THE MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN

Non -profit Limited Company M.Auezov South Kazakhstan University

«APPROVED BY»
Chairman of the Board - Rector
_____
d.h.s.,academician D.P. Kozhamzharova
«_____»_____ 2023 year

EDUCATION PROGRAMME

7M01530 - "Computer science"

Registration number	7M01500001
Code and classification of the field of education	7M01 Pedagogical Sciences
Code and classification of training areas	7M015 Teacher training in natural science subjects
Group of educational programs	M012 Teacher training in mathematics
Typeof EP	new
ISCE level	7
NQF level	2
SQF of education level	7
Language of learning	Kazakh, Russian
Typical duration of study	2 years
Form of study	Scientific and pedagogical
The complexity of the EP, not less	120 credits
Distinctive features of EP	-
University Partner (JEP)	-
University Partner (TDEP)	-
Social Partner (DE)	-

Shymkent, 2023

Drafters:

Name	Position	Sign
Zhaidakbayeva L.K.	c.p.s., Senior Lecturer Head.Department of " Informatics»	
Ydirysbaev D.U.	Master, Senior Lecturer of "Computer Science"	
Nurmukhanbetova G.K.	Director of LLP «KazTilDamu»	
Utegenov M.K.	Director of the Higher College of New Technologies named after M.Utebaev	

The EP was considered in the direction of training Teacher training in natural science subjects at a meeting of the academic committee,
Minutes# ____ «_____»_____ 2023 y.

Chairman of Committee _____ Urazbayev K.M.

The EP was onsidered and recommended for approval at Educational-methodical meeting of M. Auezov SKU.

Minutes# ____ «_____»_____ 2023 y.

Chairman of Educational- methodical meeting _ _____ Abisheva R.

The EP was approved by the decision of the Academic Council of the University
Minutes# ____ «_____»_____ 2023 y.

CONTENT

1 CONCEPT OF THE PROGRAM

University Mission	Generation of new competencies, training of a leader who translates research and entrepreneurial thinking and culture
University Values	• Openness–open to change, innovation and cooperation. • Creativity – generates ideas, develops them and turns them into values. • Academic freedom – free to choose, develop and act. • Partnership – creates trust and support in a relationship where everyone wins. • Social responsibility – ready to fulfill obligations, make decisions and be responsible for their results.
Graduate Model	• Deep subject knowledge, their application and continuous expansion in professional activity. • Information and digital literacy and mobility in rapidly changing conditions. • Research skills, creativity and emotional intelligence. • Entrepreneurship, independence and responsibility for their activities and well-being. • Global and national citizenship, tolerance to cultures and languages.
The uniqueness of the educational program	• Orientation to the regional labor market and social order through the formation of professional competencies of the graduate, adjusted to the requirements of stakeholders • Practical orientation and emphasis on the development of critical thinking and entrepreneurship, the formation of a wide range of skills that will allow to be functionally literate and competitive in any life situation and be in demand in the labor market
Academic Integrity and Ethics Policy	The University has taken measures to maintain academic integrity and academic freedom, protection from any kind of intolerance and discrimination: • Rules of academic integrity (Minutes of the Academic Council No. 3 dated 30.10.2018); • Anti-Corruption Standard (Order No. 373 n/k dated 27.12.2019). • Code of Ethics (Protocol of the Academic Council No. 8 dated 31.01.2020).
Regulatory and legal framework for the development of EP	1. Law of the Republic of Kazakhstan "On Education"; 2. Model rules for the activities of educational organizations implementing educational programs of higher and (or) postgraduate education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 30, 2018 No. 595; 3. State obligatory standards of higher and postgraduate education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 31, 2018 No. 604; 4. Rules for organizing the educational process on credit technology of education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated April 20, 2011 No. 152; 5. Qualification directory of positions of managers, specialists and other employees, approved by order of the Minister of Labor and Social Protection of the Population of the Republic of Kazakhstan dated December 30, 2020 No. 553. 6. Guidelines for the use of ECTS.

	7. Guidelines for the development of educational programs for higher and postgraduate education, Appendix 1 to the order of the Director of the Center for the Bologna Process and Academic Mobility No. 45 o / d dated June 30, 2021
Organization of the educational process	• Implementation of the principles of the Bologna Process • Student-centered learning • Availability • Inclusivity
Quality assurance of the Educational program	• Internal quality assurance system • Involvement of stakeholders in the development of the Educational Program and its evaluation • Systematic monitoring • Actualization of the content (updating)
Requirements for applicants	It is established according to the Model Rules for admission to training in educational organizations, implementing educational programs of higher and postgraduate education, Order of the Ministry of Education and Science of the Republic of Kazakhstan No. 600 dated 31.10.2018
Conditions for the implementation of educational programs (EP) for persons with disabilities and special educational needs(SSN)	For students with SEN (special educational needs) and persons with disabilities (PSI), tactile PVC tiles, specially equipped toilets, a mnemonic diagram, and shower bars have been installed in educational buildings and student dormitories. Special parking spaces have been created. Crawler lift installed. There are desks for people with limited mobility (PLM), signs indicating the direction of movement, ramps. In the educational buildings (main building, building No. 8) there are 2 rooms with six working places adapted for users with disorders of the musculoskeletal system (DMS).For visually impaired users, the SARA™ CE Machine (2 pcs.) is available for scanning and reading books. The library website is adapted for the visually impaired. There is a special NVDA audio program with a service. The JIC website http://lib.ukgu.kz/ is open 24/7. An individual differentiated approach is provided for all types of classes and in the organization of the educational process.

