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GRADUATE MODEL

Bachelor of the Joint Educational Program with Seoul National University of Science and Technology**"6B06101 - Information Systems"**

Kyzylorda, 2024

CONTENTS

INTRODUCTION

The graduate model of Korkyt Ata Kyzylorda University represents a comprehensive reflection of learning outcomes achieved at all levels of education within the university. This model is recommended for use in the development of educational programs.

The development of a graduate's competency model is a crucial condition for implementing the main directions of the Bologna process and meeting the demands of the modern labor market. The competency model of a bachelor graduate is designed to determine which professional tasks a specialist of a particular rank and profile should be able to solve. Forming a modern university graduate model that meets the needs of all stakeholders is the primary strategic goal of Korkyt Ata University. This goal is achieved by ensuring the educational process is equipped with the necessary human resources, educational and methodological support, informational and material-technical resources. The university is actively pursuing a targeted staffing policy and systematically improving its material-technical base to ensure the quality preparation of bachelors in demand in the labor market.

DESCRIPTION OF THE EDUCATIONAL PROGRAM

The 6B06101 – Information Systems educational program is aimed at training specialists with knowledge and skills in developing, implementing, and maintaining information systems. The program considers the modern requirements of digital transformation and labor market needs, providing students with advanced tools for data analysis, programming, and designing digital solutions.

The main goal of the program is to develop professional competencies in graduates, enabling them to work effectively in the IT field, introduce innovative technologies, and support the development of information systems in various sectors, including business, education, healthcare, and industry.

COMPONENTS OF THE GRADUATE MODEL FORMATION FOR THE EDUCATIONAL PROGRAM

The graduate model includes the objectives and tasks of the educational program, the objects, types, and directions of professional activity, as well as the competency model. This model describes descriptors, various types of competencies aligned with the educational program, and the learning outcomes of the program (Appendix 1).

2.1 Objectives of the Educational Program:

Training competitive professionals for the labor market, including those with competencies in modern IT technologies, programming technologies, and artificial intelligence. The program aims to prepare specialists capable of working in computer and information services of government agencies, industrial enterprises, financial organizations, research institutes, project organizations, and educational institutions, as well as managing startups in high-tech industries.

2.2 Tasks of the Educational Program:

- Training specialists capable of designing, developing, and maintaining information systems that ensure efficient data processing and management across various sectors.

2.3 General and Professional Competencies:

General:

- Understands the fundamental principles and methods of mathematics, natural sciences, and technical disciplines for solving professional tasks.
- Comprehends the theoretical foundations of information technologies and their application in various fields.
- Can make organizational and technical decisions in non-standard situations and takes responsibility for them.
- Possesses skills in working with software and information systems.
- Applies regulatory and legal documents in professional activities.
- Mastered methods of searching, storing, processing, and transmitting data using modern information technologies.
- Understands the basics of project management and organizational activities.

Professional:

- Develops, implements, and maintains information systems in accordance with modern standards and requirements.
- Designs the architecture of information systems, including databases and user interfaces.
- Applies methods of machine learning, Data Science, and big data analytics.
- Develops solutions using blockchain and IoT technologies.
- Ensures data protection and information security at the enterprise level.
- Tests and optimizes software, improving its performance and reliability.

1.1 Matrix of Alignment between the Learning Outcomes of the Educational Program and the Competencies to Be Developed

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							+
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						+	
PC 1		+					
PC 2					+		
PC 3						+	
PC 4					+		
PC 5		+					
PC 6					+		
PC 7				+			
PC 8					+		
PC 9					+		
PC 10					+		+

PC 11				+			
PC 12				+			

PO 1	Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
PO 2	Knows IT infrastructure, theory of electrical circuits, and edge computing architecture. Analyzes technical concepts and applies them to solve problems. Understands the interrelation and principles of work of system components.
PO 3	Knows basics of mathematics, physics, probability theory, statistics, discrete and actuarial mathematics, numerical methods. Analyzes mathematical and physical concepts, applying them to solve problems
PO 4	Knows principles of algorithmization, data structures, programming in Visual C# and Java, basics of SQL. Proficient in operating systems, UI/UX development, information security and experienced in creating mobile and AR/VR applications in Unity
PO 5	Knows Python for Data Science and AI, basics of TensorFlow for deep learning. Works with IoT, computer vision, machine learning methods, proficient in big data analysis and developing solutions based on blockchain technologies
PO 6	Knows administration of IS, working with 1C for accounting, enterprise architecture management, and ERP systems. Configures and maintains computer networks, optimizing their performance
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

