

MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE REPUBLIC OF KAZAKHSTAN  
NJSC KORKYT ATA KYZYLORDA UNIVERSITY



**GRADUATE MODEL**

**Master's degree in the educational program**  
**7M06150 – Computer engineering and software is implemented**

Kyzylorda, 2023

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## INTRODUCTION

The graduate model of Korkyt Ata University is a comprehensive image of the result of studying at the university at all levels of education. The graduate model is recommended for use in the development of educational programs.

The development of a graduate's competence model is an important prerequisite for the implementation of the main directions of the Bologna process and a requirement of the modern labor market. The competence model of a graduate (bachelor) is designed to answer the question of what professional tasks a specialist of a certain rank (position), of a particular profile should be able to solve. The formation of a modern graduate model that meets the needs of all interested parties is the main strategic goal of Korkyt Ata University and is provided with the necessary resources for the educational process, including personnel, educational, methodological, informational and logistical support. The University conducts a targeted personnel policy and systematic improvement of the material and technical base of the university to ensure the quality of training of a bachelor graduate in demand in the labor market.

### 1. DESCRIPTION DESCRIPTION

The educational program 7M06150 – Computer engineering and software is implemented in order to develop the potential of higher education, taking into account the educational needs and requests of students. The educational program includes materials that ensure the quality of training of students and the introduction of appropriate educational technologies in the field of personnel training.

The main idea of the educational program is to implement the process of training specialists in social work of a new generation capable of performing labor functions aimed at providing specialized assistance, counseling, mediation, services in the social protection system, and the formation of their personality-oriented competencies.

### 2. THE CONSTITUENT COMPONENTS IN THE FORMATION OF THE GRADUATE MODEL OF THE EDUCATIONAL PROGRAM

The key components of the formation of the graduate Model of the educational program include information about the goals and objectives of the educational program, objects, types and directions of

professional activity, the competence model of a specialist (Appendix 1), including descriptors, a variety of competencies in accordance with the educational program, the results of the educational program.

### **2.1 Objectives of the Educational Program:**

Training of highly qualified researchers, competitive specialists in the field of development of hardware and software and computer Sciences for the forced innovative development of the economy of the Republic of Kazakhstan

### **2.2 Objectives of the Educational Program:**

To prepare a specialist who is proficient in modern information technologies, including methods of obtaining, processing and storing scientific information, who has fundamental knowledge in applied disciplines, with a high level of professional culture, who has the technical skills of designing, operating and managing computer-controlled equipment, including mathematical models and methods, used in decision support systems

#### **General:**

- knows paradigmatic theories in the history of science
- he knows the methodology of higher school pedagogy and the achievements of psychological science
- he is able to use knowledge of modern problems of science and education in solving professional tasks
- applies methods and means of cognition for intellectual development, improvement of cultural level, professional competence.

#### **Professional:**

- use the most appropriate technologies for the design and development of OT solutions, OT resource management based on the analysis of the information needs of the organization;
- apply the principles of IP project management in the enterprise;
- to use mathematical methods for modeling business processes of the organization and the formation of algorithms for the functioning of information systems;
- design and develop IC applications and algorithms for the functioning of IC modules based on domain analysis;
- design the IP infrastructure and architecture based on the analysis of the enterprise architecture;
- to form solutions to problems based on research in the field of information systems by integrating knowledge from new or interdisciplinary fields and taking into account social, ethical, linguistic and scientific considerations.

### **2.4 Matrix of correlation of learning outcomes of the educational program with the competencies being formed**

<b>Competencies</b>	<b>LO 1</b>	<b>LO 2</b>	<b>LO 3</b>
<b>GEC1</b>			+
<b>GEC 2</b>			+
<b>GEC 3</b>			+
<b>GEC 4</b>			+