2 PASSPORT of the educational program

Purpose of the EP	Training of competitive, competent masters of pedagogical Sciences of pedagogical direction, who are able to use in their professional activities the knowledge, skills and abilities obtained in the educational process in mathematics and computer science to solve pedagogical problems at all levels of education through information and communication technologies.
Tasks of the EP	- to provide conditions for the development of a high intellectual level of development, the acquisition of logical and critical thinking skills of scientific and organizational work in scientific and pedagogical activities; - development of the ability to use system theoretical and practical knowledge on the methodology of teaching mathematics and computer science in professional activities in solving scientific, managerial and educational tasks and making operational decisions in problem situations; - development of self-service skills to ensure the possibility of rapid employment in the specialty or continuing education in the doctoral program and ensure continuous professional development of professional

	activities; - formation of graduates ' competitiveness in the field of education, training of highly qualified and consistently popular undergraduates in scientific and pedagogical areas for the domestic and international labor market.
Harmonization of EP	• 7th level of the National Qualifications Framework of the Republic of Kazakhstan; • Dublin descriptors of the 7th level of qualification; • 2 cycle of a Framework for Qualification of the European Higher Education Area); • 7 th Level of European Qualification Framework for Life long Learning).
Connection of the EP with the professional sphere	The Sectoral qualifications Framework Education, approved by Protocol No. 2 of the meeting of the sectoral Tripartite Commission on Social Partnership and Regulation of Social and Labor Relations under the Ministry of Education and Science of the Republic of Kazakhstan dated November 23, 2016 Professional standard "Teacher" approved by the order of the Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" No. 133 dated June 8, 2017
List of qualifications and positions	Masters of pedagogical sciences in the specialty «7M01530 - Computer science» should be replaced by the words "teachers and researchers in research institutes, design and engineering organizations, specialists and other employees in accordance with the qualification requirements of the qualification directory of officials" (Republic of Kazakhstan) Approved by the order of the Minister of Education and Science of June 13, 2009 № 338, May 21, 2012 № 201-p-m and "Standard knowledge of the position of training and personnel 241, with the order of December 27, 2013 № 512).
Field of professional activity	Field of professional activity: - higher education; - research in mathematics and computer science; - Research in the field of methods of teaching mathematics and computer science; - Research in the field of information and communication technologies.
Objects of professional activity	Objects of professional activity of graduates: - educational organizations (universities, educational institutions); - state educational bodies; - centers of educational services; - training and research centers; - various forms of ownership that use the methods of mathematics and computer science in their work. - research institutions and centers for informatization of education; - organization of educational systems of various forms of ownership, using computer technology in their work.
Subjects of professional activity	- The system of theoretical knowledge in mathematics and computer science; - Theoretical and methodological bases of scientific research in pedagogy; - Research methodology in the field of mathematical and computer

	education;
	- A system of methods for implementing research results in practical training; - Mechanisms for commercialization of research results; - a system of practical skills for the development of scientific and methodological complexes, author's courses; - system of higher education pedagogy; - systems of educational psychology; - pedagogical management system; - development of educational and methodical materials; - application of norms, rules, forms, methods and tools of international cooperation in the professional sphere; - Methods of teaching mathematics and computer science in secondary and special education institutions; - The system of research of the educational process and its value-oriented orientations, content, methods, forms and results; - Research system in the field of computer science, applied mathematics, pedagogy, psychology and teaching methods; -innovation and information-analytical services; - Technological process of design, implementation and maintenance of software, mathematical, information software.
Types of professional activity	- education; - training; - education; - pedagogical; - innovative; - communicative; - management; - research and development; - social; - organizational.
Learning outcomes	**LO1** Demonstrate knowledge of a foreign language in interpersonal communication, professional activity, writing scientific articles. **LO2** To analyze the main ideological and methodological problems, including interdisciplinary ones, arising in science at the present stage of its development, to evaluate various facts and phenomena based on the provisions and categories of the philosophy of science. **LO3** Use the methodology of pedagogical science, the professional competence of a high school teacher. **LO4** To analyze the methods of theoretical and practical training used in the process of teaching informatics, threats to the information security of objects and countermeasures, aspects of the use of information and communication technologies in education. **LO5** To understand modern trends in education, the features of STEM training for the development of functional literacy of students. **LO6** Develop applications that interact with objects through 3D-based virtual reality. **LO7** To form skills and abilities in creating and programming robots, to have solid skills in software design. **LO8** Analyze the current state of professional training of a future computer science teacher and determine modern requirements for his

	training, apply big data analysis methods in education to improve the efficiency of educational systems management and ensure the quality of education. **LO9** Use innovative technologies in SMART education. **LO10** Work with IT capabilities and big data when solving various problems, select and reasonably use methods and hardware and software information protection tools.

