Ministry of Science and Higher Education of the Republic of Kazakhstan
Korkyt Ata Kyzylorda University
Institute of Artificial Intelligence

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«26» 04 2024.

GRADUATE PROFILE
Bachelor of the Joint Educational Program with Seoul National University of Science and Technology
"6B06303 - Cybersecurity"

Kyzylorda, 2024

CONTENTS

INTRODUCTION

The graduate profile of Korkyt Ata Kyzylorda University represents a comprehensive learning outcome across all levels of education provided by the university. It is recommended for use in the development of educational programs.

Creating a competency-based graduate profile is a crucial requirement for implementing the main objectives of the Bologna Process and addressing the demands of the modern labor market. The competency model of a graduate (bachelor's degree) is designed to answer the question of which professional tasks a specialist of a certain rank and profile should be able to solve. Developing a modern graduate profile that meets the expectations of all stakeholders is the main strategic goal of Korkyt Ata Kyzylorda University and is supported by the necessary resources for the educational process, including human, methodological, informational, and material-technical resources.

DESCRIPTION OF THE EDUCATIONAL PROGRAM

The educational program 6B06302 – Cybersecurity is aimed at training specialists with the knowledge and skills necessary to ensure the protection of data, critical infrastructures, and digital systems from cyber threats. The program considers modern challenges in the field of information security and complies with national and international standards.

The primary goal of the program is to develop professional competencies in graduates necessary for the development, implementation, and management of cybersecurity systems, protection of information resources, and ensuring the resilience of digital ecosystems.

KEY COMPONENTS IN DEVELOPING THE GRADUATE PROFILE OF THE EDUCATIONAL PROGRAM

2.1 Objectives of the Educational Program:

- Training specialists capable of developing and implementing protection systems to prevent cyber threats.
- Developing skills in risk management, vulnerability analysis, and incident response in the cybersecurity sphere.
- Mastering modern technologies such as blockchain, cryptography, AI, and biometric systems to ensure security.

2.2 Tasks of the Educational Program:

- Teaching the fundamentals of information protection, network security, and penetration testing (PenTesting).
- Developing skills in threat monitoring and analysis using SIEM systems.
- Building competencies in developing security policies and implementing ISO/IEC 27001 standards.
- Preparing for incident investigation and securing cloud and virtual infrastructures.
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1.3 General and Professional Competencies:

General Competencies:

- Understanding the fundamentals of mathematical and technical modeling.

- Proficiency in analytical thinking and big data analysis.
- Ability to make decisions in non-standard situations.
- Capability to organize collaborative activities and work in a team.
- Skills in project management and critical risk analysis.

Professional Competencies:

- Development and implementation of cybersecurity systems in compliance with modern standards.
- Conducting security audits and vulnerability assessments.
- Application of cryptographic methods and data protection technologies.
- Creation of software solutions for preventing and responding to cyberattacks.
- Utilization of SIEM systems, machine learning, and AI for threat detection and analysis.
- Protection of cloud and virtual systems, as well as enterprise-level information security management.

1.4 Matrix of Correlation Between Educational Program Learning Outcomes and Developed Competencies

Competencies	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
GC 1	+						
GC 2	+						
GC 3	+						
GC 4	+						
GC 5	+						
GC 6	+						
GC 7	+						
GC 8	+						
GC 9	+						
GC 10	+						
GC 11	+						
GC 12	+						
GC 13							+

SC 1			+				
SC 2	+						
SC 3		+					
SC 4					+		
SC 5			+				
SC 6	+						
SC 7		+					
SC 8							+
SC 9		+					
SC 10			+				
SC 11	+						
SC 12			+				
SC 13					+		
SC 14			+				
SC 15	+						
SC 16			+				
SC 17					+		
SC 18						+	
SC 19						+	
SC 20							+
SC 21		+					
SC 22						+	
SC 23					+		
SC 24		+					
SC 25					+		
SC 26				+			
SC 27			+				
SC 28							+
SC 29						+	
SC 30						+	
PC 1						+	
PC 2						+	
PC 3				+			
PC 4					+		
PC 5					+		
PC 6				+			
PC 7						+	
PC 8				+			
PC 9				+			+
PC 10						+	

PO 1	Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.

PO 2	Proficient in data science fundamentals, ensures basic information security. Programs in C++, Python, and web development, creating and developing software products for various purposes and platforms.
PO 3	Knows the basics of mathematics and physics, including algebra, geometry, mechanics, probability theory, and statistics. Can analyze data and make decisions, uses Linux and C#, applies mathematical modeling, proficient in discrete data structures and algorithms.
PO 4	Knows the basics of biometric technologies and HCI, understands interface design principles for optimizing UX. Works with deep learning models using TensorFlow, applies them in machine learning and AI, proficient in natural language processing and computer vision.
PO 5	Understands principles of database organization, management, and protection, including integrity and confidentiality. Knowledgeable in computer networks and telecommunications, administers system security, manages access and threat monitoring, conducts security audits, and models information security to eliminate vulnerabilities.
PO 6	Knows network security, including Cisco equipment. Knowledgeable in cryptography and digital circuitry. Can secure web applications, wireless networks, and big data, understands legal aspects of information security, proficient in ethical hacking and quantum cryptography.
PO 7	Knows basics of labor protection and law, anti-corruption culture, environmental standards, assesses economic risks. Proficient in project management methods in R&D and IT.