2.5 Personal Qualities of a Specialist in the Field of Social Work:

- Analytical and critical thinking;
- Technical curiosity;
- Responsibility and organizational skills;
- Creativity and initiative;
- Stress resistance and adaptability to new technologies;
- Teamwork and leadership skills;
- Aspiration for self-development and professional growth;
- Understanding and application of artificial intelligence technologies to solve complex professional tasks;
- Ability to integrate AI-based solutions into business processes and industrial systems.

CONCLUSION

This graduate model serves as the methodological foundation for implementing a competency-based approach. It is also important to understand that the development of these competencies in graduates is ensured through a well-organized and implemented educational

process. In market conditions, universities are paying increasing attention to the quality of graduates, as the graduate is the key outcome of university education entering the labor market. They must be competitive. To prepare graduates in demand in the labor market, it is necessary to create their comprehensive portrait—a matrix of specific characteristics. From understanding the key advantages, characteristics, and competencies of graduates needed by employers, it is possible to transition to building a modern and effective university: developing educational programs, creating infrastructure, and utilizing new learning formats.

Appendix 1

Graduate Competency Model

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	GC1	SC 2		PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1 DDB2 DDB3 DDB4 DDB5	GC2	SC 5		PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1 DDB2 DDB3 DDB4 DDB5	GC3	SC 9		PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1 DDB2 DDB3 DDB4 DDB5	GC4	SC 10		PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1 DDB2 DDB3 DDB4 DDB5	GC5	SC 14		PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1 DDB2 DDB3 DDB4 DDB5	GC6			PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1 DDB2 DDB3 DDB4 DDB5	GC8			PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1	GC9			PO 1

	DDB2 DDB3 DDB4 DDB5				Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1 DDB2 DDB3 DDB4 DDB5	GC10			PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
	DDB1 DDB2 DDB3 DDB4 DDB5	GC11			PO 1 Knows foreign languages (English, Korean). Has skills in intercultural interaction and social process evaluation.
M2	DDB1 DDB2 DDB3 DDB4 DDB5		SC 7	PC 1	PO 2 Knows IT infrastructure, theory of electrical circuits, and edge computing architecture. Analyzes technical concepts and applies them to solve problems. Understands the interrelation and principles of work of system components.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 8		PO 2 Knows IT infrastructure, theory of electrical circuits, and edge computing architecture. Analyzes technical concepts and applies them to solve problems. Understands the interrelation and principles of work of system components.
M3	DDB1 DDB2 DDB3 DDB4 DDB5		SC 1		PO 3 Knows basics of mathematics, physics, probability theory, statistics, discrete and actuarial mathematics, numerical methods. Analyzes mathematical and physical concepts, applying them to solve problems.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 3		PO 3 Knows basics of mathematics, physics, probability theory, statistics, discrete and actuarial mathematics, numerical methods. Analyzes mathematical and physical concepts, applying them to solve problems.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 4		PO 3 Knows basics of mathematics, physics, probability theory, statistics, discrete and actuarial mathematics, numerical methods. Analyzes mathematical and physical concepts, applying them to solve problems.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 11		PO 3 Knows basics of mathematics, physics, probability theory, statistics, discrete and actuarial mathematics, numerical methods. Analyzes mathematical and physical concepts, applying them to solve problems.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 13		PO 3 Knows basics of mathematics, physics, probability theory, statistics, discrete and actuarial mathematics, numerical methods. Analyzes mathematical and physical concepts, applying them to solve problems.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 16		PO 3 Knows basics of mathematics, physics, probability theory, statistics, discrete and actuarial mathematics, numerical methods. Analyzes mathematical and physical concepts, applying them to solve problems.
M4	DDB1	GC7	SC 6	PC 7	PO 4