3 COMPETENCES OF THE GRADUATE OF EP

SOFT SKILLS (Behavioral skills and personality qualities)	
SS 1. Competence in managing one's own literacy	SS1.1. Strive for professional and personal growth throughout life. SS 1.2. Constantly update own knowledge within the chosen trajectory and in an interdisciplinary environment, carry out further learning with a high degree of independence and self-regulation. SS 1.3. To be capable of reflection, an objective assessment of one's achievements, an awareness of the need to form new competencies and continue education in doctoral studies.
SS 2. Language competence	SS2.1. The ability of possessing a sufficient level of communication in the professional field in the state, Russian and foreign languages for negotiating and business correspondence. SS 2.2. The ability of mastering the skills of mediation and intercultural understanding.
SS 3. Mathematical Competence and Competence in the field of Science	SS3.1. The ability to interpret the methods of mathematical analysis and modeling for solving applied problems in the field of study. SS3.2. The ability to plan the setting of scientific experiments, integrate and implement the results of scientific research in the professional field. SS 3.3. The ability to analyze and comprehend modern methods of pedagogical and psychological science and apply them in pedagogical activity.
SS 4. Digital competence, technological literacy	SS 4.1. The ability to confidently use modern information and digital technologies, artificial intelligence systems for work, leisure and communications. SS 4.2. Proficiency in the use, recovery, evaluation, storage, production, presentation and exchange of information in a wide range of digital devices. SS 4.3. Ability to confidently use global information resources and apply technological literacy in research and computational and analytical activities.
SS 5. Personal, social and academic competencies	SS 5.1. Possession of the norms of business ethics, social and ethical values and focus on them in professional activities. SS 5.2. Formation of a personality capable of mobility in the modern world, critical thinking and physical self-improvement. SS 5.3. Ability to work in a team, correctly, clearly and reasonably defend one's position during discussions and make decisions of a professional nature. SS 5.4. Ability to adequately navigate in various social spheres of activity and in conditions of uncertainty. SS 5.5. Ability to find compromises, correlate own opinion with the opinion of the team.
SS 6. Entrepreneurial	SS 6.1. The manifestation of leadership qualities and the ability to

competence	have a positive impact on others, to lead a team. SS 6.2. The ability to create conditions for the development of creative and entrepreneurial skills of the team. SS 6.3. The ability to work in a mode of uncertainty and rapidly changing task conditions, make decisions, respond to changing working conditions, allocate resources and manage your time. SS 6.4. Ability to work with consumer needs.
SS 7. Cultural awareness and ability to express yourself	SS7.1. The ability to show worldview, civil and moral positions. SS7.2. The ability to be tolerant of the traditions and culture of the peoples of the world, to have high spiritual qualities.
HARD SKILLS	
PC1 scientific research	PC1.1 The ability to creatively use knowledge of fundamental and applied sections of biology in scientific and technological activities using the latest domestic and foreign experience.
PC2 scientific and innovative	PC2.1 The ability to apply the methodological foundations of design, implementation of field and laboratory, biological, physiological and medical research, use modern equipment, computer systems in accordance with the direction of the master's program.
PC3 organizational and managerial	PC3.1 The ability to plan and carry out activities to assess the state and protection of the environment, to organize activities for the PC3.2 Assessment and restoration of biological resources; PC3.3 To organize scientific seminars and conferences; the ability to use the skills of preparation and design of scientific and technical documentation, scientific reports, reports and articles.
PC4 pedagogical and educational	PC4.1 The ability to methodically competently make plans for lectures and practical training in the sections of academic disciplines and publicly present the theoretical and practical sections of academic disciplines in accordance with the approved teaching AIDS; PC4.2 To possess the skills and abilities of designing and implementing a holistic pedagogical process, to be able to positive thinking, attached to the system of national values, committed to ethical values, prone to humanism and optimism.
PC5 innovation and design	PC5.1. The ability to use innovative solutions in the development of new technologies, the ability to assess innovative business risks in the implementation of new solutions in the field of technology development for various fields of activity; PC5.2. The ability to develop plans and programs for the organization of innovative activities of research teams.

3.1 Matrix mapping of learning outcomes at the EP in general, generated by the competence modules

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10
SS1	+	+		+			+		+	
SS2		+	+	+	+	+		+	+	
SS3	+		+	+	+	+	+			
SS4		+	+				+	+	+	+

SS5		+	+	+			+	+	+	+
SS6		+	+	+		+				
SS7	+		+	+		+				
PC 1		+		+			+			
PC 2	+	+			+	+		+		
PC 3			+	+		+	+		+	
PC 4				+	+			+		+
PC 5	+				+		+		+	+

4 Matrix of the influence of disciplines on the formation of learning outcomes and information on labor intensity

Module name	ЦИ КЛ	ВК/К В	Component Name	Brief course description (in 30-50 word)	Number of credits	Formed PO (codes)									
						RO1	RO2	RO3	RO4	RO5	RO6	RO7	RO8	RO9	RO10
	BD	UC	Foreign Language (Professional)	The aim is to increase the initial level of foreign language proficiency achieved at the previous stage of education, and to master the necessary and sufficient level of communicative competence Content: skills in preparing written reports on scientific topics in the specialty; scientific report, theses on the topic of scientific text, summary. General content of authentic records. Listening to lectures, messages containing professional information. Oral communication skills in the specialty: presentation of a scientific report, presentation of a scientific research, scientific discussion, scientific debate, situational games.	4	✓	✓								
	BD	UC	History and Philosophy of Science	Purpose: Study of the problems of the phenomenon of science as a subject of special philosophical analysis, patterns and trends in the development of special	4	✓	✓								