1.3 Personal Qualities of a Specialist in the Field of Cybersecurity:

- Analytical and critical thinking.
- Responsibility and attention to detail.
- Technical curiosity and creativity in problem-solving.
- Ability to work under stress and respond promptly to threats.
- Organization and discipline.
- Professional ethics and integrity.
- Capability for self-learning and continuous development.
- Time management and task prioritization skills.
- Commitment to innovation and adoption of new technologies, including AI in cybersecurity.

CONCLUSION

The graduate profile of the educational program "Cybersecurity" ensures the development of essential knowledge, skills, and competencies for successful professional activity in the field of information system protection. Graduates of this program possess high demand in the labor market, the ability to solve complex problems in the digital environment, and adapt to new challenges in information security. The university continues to enhance its educational programs to prepare specialists capable of effectively responding to modern cyber threats and implementing advanced information protection technologies.

Appendix 1

Competency-Based Graduate Profile

Module	DDB (Dublin Descriptors for Bachelor's Degree)	Developed Competencies			Planned Learning Outcomes
		General Education Competencies	Basic Competencies	Specialized Competencies	
1	2	3	4	5	6
M1	DDB1 DDB2 DDB3 DDB4 DDB5	GC 1	SC2		PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1 DDB2 DDB3 DDB4 DDB5	GC 2	SC 6		PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1 DDB2 DDB3 DDB4 DDB5	GC 3	SC11		PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1 DDB2 DDB3 DDB4 DDB5	GC 4	SC15		PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1 DDB2 DDB3 DDB4 DDB5	GC 5			PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1 DDB2 DDB3 DDB4 DDB5	GC 6			PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation
	DDB1 DDB2 DDB3 DDB4	GC 8			PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.

	DDB5				
	DDB1 DDB2 DDB3 DDB4 DDB5	GC 9			PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1 DDB2 DDB3 DDB4 DDB5	GC 10			PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1 DDB2 DDB3 DDB4 DDB5	GC 11			PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation
	DDB1 DDB2 DDB3 DDB4 DDB5	GC 12			PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation
M2	DDB1 DDB2 DDB3 DDB4 DDB5	OK 8	SC7		PO 2 Proficient in data science fundamentals, ensures basic information security. Programs in C++, Python, and web development, creating and developing software products for various purposes and platforms.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC8		PO 2 Proficient in data science fundamentals, ensures basic information security. Programs in C++, Python, and web development, creating and developing software products for various purposes and platforms.
M3	DDB1 DDB2 DDB3 DDB4 DDB5		SC1		PO 3 Knows the basics of mathematics and physics, including algebra, geometry, mechanics, probability theory, and statistics. Can analyze data and make decisions, uses Linux and C#, applies mathematical modeling, proficient in discrete data structures and algorithms.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC3		PO 3 Knows the basics of mathematics and physics, including algebra, geometry, mechanics, probability theory, and statistics. Can analyze data and make decisions, uses Linux and C#, applies mathematical modeling, proficient in discrete data structures and algorithms.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC5		PO 3 Knows the basics of mathematics and physics, including algebra, geometry, mechanics, probability theory, and statistics. Can analyze data and make decisions, uses Linux and C#, applies mathematical modeling, proficient in discrete data structures and algorithms.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC12		PO 3 Knows the basics of mathematics and physics, including algebra, geometry, mechanics, probability theory, and statistics. Can analyze data and make decisions, uses Linux and C#, applies mathematical modeling, proficient in discrete data structures and algorithms.
	DDB1 DDB2		SC16		PO 3 Knows the basics of mathematics and physics, including algebra,