	DDB2 DDB3 DDB4 DDB5				Knows principles of algorithmization, data structures, programming in Visual C# and Java, basics of SQL. Proficient in operating systems, UI/UX development, information security and experienced in creating mobile and AR/VR applications in Unity
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 12	PC 11	PO 4 Knows principles of algorithmization, data structures, programming in Visual C# and Java, basics of SQL. Proficient in operating systems, UI/UX development, information security and experienced in creating mobile and AR/VR applications in Unity
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 15	PC 12	PO 4 Knows principles of algorithmization, data structures, programming in Visual C# and Java, basics of SQL. Proficient in operating systems, UI/UX development, information security and experienced in creating mobile and AR/VR applications in Unity
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 17		PO 4 Knows principles of algorithmization, data structures, programming in Visual C# and Java, basics of SQL. Proficient in operating systems, UI/UX development, information security and experienced in creating mobile and AR/VR applications in Unity
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 18		PO 4 Knows principles of algorithmization, data structures, programming in Visual C# and Java, basics of SQL. Proficient in operating systems, UI/UX development, information security and experienced in creating mobile and AR/VR applications in Unity
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 19		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
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 20		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
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 23		PO 4 Knows principles of algorithmization, data structures, programming in Visual C# and Java, basics of SQL. Proficient in operating systems, UI/UX development, information security and experienced in creating mobile and AR/VR applications in Unity
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 25		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
M5	DDB1 DDB2		SC 27	PC 2	PO 5 Knows Python for Data Science and AI, basics of TensorFlow for deep

	DDB3 DDB4 DDB5				learning. Works with IoT, computer vision, machine learning methods, proficient in big data analysis and developing solutions based on blockchain technologies
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 28	PC 4	PO 5 Knows Python for Data Science and AI, basics of TensorFlow for deep learning. Works with IoT, computer vision, machine learning methods, proficient in big data analysis and developing solutions based on blockchain technologies
	DDB1 DDB2 DDB3 DDB4 DDB5			PC 5	PO 2 Knows IT infrastructure, theory of electrical circuits, and edge computing architecture. Analyzes technical concepts and applies them to solve problems. Understands the interrelation and principles of work of system components.
	DDB1 DDB2 DDB3 DDB4 DDB5			PC 6	PO 5 Knows Python for Data Science and AI, basics of TensorFlow for deep learning. Works with IoT, computer vision, machine learning methods, proficient in big data analysis and developing solutions based on blockchain technologies
	DDB1 DDB2 DDB3 DDB4 DDB5			PC 8	PO 5 Knows Python for Data Science and AI, basics of TensorFlow for deep learning. Works with IoT, computer vision, machine learning methods, proficient in big data analysis and developing solutions based on blockchain technologies
	DDB1 DDB2 DDB3 DDB4 DDB5			PC 9	PO 5 Knows Python for Data Science and AI, basics of TensorFlow for deep learning. Works with IoT, computer vision, machine learning methods, proficient in big data analysis and developing solutions based on blockchain technologies
	DDB1 DDB2 DDB3 DDB4 DDB5			PC 10	PO 5 Knows Python for Data Science and AI, basics of TensorFlow for deep learning. Works with IoT, computer vision, machine learning methods, proficient in big data analysis and developing solutions based on blockchain technologies
M6	DDB1 DDB2 DDB3 DDB4 DDB5		SC 22	PC 3	PO 6 Knows administration of IS, working with 1C for accounting, enterprise architecture management, and ERP systems. Configures and maintains computer networks, optimizing their performance.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 24		PO 6 Knows administration of IS, working with 1C for accounting, enterprise architecture management, and ERP systems. Configures and maintains computer networks, optimizing their performance.
	DDB1 DDB2 DDB3 DDB4 DDB5		SC 26		PO 6 Knows administration of IS, working with 1C for accounting, enterprise architecture management, and ERP systems. Configures and maintains computer networks, optimizing their performance.

	DDB1 DDB2 DDB3 DDB4 DDB5		SC 29		PO 6 Knows administration of IS, working with 1C for accounting, enterprise architecture management, and ERP systems. Configures and maintains computer networks, optimizing their performance.
M7	DDB1 DDB2 DDB3 DDB4 DDB5	GC12			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 - Propedeutics
M3 - Core Knowledge
M4 - Fundamental Knowledge
M5 - Social Methods and Technologies
M6 - Social Models
M7 - Science, Innovations, and Educational Work
M8 - Final Attestation