<b>PC 1</b>	+		
<b>PC 2</b>	+		
<b>PC 3</b>	+		
<b>PC 4</b>	+		
<b>PC 5</b>	+		
<b>PC 6</b>	+		
<b>PC 7</b>		+	
<b>PC 8</b>	+		
<b>PC 9</b>	+		
<b>PC 10</b>		+	
<b>PC 11</b>	+		
<b>PC 12</b>	+		
<b>PC 13</b>		+	
<b>PC 14</b>		+	
<b>PC 15</b>		+	
<b>PC 16</b>	+		
<b>PC 17</b>	+		
<b>PC 18</b>	+		
<b>PC 19</b>	+		

LO 1	<p>LO 1</p> <p>Applies methods of actuarial mathematics, performs software verification, develops mathematical models of cluster systems, puts into practice modern methodologies for managing the life cycle and quality of systems, software tools and information technology services, is able to formulate requirements for virtual infrastructure, uses programming languages of modern computer mathematics systems, applies a modern mathematical apparatus in effective integration with instrumental computer mathematical tools, knows the technology of using cloud technologies</p>
LO 2	<p>LO 2</p> <p>Knows the programs and stages of empirical research, owns modern achievements in the field of information technology, knows methods for determining reliability indicators, has the skills to configure local networks, implement network protocols using software, uses neural networks to solve problems of classification, forecasting and management of objects of professional activity, analyzes modern data streams; can find, extract and structure data; able to solve typical problems using methods of reliability of technical systems and protection of information from unauthorized access</p>
LO 3	<p>LO 3</p> <p>Knows paradigmatic theories in the history of science, knows the methodology of pedagogy of higher education and the achievements of psychological science, knows how to use knowledge of modern problems of science and education in solving professional problems, applies methods and means of knowledge for intellectual development, raising the cultural level, professional competence.</p>

### 2.5. Personal qualities of a social work specialist:

- purposefulness,
- responsibility,

- determination,
- initiative,
- communication skills,
- poise,
- decency,
- integrity,
- honesty,
- self-control,
- independence,
- stress resistance,
- energy,
- polite,
- patience,
- enthusiasm.

## **CONCLUSIONS**

This graduate model is the methodological basis for the implementation of the technology of the competence approach. It is also important to understand that the formation of these competencies in a graduate is ensured through a certain way organized and implemented educational process. In market conditions, universities are beginning to pay more attention to the quality of graduates: after all, a graduate is exactly the result of university education that enters the labor market. And it has to be competitive. It is in order to prepare graduates in demand on the market that it is necessary to form a comprehensive portrait of him, a certain matrix of characteristics. From understanding the key advantages, characteristics, and competencies of graduates that employers need, it is possible to move on to creating an effective modern university: to form educational programs, create infrastructure, and use new learning formats.

### The graduate's competence model

Module	ДДБ (Dublin Descriptors of bachelor)	Emerging competencies			Planned learning outcomes
		general education competencies	general education competencies	general education competencies	
1	2	3	4	5	6
M1	ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5	GEC 1			LO 3 Knows paradigmatic theories in the history of science, knows the methodology of pedagogy of higher education and the achievements of psychological science, knows how to use knowledge of modern problems of science and education in solving professional problems, applies methods and means of knowledge for intellectual development, raising the cultural level, professional competence..
	ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5	GEC 2			LO 3 Knows paradigmatic theories in the history of science, knows the methodology of pedagogy of higher education and the achievements of psychological science, knows how to use knowledge of modern problems of science and education in solving professional problems, applies methods and means of knowledge for intellectual development, raising the cultural level, professional competence.
	ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5	GEC 3			LO 3 Knows paradigmatic theories in the history of science, knows the methodology of pedagogy of higher education and the achievements of psychological science, knows how to use knowledge of modern problems of science and education in solving professional problems, applies methods and means of knowledge for intellectual development, raising the cultural level, professional competence.
	ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5	GEC 4			LO 3 Knows paradigmatic theories in the history of science, knows the methodology of pedagogy of higher education and the achievements of psychological science, knows how to use knowledge of modern problems of science and education in solving professional problems, applies methods and means of knowledge for intellectual development, raising the cultural level, professional competence.
M2	ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 1	LO 1 Applies methods of actuarial mathematics, performs software verification, develops mathematical models of cluster systems, puts into practice modern methodologies for managing the life cycle and quality of systems, software tools and information technology services, is able to formulate requirements for virtual infrastructure, uses programming languages of modern computer mathematics systems, applies a modern mathematical apparatus in effective integration with