					activities for the production of scientific knowledge taken in a socio-cultural context. Identification of the specifics and relationship of the main problems of history and philosophy of science. Study of the laws of the development of science and the structure of scientific knowledge, methods of scientific research. Knowledge of the main concepts and directions of the non-classical and post-classical stage of the development of science. Analysis of the realities of modern theory and practice based on understanding the methodology of natural science, socio-humanitarian and technical knowledge. Critical thinking as a prerequisite for the development and functioning of modern society. Technologies for the development of critical thinking: consideration and study of the logic of arguments. Formation of critical reflexive thinking and metacognitive abilities.																
	BD	UC	Higher School Pedagogy	The aim is to consider modern paradigms of higher education, the system of higher professional education in Kazakhstan. Content: modern paradigms of education, history and latest trends in the development of higher professional education in the world and in Kazakhstan. Genesis and	4	✓	✓													

					activities for the production of scientific knowledge taken in a socio-cultural context. Identification of the specifics and relationship of the main problems of history and philosophy of science. Study of the laws of the development of science and the structure of scientific knowledge, methods of scientific research. Knowledge of the main concepts and directions of the non-classical and post-classical stage of the development of science. Analysis of the realities of modern theory and practice based on understanding the methodology of natural science, socio-humanitarian and technical knowledge. Critical thinking as a prerequisite for the development and functioning of modern society. Technologies for the development of critical thinking: consideration and study of the logic of arguments. Formation of critical reflexive thinking and metacognitive abilities.																
	BD	UC	Higher School Pedagogy	The aim is to consider modern paradigms of higher education, the system of higher professional education in Kazakhstan. Content: modern paradigms of education, history and latest trends in the development of higher professional education in the world and in Kazakhstan. Genesis and	4	✓	✓													

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				methodology of pedagogy of higher education, the competence of a university teacher. Problems of university didactics, problems of organizing educational work with students, management of a modern university. Modern approaches and methods of teaching and organization of educational activities of students, evaluation of educational achievements.																
	BD	UC	Psychology of Management	Purpose: To ensure the competence of a psychologist by mastering his knowledge in the field of psychological management, the development of human resource management skills of the organization. Contents: Methodological foundations of management psychology. Development of psychological management theories. General theoretical issues of management psychology. Psychology of managerial communication. Psychological characteristics of the staff. Psychology of employee motivation. Human resource management technologies of the organization. Psychological support of the personnel policy of the organization. Psychology of conflict in the organization. Technologies for preventing professional deformation of the personality. Practical	4	✓	✓												

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			implementation in the form of creation of diagnostic tools, development of digital methods of training managers, management consulting.														
BD	EC	Introduction to STEM	Purpose: through integral training, teaches people technical creativity, critical thinking, teamwork, and attitude to work with interest and responsibility Content: International and Kazakhstan experience in the introduction of STEM education. Relevance, purpose and objectives of STEM education. Experience of foreign countries in the field of STEM education. Introduction and development of STEM education in Kazakhstan. Principles of preparation of curricula and organization of training in STEM education. Methodological recommendations for the introduction of STEM education.	5			✓	✓	✓								
BD	EC	Innovation	Objective: to study the patterns of the innovation process, the peculiarities of the transformation of scientific achievements into innovations and innovation management. Content: Introduction to the subject.The main features of innovation.Theories of innovation The basic concepts of innovation activity. Classification of innovations. The structure of the innovation process. R&D and protection. intellectual property.	5			✓	✓	✓								

	BD	EC	Methods and technologies of STEM education	Purpose: through integral training, teaches people technical creativity, critical thinking, teamwork, and attitude to work with interest and responsibility Content:. The course is aimed at studying the content, teaching methods, technologies and didactic tools of STEM education. Undergraduates acquire the ability to analyze, systematize, generalize and describe the experience of implementing the STEM approach, acquire creative abilities for the original solution of interdisciplinary problems, master the basics of designing STEM classes to achieve educational goals	6				✓	✓	✓	✓			
				Priorities of innovative development.											
	BD	EC	Methods of Teaching Educational Robotics	Purpose: formation of readiness for the organization of effective scientific, informational and methodological support for the introduction of robotics in education Content:. The course is aimed at mastering the basics of robotics and the formation of knowledge, skills, skills and competencies necessary for the use of robotic designers in the educational process. Undergraduates develop logical and creative thinking, develop the ability to design and program robots of varying degrees of complexity.	6				✓	✓	✓	✓			

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				Undergraduates master the methods and technologies of developing technical creativity projects														
✓	BD	EC	Organization of Educational and Research Work on Methods of Teaching Informatics	Purpose: formation of undergraduates' knowledge about the education system in the field of computer science, methods of designing the learning process of different categories of students in computer science, as well as the main components of the professional activity of a teacher and examples of its implementation.. Content: To organize the research activities of masters from the perspective of the stages of the educational and research project; to form the ability of undergraduates to independently determine their readiness to perceive a new structural unit of the educational process, to track the growth of professional and personal qualities throughout the course.	5			✓	✓					✓	
✓	BD	EC	Planning and Organization of Scientific Research	Purpose: the purpose of this discipline is to train highly qualified specialists who have the skills to use modern information technologies in the professional field. Content: Correct design and appropriate evaluation of educational software. Undergraduates write programs using established design methods and procedures. Covers crash protection programs, user help menu	5			✓	✓					✓	

