Administration of the Windows operating system					V					
3	Big Data Analysis (Big Data)						V				
4	Computer Systems Architecture					V					
5	Probability and statistics		V								
6	Discrete Structures		V								
7	Calculus I		V								
8	Calculus II		V								
9	Artificial intelligence						V				
10	Linear Algebra		V								
11	Operating systems. Linux					V					
12	Fundamentals of hardware information protection					V					
13	Fundamentals of scientific research and academic writing				V						
14	Fundamentals of database systems						V				
15	Legal support of professional activity				V						
16	Programming algorithms and data structures					V					
17	Technologies of Computer Information Security								V	V	
18	System Programming Technologies					V					
19	Python technologies in system administration					V					V
20	Sustainable Development: Ethics, Inclusion and Safety		V								
21	Physics		V								
22	Wireless networks. Huawei Technologies			V		V					
23	Learning about Huawei network technologies			V		V					

24	CCNAv7: Introduction to Networks			V		V					
25	CCNAv7: Switching, Routing and Wireless Essentials			V		V					
26	Administration and security of network operating systems					V					
27	Administration of database management systems						V				
28	Introduction to DevOps Practices					V		V			
29	Computer forensics				V				V		
30	Criptographical methods and means of protection information										V
31	DevSecOps Practices					V			V		
32	Standardization, certification and technical documentation				V						
33	Information risk management of computer systems								V		
34	Administration of server systems									V	
35	Hardware and software administration platforms. Data Storage Systems					V			V		
36	Integrated Access Control Systems								V		
37	Ensuring data center Resilience			V					V		
38	Cloud computing. Huawei Technologies							V		V	
39	Cloud technologies and virtualization							V		V	
40	Learning about Huawei network technologies			V					V		
41	Hardware and software tools for system administration								V		
42	Designing systems of physical data protection								V		
43	Windows Server Management and Security									V	
44	Data Center Reliability Management								V	V	
45	CCNAv7: Enterprise Networking, Security and Automation			V					V		
46	WEB servers. Application Security Testing					V		V			
47	WEB servers: setup and administration							V		V	