					instrumental computer mathematical tools, knows the technology of using cloud technologies
ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 2	ЛО 1 Applies methods of actuarial mathematics, performs software verification, develops mathematical models of cluster systems, puts into practice modern methodologies for managing the life cycle and quality of systems, software tools and information technology services, is able to formulate requirements for virtual infrastructure, uses programming languages of modern computer mathematics systems, applies a modern mathematical apparatus in effective integration with instrumental computer mathematical tools, knows the technology of using cloud technologies	
ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 3	ЛО 1 Applies methods of actuarial mathematics, performs software verification, develops mathematical models of cluster systems, puts into practice modern methodologies for managing the life cycle and quality of systems, software tools and information technology services, is able to formulate requirements for virtual infrastructure, uses programming languages of modern computer mathematics systems, applies a modern mathematical apparatus in effective integration with instrumental computer mathematical tools, knows the technology of using cloud technologies	
ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 4	ЛО 1 Applies methods of actuarial mathematics, performs software verification, develops mathematical models of cluster systems, puts into practice modern methodologies for managing the life cycle and quality of systems, software tools and information technology services, is able to formulate requirements for virtual infrastructure, uses programming languages of modern computer mathematics systems, applies a modern mathematical apparatus in effective integration with instrumental computer mathematical tools, knows the technology of using cloud technologies	
ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 5	ЛО 1 Applies methods of actuarial mathematics, performs software verification, develops mathematical models of cluster systems, puts into practice modern methodologies for managing the life cycle and quality of systems, software tools and information technology services, is able to formulate requirements for virtual infrastructure, uses programming languages of modern computer mathematics systems, applies a modern mathematical apparatus in effective integration with instrumental computer mathematical tools, knows the technology of using cloud technologies	
ДДБ1 ДДБ2			ПС 6	ЛО 1 Applies methods of actuarial mathematics, performs software verification,	

	ДДБ3 ДДБ4 ДДБ5				develops mathematical models of cluster systems, puts into practice modern methodologies for managing the life cycle and quality of systems, software tools and information technology services, is able to formulate requirements for virtual infrastructure, uses programming languages of modern computer mathematics systems, applies a modern mathematical apparatus in effective integration with instrumental computer mathematical tools, knows the technology of using cloud technologies
	ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 7	LO 2 Knows the programs and stages of empirical research, owns modern achievements in the field of information technology, knows methods for determining reliability indicators, has the skills to configure local networks, implement network protocols using software, uses neural networks to solve problems of classification, forecasting and management of objects of professional activity, analyzes modern data streams; can find, extract and structure data; able to solve typical problems using methods of reliability of technical systems and protection of information from unauthorized access
	ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 8	LO 1 Applies methods of actuarial mathematics, performs software verification, develops mathematical models of cluster systems, puts into practice modern methodologies for managing the life cycle and quality of systems, software tools and information technology services, is able to formulate requirements for virtual infrastructure, uses programming languages of modern computer mathematics systems, applies a modern mathematical apparatus in effective integration with instrumental computer mathematical tools, knows the technology of using cloud technologies
	ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 9	LO 1 Applies methods of actuarial mathematics, performs software verification, develops mathematical models of cluster systems, puts into practice modern methodologies for managing the life cycle and quality of systems, software tools and information technology services, is able to formulate requirements for virtual infrastructure, uses programming languages of modern computer mathematics systems, applies a modern mathematical apparatus in effective integration with instrumental computer mathematical tools, knows the technology of using cloud technologies
М3	ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 10	LO 2 Knows the programs and stages of empirical research, owns modern achievements in the field of information technology, knows methods for determining reliability indicators, has the skills to configure local networks, implement network protocols using software, uses neural networks to solve problems of classification, forecasting and management of objects of