			methods, documentation methods, and screen formatting															
	BD	EC	Principes of Virtual and augmented reality	Purpose: formation of knowledge and skills of students in the field of digital technologies and in the field of application of virtual and augmented reality. Contents: Fundamentals of virtual and augmented reality technologies. Visualization and interaction devices for immersive environments. Development of augmented reality applications. Development of virtual reality applications. Development of high performance virtual and augmented reality applications	5							✓				✓	✓
	BD	EC	SMART education	Purpose: to show that the use of modern teaching methods provides fundamentally new opportunities in educational activities. Content:SMART learning is implemented using technological innovations and the Internet, which provides students with the opportunity to acquire professional competencies based on a systematic multidimensional vision and study disciplines taking into account their multidimensional nature and continuous updating of content. Smart technologies make it possible to develop revolutionary teaching materials, as well as to form individual learning	5							✓				✓	✓

				trajectories for students.															
	PD	UC	Teaching Methods of Special Disciplines	The aim is to prepare competent, motivated for knowledge and creativity, learning and self-learning specialists capable of analyzing a wide range of modern innovative technologies, areas in the process of teaching specialized disciplines. Content: competency-based approach in education, technologies of individual, integrated and multimedia learning. Training in teaching specialized disciplines by analyzing and solving problem situations, drawing up a group project, conducting a role-playing game; organization of the educational process on distance educational technologies. Methodological features of the study of specialized disciplines, development and updating of educational and methodological documentation.	5		✓	✓										
	PD	EC	Data Analysis	Purpose: Formation of skills in the application of computer-based methods for solving problems of data analysis and interpretation in the development of algorithms for analysis and processing of measurement information. Acquisition of practical skills of working with modern application software packages for solving problems of data analysis and interpretation. Content: Introduction to data analysis.	4											✓		✓

				The problem of data processing. The data matrix. Classification of data using deterministic models. Classification of data based on statistical models. Cluster analysis. Methods for reducing data dimensions. DATA MINING systems in data analysis and interpretation tasks. Modern application software packages for solving experimental data processing problems.														
✓	PD	EC	Information Security and Protection in Information Systems	Purpose: to study the theoretical foundations and methods of information protection by undergraduates, the mathematical structure of secret systems, to consider the mathematical representation of information, methods of analysis of information characteristics and redundancy of language systems, the theoretical foundations of Correction and restoration of information characteristics of arbitrary texts, to create information protection systems, to master the basic methods and means of Information Protection. Content: Information Protection. Information security. Analysis of the software and hardware platform of Information Systems. Security models of Information Systems. Examples of practical implementation of Defense and security systems. The main	6										✓		✓

				characteristics of a protected information system. Methodology for the correctness of Information Protection. Information protection measure. Optimal management of Defense processes. Assessment of the defense system. Security of computer systems.														
	PD	EC	Big Data	Purpose: mastering theoretical and practical knowledge by undergraduates and acquiring skills and abilities in the field of using modern information technologies and software tools, in solving problems of professional activity, based on available resources and constraints, which will allow you to more effectively manage your time Contents: Big data (Big Data): modern approaches to processing and storage. Technical difficulties of working with big data. The role of big data in solving analytical and research problems of professional activity.	6											✔		✔
	PD	EC	Data Protection in Computer Networks	Purpose: to provide students with knowledge of the main types and methods of information protection; students acquire the ability to design information protection systems; mastering modern software and hardware means of information protection. Content: General issues of information security. State information	6											✔		✔

					security system. Security threats. Theoretical foundations of information systems protection methods. Methods of protection of computer equipment. Fundamentals of cryptography. Architecture of protected economic systems. Algorithms for binding software to the hardware environment. Security algorithms in computer networks.																
	PD	EC		Innovative Processes in Education	Purpose: formation of a system of general cultural and professional pedagogical competencies among undergraduates in the development of knowledge and methods of activity related to innovative processes in education in the light of modern educational reforms, preparation of undergraduates for practical pedagogical and managerial activities in secondary schools, formation of a theoretical knowledge base for the formation of a school educational system based on modern management documents and theoretical pedagogical achievements. Content: Innovative processes as a phenomenon of modern education. Innovative processes in education management. Innovative educational processes in secondary schools. Innovative processes in professional pedagogical education	4											✓	✓	✓

	✔	PD	EC	Informatization of Education and Learning Problems	Purpose: to master the direction of using information technologies in teaching and education management, methods of using information technologies in teaching Content: Computer science and education. Informatization of education as a direction of scientific research and training of teaching staff. Technical base and basic basic means of informatization of education. Informational educational environment. The possibilities of information technology in education.	4											✔	✔	✔
	✔	PD	EC	Methodical System of Teaching	To design the educational process in computer science with the use of modern technologies corresponding to the General and specific patterns and characteristics of age development of the individual; to design elective courses in computer science using the latest achievements of science.	6											✔	✔	✔
	✔	PD	EC	Methodological training of teacher of informatics in High School	Purpose: formation of knowledge among undergraduates about the education system in the field of informatics, methods for designing the learning process for different categories of students in informatics, as well as the main components of a teacher's professional activity and examples of its implementation. Content: Analyze the current state of the professional preparation of a future computer science	6											✔	✔	✔