	DDB3 DDB4 DDB5				geometry, mechanics, probability theory, and statistics. Can analyze data and make decisions, uses Linux and C#, applies mathematical modeling, proficient in discrete data structures and algorithms.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC22		PO 3 Knows the basics of mathematics and physics, including algebra, geometry, mechanics, probability theory, and statistics. Can analyze data and make decisions, uses Linux and C#, applies mathematical modeling, proficient in discrete data structures and algorithms.
M4	DDB1 DDB2 DDB3 DDB4 DDB5		SC27	PC 3	PO 4 Knows the basics of biometric technologies and HCI, understands interface design principles for optimizing UX. Works with deep learning models using TensorFlow, applies them in machine learning and AI, proficient in natural language processing and computer vision.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC28	PC 6	PO 4 Knows the basics of biometric technologies and HCI, understands interface design principles for optimizing UX. Works with deep learning models using TensorFlow, applies them in machine learning and AI, proficient in natural language processing and computer vision.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC15	PC 8	PO 4 Knows the basics of biometric technologies and HCI, understands interface design principles for optimizing UX. Works with deep learning models using TensorFlow, applies them in machine learning and AI, proficient in natural language processing and computer vision.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC17	PC 9	PO 4 Knows the basics of biometric technologies and HCI, understands interface design principles for optimizing UX. Works with deep learning models using TensorFlow, applies them in machine learning and AI, proficient in natural language processing and computer vision.
M5	DDB1 DDB2 DDB3 DDB4 DDB5		SC4	PC 4	PO 5 Understands principles of database organization, management, and protection, including integrity and confidentiality. Knowledgeable in computer networks and telecommunications, administers system security, manages access and threat monitoring, conducts security audits, and models information security to eliminate vulnerabilities.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC9	PC 5	PO 5 Understands principles of database organization, management, and protection, including integrity and confidentiality. Knowledgeable in computer networks and telecommunications, administers system security, manages access and threat monitoring, conducts security audits, and models information security to eliminate vulnerabilities.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC10		PO 5 Understands principles of database organization, management, and protection, including integrity and confidentiality. Knowledgeable in computer networks and telecommunications, administers system security, manages access and threat monitoring, conducts security audits, and models information security to eliminate vulnerabilities.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC13		PO 5 Understands principles of database organization, management, and protection, including integrity and confidentiality. Knowledgeable in computer networks and telecommunications, administers system security, manages access and threat monitoring, conducts security audits, and models information security to eliminate vulnerabilities
	DDB1 DDB2		SC14		PO 5 Understands principles of database organization, management, and

	DDB3 DDB4 DDB5				protection, including integrity and confidentiality. Knowledgeable in computer networks and telecommunications, administers system security, manages access and threat monitoring, conducts security audits, and models information security to eliminate vulnerabilities
	DDB1 DDB2 DDB3 DDB4 DDB5		SC17		PO 5 Understands principles of database organization, management, and protection, including integrity and confidentiality. Knowledgeable in computer networks and telecommunications, administers system security, manages access and threat monitoring, conducts security audits, and models information security to eliminate vulnerabilities
	DDB1 DDB2 DDB3 DDB4 DDB5		SC20		PO 5 Understands principles of database organization, management, and protection, including integrity and confidentiality. Knowledgeable in computer networks and telecommunications, administers system security, manages access and threat monitoring, conducts security audits, and models information security to eliminate vulnerabilities.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC23		PO 5 Understands principles of database organization, management, and protection, including integrity and confidentiality. Knowledgeable in computer networks and telecommunications, administers system security, manages access and threat monitoring, conducts security audits, and models information security to eliminate vulnerabilities.
M6	DDB1 DDB2 DDB3 DDB4 DDB5			PC 1	PO 6 Knows network security, including Cisco equipment. Knowledgeable in cryptography and digital circuitry. Can secure web applications, wireless networks, and big data, understands legal aspects of information security, proficient in ethical hacking and quantum cryptography.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC18	PC 2	PO 6 Knows network security, including Cisco equipment. Knowledgeable in cryptography and digital circuitry. Can secure web applications, wireless networks, and big data, understands legal aspects of information security, proficient in ethical hacking and quantum cryptography.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC25	PC 7	PO 6 Knows network security, including Cisco equipment. Knowledgeable in cryptography and digital circuitry. Can secure web applications, wireless networks, and big data, understands legal aspects of information security, proficient in ethical hacking and quantum cryptography.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC26	PC 9	PO 6 Knows network security, including Cisco equipment. Knowledgeable in cryptography and digital circuitry. Can secure web applications, wireless networks, and big data, understands legal aspects of information security, proficient in ethical hacking and quantum cryptography.

	DDB1 DDB2 DDB3 DDB4 DDB5		SC29	PC 10	PO 6 Knows network security, including Cisco equipment. Knowledgeable in cryptography and digital circuitry. Can secure web applications, wireless networks, and big data, understands legal aspects of information security, proficient in ethical hacking and quantum cryptography.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC30		PO 6 Knows network security, including Cisco equipment. Knowledgeable in cryptography and digital circuitry. Can secure web applications, wireless networks, and big data, understands legal aspects of information security, proficient in ethical hacking and quantum cryptography.
M7	DDB1 DDB2 DDB3 DDB4 DDB5	GC 13			PO 7 Knows basics of labor protection and law, anti-corruption culture, environmental standards, assesses economic risks. Proficient in project management methods in R&D and IT.

M1 - Socio-Cultural Knowledge
M2 - Propaedeutics
M3 - Basic Knowledge
M4 - Fundamental Knowledge
M5 - Social Methods and Technologies
M6 - Social Models
M7 - Science, Innovation, and Educational Work
M8 - Final Attestation