					professional activity, analyzes modern data streams; can find, extract and structure data; able to solve typical problems using methods of reliability of technical systems and protection of information from unauthorized access
ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 11	ЛО 1 Applies methods of actuarial mathematics, performs software verification, develops mathematical models of cluster systems, puts into practice modern methodologies for managing the life cycle and quality of systems, software tools and information technology services, is able to formulate requirements for virtual infrastructure, uses programming languages of modern computer mathematics systems, applies a modern mathematical apparatus in effective integration with instrumental computer mathematical tools, knows the technology of using cloud technologies	
ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 12	ЛО 1 Applies methods of actuarial mathematics, performs software verification, develops mathematical models of cluster systems, puts into practice modern methodologies for managing the life cycle and quality of systems, software tools and information technology services, is able to formulate requirements for virtual infrastructure, uses programming languages of modern computer mathematics systems, applies a modern mathematical apparatus in effective integration with instrumental computer mathematical tools, knows the technology of using cloud technologies	
ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 13	ЛО 2 Knows the programs and stages of empirical research, owns modern achievements in the field of information technology, knows methods for determining reliability indicators, has the skills to configure local networks, implement network protocols using software, uses neural networks to solve problems of classification, forecasting and management of objects of professional activity, analyzes modern data streams; can find, extract and structure data; able to solve typical problems using methods of reliability of technical systems and protection of information from unauthorized access	
ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 14	ЛО 2 Knows the programs and stages of empirical research, owns modern achievements in the field of information technology, knows methods for determining reliability indicators, has the skills to configure local networks, implement network protocols using software, uses neural networks to solve problems of classification, forecasting and management of objects of professional activity, analyzes modern data streams; can find, extract and structure data; able to solve typical problems using methods of reliability of technical systems and protection of information from unauthorized access	
ДДБ1			ПС 15	ЛО 2	

ДДБ2 ДДБ3 ДДБ4 ДДБ5				Knows the programs and stages of empirical research, owns modern achievements in the field of information technology, knows methods for determining reliability indicators, has the skills to configure local networks, implement network protocols using software, uses neural networks to solve problems of classification, forecasting and management of objects of professional activity, analyzes modern data streams; can find, extract and structure data; able to solve typical problems using methods of reliability of technical systems and protection of information from unauthorized access
ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 16	LO 1 Applies methods of actuarial mathematics, performs software verification, develops mathematical models of cluster systems, puts into practice modern methodologies for managing the life cycle and quality of systems, software tools and information technology services, is able to formulate requirements for virtual infrastructure, uses programming languages of modern computer mathematics systems, applies a modern mathematical apparatus in effective integration with instrumental computer mathematical tools, knows the technology of using cloud technologies
ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 17	LO 1 Applies methods of actuarial mathematics, performs software verification, develops mathematical models of cluster systems, puts into practice modern methodologies for managing the life cycle and quality of systems, software tools and information technology services, is able to formulate requirements for virtual infrastructure, uses programming languages of modern computer mathematics systems, applies a modern mathematical apparatus in effective integration with instrumental computer mathematical tools, knows the technology of using cloud technologies
ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 18	LO 1 Applies methods of actuarial mathematics, performs software verification, develops mathematical models of cluster systems, puts into practice modern methodologies for managing the life cycle and quality of systems, software tools and information technology services, is able to formulate requirements for virtual infrastructure, uses programming languages of modern computer mathematics systems, applies a modern mathematical apparatus in effective integration with instrumental computer mathematical tools, knows the technology of using cloud technologies
ДДБ1 ДДБ2 ДДБ3 ДДБ4 ДДБ5			ПС 19	LO 1 Applies methods of actuarial mathematics, performs software verification, develops mathematical models of cluster systems, puts into practice modern methodologies for managing the life cycle and quality of systems, software tools and information technology services, is able to formulate requirements for virtual

					infrastructure, uses programming languages of modern computer mathematics systems, applies a modern mathematical apparatus in effective integration with instrumental computer mathematical tools, knows the technology of using cloud technologies
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M1 - Social and cultural knowledge

M 2 - Sciense (by industry) and innovation

M 3 - The module final assessment