				teacher and determine the modern requirements for his training; Distinguish the possibilities of international educational clusters as an innovative model of the globalization of the educational process in the context of informatization and mass communication;														
		PD	EC	Scientific and pedagogical foundations of information modeling	Objective: master's students master the methodology and technology of modeling (primarily computer modeling) in the research, design and operation of information systems. Content: To solve typical professional and methodological tasks of a computer science teacher at the basic profile and advanced levels; to create electronic textbooks on computer science; to apply various methods of monitoring and evaluating students' knowledge; to create and apply interesting learning tasks in computer science lessons	5						✔		✔	✔	✔
		PD	EC	Scientific and pedagogical basic of computer modeling	Purpose: to study a computer mathematical model to reveal the wide possibilities of computer science in understanding the connection between mathematics, natural science and social science. Content: Analyze the basic concepts of modeling, classification of models, model life cycle and basic operations on models, analysis, interpretation and visualization of	5						✔		✔	✔	✔

				simulation results, simulation modeling and planning of a computer experiment, programs and systems of computer simulation													
	PD	EC	Educational software Evaluation and design	Purpose: Formation of the ability to organize the software development process, project management, software design, software testing process and master the methodology of testing software systems. Contents: Overview of modern software development technologies. Organization of the software development process. Project management process. Planning of project tasks. Software project sensitivity analysis. Methods of analysis focused on data structures. Fundamentals of designing software systems. Features of the process of synthesis of software systems. Module connection.	5							✔	✔			
	PD	EC	Pedagogical Informatics	Purpose: methodological training of future computer science teachers – undergraduates for professional activities at school in the context of informatization of Education. Content: methodology of teaching computer science as a pedagogical science. Methodological system for teaching computer science in high school. The structure and content of teaching computer science in high school.	6		✔	✔								

				Current content of the school computer science course. School educational standard in Computer Science. Requirements for the training of a modern computer science teacher. Organization of teaching computer science at school. Differentiated teaching of computer science at the high school level. The main forms of Organization of teaching computer science in high school are considered. Methods and receivers of the formation of system-scientific concepts in computer science lessons and in extracurricular time. Organization of verification and evaluation of training results. Methodology for the study of content networks of Information Presentation and Information Processes. Methodology for studying the content algorithmic line.													
	PD	EC	Development and Use of Educational Electronic Publications and Internet Resources	Purpose: to train a methodically competent specialist, to study new knowledge related to the acquisition of skills in the use of information and communication technologies in education. Content: Features and needs of the modern stage of informatization of education. Informatization tools used in education. The essence and specificity of educational electronic publications and resources. Types and	5			✓									✓

				classification of educational electronic publications and resources. Information technologies used in the creation and use of educational electronic publications and resources The main stages and techniques of creating educational electronic publications. Selection of content and formation of methodically expedient navigation on the content of educational electronic publications and resources. Fundamentals of building subsystems for measuring the effectiveness of training Fundamentals of technology of approbation and examination of educational electronic publications and Internet resources. The main stages and techniques of creating educational resources for publication on the Internet. Positive and negative aspects of the use of electronic publications and resources in education. Features of the use of educational electronic publications and resources at different levels of education. Methodological techniques for carrying out educational activities using educational electronic publications and resources, Internet sites and portals. The use of educational electronic resources for measuring and monitoring learning outcomes.																	
	PD	EC		Digital	Purpose: formation of competencies in	6				✓										✓

				teacher	the field of digital educational technologies as the basis for professional training and readiness to use them in professional activities. Content: Digital education: the world of artificial intelligence, global and domestic development trends. Digital education: global and domestic development trends.												

5 A SUMMARY TABLE SHOWING THE VOLUME OF CREDITS IN THE CONTEXT OF THE MODULES OF THE EDUCATIONAL PROGRAMME

Training course	Semester	Number of modules to be mastered	Number of subjects studied			Number of subjects studied					Total hours	Total credits KZ	Number	
			GC	VC	EC	Theoretical training	Pedagogical practice	Research. practice	Research work of a master's degree student	Final certification			exam	differentiated credit
1	1	5		5	2	29		-	1	-	900	30	6	2
	2	5		1	4	23	4		3	-	900	30	4	2
2	3	4			3	21		7	2	-	900	30	3	2
	4	1			0	0		-	18	12	900	30		1
total				6	9	73	4	7	24	12	3600	120	13	7

6 LEARNING STRATEGIES AND METHODS, MONITORING AND EVALUATION

Learning strategies	Studentcentred Approach in Education: learner – teaching center / learning and an active participant in the learning and decision-making process. Practice-oriented training: orientation to the development of practical skills.

Teaching methods	Conducting lectures, seminars, various types of practices:
	• using innovative technologies:
	  problem-based learning;
	  case study;
	  work in a group and creative groups;
	  discussions and dialogues, intellectual games;
	  reflection methods,
	  Bloom's taxonomies;
	  presentations;
	• rational and creative use of information sources:
	  multimedia training programs;
	  electronic textbooks;
	  digital resources.
	Organization of independent work of undergraduates, individual consultations.

Monitoring and evaluation of the achievability of learning outcomes	Current control on each topic of the discipline, control of knowledge in classroom and extracurricular classes (according to syllabus). Assessment forms: • survey in the classroom; • testing on the topics of the discipline; • control works; • protection of independent work; • discussions;

	• trainings; • colloquiums; • abstract, etc . Boundary control at least twice during one academic period within the framework of one academic discipline. Intermediate certification is carried out in accordance with the working curriculum, academic calendar. Forms of conducting: • exam in the form of testing; • oral examination; • written exam; • combined exam; • project protection; • protection of practice reports. Final state certification.

7 EDUCATIONAL AND RESOURCE SUPPORT OF THE EP

Educational Information Center	The structure of the Educational Information Center includes 6 subscriptions, 16 reading rooms, 2 electronic resource centers (ERC). The basis of the network infrastructure of the Educational and Information Center is 180 computers with Internet access, 110 workstations, 6 interactive whiteboards, 2 video doubles, 1 video conferencing system, 3 A-4 format scanners, JIC software - AIBS "IRBIS-64" under MS Windows (basic set of 6 modules), stand-alone server for uninterrupted operation in the IRBIS system. The library fund is reflected in the electronic catalog available to users on the site http://lib.ukgu.kz on-line 24 hours 7 days a week. Thematic databases of their own generation: "Almamater", "Proceedings of SKSU scientists", "Electronic archive" have been created. Online access from any device 24/7 via the external link http://articles.ukgu.kz/ru/pps. Catalogs are processed electronically. EC consists of 9 databases: "Books", "Articles", "Periodicals", "Proceedings of the teaching staff of SKSU", "Rare Books", "Electronic Fund", "SKGU in Print", "Readers" and "SKU". The EIC provides its users with 3 options for accessing its own electronic information resources: from the "Electronic Catalog" terminals in the catalog hall and in the EIC subdivisions; through the information network of the university for faculties and departments; remotely on the library website http://lib.ukgu.kz/. Open access to international and republican resources: "SpringerLink", "Polpred", "Web of Science", "EBSCO", "Epigraph", to electronic versions of scientific journals in the public domain, "Zan", "RMEB", "Adebiet", Digital library "Aknurpress", "Smart-kitar", "Kitar.кz", etc. For people with special needs and disabilities, the library website has been adapted to the work of visually impaired users
Material and technical base	The material and technical base of the Department of Informatics includes the following classrooms and computer classes: - there are 3 computer classes for laboratory work, one of them with an interactive whiteboard;

	- lecture halls; - STEM center. Practice bases for undergraduates: 1. South Kazakhstan State Pedagogical University. 2. M.Utebayev Higher College of New Technologies 3.KazTilDamu LLP

AGREEMENT SHEET

by Education Program code 7M01530 - «Computer science»

Director of Department
on the Academic Questions _____ A. Naukenova

Director of the Department
of Academy of Science   _____U.B. Nazarbek

Director of Department of
Entrepreneurship and Commercialization _____T.S. Bazhirov

REVIEW

on the educational program
«7M01530 - Computer Science»
developed in M. Auezov SKU, Shymkent

1. Brief description of the enterprise and its business profile

RSE M. Auezov South Kazakhstan University is a leading multidisciplinary university in the Turkestan region. In the structure of the university there is a Natural Science and Pedagogical Higher School, on the basis of which the proposed EP is supposed to be implemented. The department "Computer science" is determined responsible for the implementation of EP.

2. The relevance and demand for EP

Training of specialists in the educational program «7M01530-Computer Science» is very relevant from the point of view of further development of the field of information and communication technologies within the framework of the program "Digital Kazakhstan". Applying theoretical knowledge in solving mathematical and computer applied problems and professional activities, competently solving professional problems using modern computer systems, successfully carrying out scientific and pedagogical activities using effective teaching methods. Conducts monitoring to improve knowledge in the field of applied mathematics, mathematical modeling and system programming, mathematical economics, mathematics, will conduct research on mathematical modeling and computer technology.

3. Learning outcomes and competencies, their relationship with the demands of the labor market

The learning outcomes and competencies embedded in the OP, the theoretical knowledge, practical skills and professional skills provided fully meet the modern qualification requirements for specialized specialists of the master's qualification.

4. Availability of components that develop practical skills

Academic disciplines of educational program of basic and specialized training provide the formation of the necessary practical skills of a specialist with fundamental knowledge in mathematics, possessing computer methods of collecting, storing and processing information used in his professional activities, able to assess the perspectivity of the methods used to solve tasks, competitive in the domestic and international labor markets.

5. The Contents: of the educational program (modules, disciplines)

The proposed educational program contains all the necessary elements for the effective organization of the educational process – regulates the goals, expected results, content, conditions and technologies for the implementation of the educational process, assessment of the quality of training a specialist with a master's degree. It includes a curriculum, work programs of training courses, modules and disciplines, related materials: programs of pedagogical, research practice, academic calendar, educational and methodological complexes of disciplines.

The content of the curriculum fully corresponds to the direction of training specialists, is thought out and competently equipped with content. The academic disciplines included in the plan cover the entire range of topical issues and problems in the field of training, are fully capable of forming the necessary specialized knowledge, skills and abilities in the field of information technology.

The distribution of disciplines by academic periods is rationally and logically verified. All types of educational activities are provided for the preparation of highly qualified specialists with the skills of research work - theoretical training, pedagogical and research practice, writing and defending a dissertation. The planned volume and time resource for academic disciplines and types of training meet the qualification requirements for the level of graduates.

In accordance with the credit technology of education, the curriculum includes mandatory academic disciplines, as well as disciplines of the university component and an optional component. Compulsory disciplines provide the formation of general and professional competencies. The disciplines of the university component and the component of choice expand and deepen the training of students, contribute to obtaining additional competencies, knowledge and skills necessary to ensure the graduate's competitiveness with the requirements of the labor market.

6. The quality of filling information about the disciplines

The composition of educational modules covers all relevant areas of training specialists in the field of information technology. The Contents: of the table "Information about disciplines" of the educational program includes the following information: module name, cycle, type of discipline, name of the discipline and its brief description, number of credits, codes of learning outcomes, and also correspond to the adopted competence model of the graduate.

7. Conclusion on the EP

Based on the above, we can say that the goals and content of the proposed educational program meet the modern qualification requirements for the preparation of masters specializing in education under the educational program "7M01530-Computer Science".

Director of «KaztilDamu» LLP   G.K. Nurmukhanbetova

Expert conclusion

on the educational program
«7M01530- Computer Science»

1. The relevance of the EP

Currently, students in the field of teacher training in natural sciences apply mathematical knowledge and information literacy at all levels of education, in research institutes, state and non-state scientific and educational institutions. Because the effective use of modern software products, technical means and technologies in the professional sphere is a requirement of modernity. The student analyzes and applies information from various sources of information on issues arising in the course of his activities, carries out professional activities in compliance with the rules of information security, applies information and communication technologies in conducting mathematical research.

2. Compliance of EP with formulated objectives, consistent with the mission of the university, the needs of employers and students

The educational program "7M01534 -"Mathematics-Informatics" formulates the concept of the educational program, the goals and objectives of training specialists, requirements for the organization of the educational process and for applicants, the results of training in the OP, and also contains a description of the qualification characteristics of the graduate of the educational program, his key and professional competencies, information about disciplines. The list of academic subjects and their content meet the modern qualification requirements for specialists in the field of information technology and mathematics and computer science.

The requirements for the selection of academic disciplines, formed knowledge, practical skills and professional competencies are fully consistent with the mission of the university "aimed at the formation of new competencies, training of a leader who spreads research thinking and culture", meets the needs of employers and undergraduates.

3. Compliance with the National Framework of Qualifications of the Republic of Kazakhstan

The objectives and Contents: of the EP correspond to level 7 of the National Qualifications Framework of the Republic of Kazakhstan.

4. Reflection in the OP of learning outcomes and competencies based on Dublin descriptors laid down in professional standards / industry framework

The OP is harmonized with the Dublin descriptors, the 2st cycle of the Qualifications Framework for the European Higher Education Area (A Framework for the European Higher Edication Area), and also the 7th level of the European Qualifications Framework for Lifelong Learning.

5. Compliance with the classification of training areas with higher education

The educational program corresponds to the direction 7M015 Training of teachers in natural science subjects of the classifier of training areas with higher education.

6. The structure and Contents: of the EP, the application of the modular principle of their construction

In accordance with the credit technology of education in the EP, a modular construction principle is laid. The curriculum includes disciplines of the university component and disciplines of the component of choice. The disciplines of the university component ensure the formation of general and professional competencies. Elective component disciplines broaden and deepen the training of students, contribute to obtaining additional competencies, knowledge and skills necessary to ensure the graduates' competitiveness with the requirements of the labor market.

The composition of educational modules covers all relevant areas of training highly qualified specialists in the field of information technologies that are competitive in the domestic and international labor markets.

7. The presence in the OP of components to prepare for professional activities, developing key competencies, intellectual and academic skills, reflecting the changing requirements of society, including the implementation of the presidential program for mastering three languages: Kazakh, Russian and English.

The Contents: of the EP corresponds to the focus of training, thought out and well-equipped with meaningful Contents: . The included academic disciplines cover the whole range of topical issues and problems and problems according to the profile of training, are fully able to form the necessary specialized knowledge, skills and abilities of information technologies, suggest mastering Kazakh, Russian and English languages.

8. The logical sequence of disciplines and the reflection of the basic requirements in the curricula and training programs

The distribution of disciplines by academic periods is rationally and logically verified. All types of educational activities are provided for the preparation of highly qualified specialists with the skills of research work - theoretical training, pedagogical and research practice, writing and defending a dissertation. The planned volume and time resource for academic disciplines and types of training meet the qualification requirements for the level of graduates.

The structural parts of the educational program are interrelated, continuous, aimed at achieving the planned comprehensive result and are disclosed in depth and in full.

Methodological equipment of the educational program contributes to the successful solution of tasks in key areas of training, education and development of undergraduates.

9. Reflection in the EP of the system of accounting of the academic load of students and teachers in loans, its compliance with the parameters of the credit system of education.

The content of the OP fully complies with the requirements of the credit technology of education, including in terms of accounting for the academic load of teachers and undergraduates in loans. 120 credits are provided.

10. Presence in programs of industrial practice for fixing the theoretical material expressed in the academic load in credits

The educational program provides for the following types of practices: pedagogical practice in the amount of 4 credits, research in the amount of 6 credits.

There are 24 credits for master's research work, including internship and dissertation, 8 credits for the design and defense of a master's thesis.

11. Qualifications obtained as a result of the mastering of EP

Upon mastering the OP, it is planned to assign the graduate the qualification of Master of Pedagogical Sciences according to the educational program "7M01530 Computer Science".

12. Recommendations

In accordance with the above, it seems possible to assert that the goals and content of the OP meet the modern requirements for the preparation of masters specializing in mathematics and computer science.

It is recommended to accept the presented educational program for implementation.

Expert,
Candidate of Physical and Mathematical Sciences,
Associate Professor of the Department of Physics
of the M.Auezov South Kazakhstan University _____ Oralbaev A.B.