

MINISTRY OF SCIENCES AND HIGHER EDUCATION OF THE REPUBLIC OF
KAZAKHSTAN
M.O. AUEZOV SOUTH KAZAKHSTAN UNIVERSITY

«APPROVED»

Chairman of the board -

Rector _____

Doctor of historical sciences,

Academician, Kozhamzharova D.P.

«__»_____2022

EDUCATIONAL PROGRAM

7M06120 - "Information Systems"

Registration number	7M06100006
Code and classification of the field of education	7M06 Information and Communication Technologies
Code and classification of areas of training	7M061 Information and Communication Technologies
Group of educational programs	M094 Information technologies
Type of EP	acting
ISCE level	7
NQF level	7
IQF level	7
Language of instruction	Kazakh, Russian, English
The complexity of the EP	120 credits
Distinctive features of the EP	-
Partner university (JEP)	-
Partner university (DDEP)	-

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The EP was considered in the direction of training «Information and Communication technology» at a meeting of the academic committee, protocol № ____ «____» _____ 2022 y.

Chairman of the Committee _____ Shertayev E. T.

The EP was considered and recommended for approval at Educational-methodical meeting of M. Auezov SKU
Protocol № ____ « ____ » _____ 2022 y.

The EP was approved by the decision of the Academic Council of the University
Protocol № ____ « ____ » _____ 2022 y.

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1. CONCEPT OF THE EP

University mission	Generation of new competencies, preparation of a leader who translates research and entrepreneurial thinking and culture
University values	<ul style="list-style-type: none"> • 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 – builds trust and support in relationships where everyone wins. • Social responsibility - ready to fulfill obligations, make decisions and be responsible for their results.
Graduate Model	<ul style="list-style-type: none"> • Deep subject knowledge, its application and constant expansion in professional activity. • Information and digital literacy and mobility in a rapidly changing environment. • Research skills, creativity and emotional intelligence. • Entrepreneurship, independence and responsibility for their activities and well-being. • Global and national citizenship, tolerance for cultures and languages.
Uniqueness of EP	<ul style="list-style-type: none"> • Orientation to the regional labor market and social order through the formation of professional competencies of the graduate, adjusted to the requirements of stakeholders. • Practice orientation and emphasis on the development of critical thinking and entrepreneurship, the formation of a wide range of skills that will allow you to be functionally literate and competitive in any life situation and be in demand in the labor market.
Academic Integrity and Ethics Policy	<p>The university has taken measures to maintain academic honesty and academic freedom, protection from any kind of intolerance and discrimination:</p> <ul style="list-style-type: none"> • Rules of academic integrity (protocol of the Academic Council No. 3 dated October 30, 2018); • Anti-corruption standard (Order No. 373 n/k dated December 27, 2019). • Code of Ethics (Protocol of the Academic Council No. 8 dated January 31, 2020).
Legal framework for the development of EP	<ol style="list-style-type: none"> 1. Law of the Republic of Kazakhstan "On Education"; 2. Standard rules of activity 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 with amendments and additions dated December 29, 2021 No. 614 3. State obligatory standards of higher and postgraduate education, approved by order of the Ministry of sciences and higher education of the republic of Kazakhstan dated July 20.2022 No. 2; 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

	<p>dated December 30, 2020 No. 553.</p> <p>6. Guidelines for the use of ECTS.</p> <p>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</p>
Organization of the educational process	<ul style="list-style-type: none"> • Implementation of the principles of the Bologna Process • Student-centered learning • Availability • Inclusiveness
EP quality assurance	<ul style="list-style-type: none"> • Internal quality assurance system • Involvement of stakeholders in the development of the EP and its evaluation • Systematic monitoring • Updating content (updating)
Entry requirements	<p>Established in accordance with the Model Rules for Admission to Education 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 of 10/31/2018</p>

2. EP PASSPORT

Purpose of the EP	To train highly qualified, multilingual and competitive specialists in the field of information systems and technologies with research and teaching skills; possessing advanced knowledge in the field of IT-technologies.
EP tasks	<ul style="list-style-type: none"> - formation of socially responsible behavior in society, understanding the importance of professional ethical standards and following these standards; - providing lifelong learning skills that will enable them to successfully adapt to changing conditions throughout their professional career; - formation of the competitiveness of graduates in the field of information technology, to ensure the possibility of their fastest possible employment in their specialty or continuing education at subsequent levels of education; - providing undergraduates with a solid foundation in the field of computer science, information technology, operation of telecommunications equipment, equipment of local area networks, servers and personal computers, design of computer and telecommunications networks, ensuring their protection and reliability of information transmission, according to the principles of building Web models on the Internet; which will allow them to successfully continue their studies in the chosen field or other relevant areas; - providing undergraduates with lifelong learning skills that will enable them to successfully adapt to changing technologies throughout their professional career.
EP harmonization	<ul style="list-style-type: none"> • Level 7 of the National Qualifications Framework of the Republic of Kazakhstan; • Dublin descriptors of the 7th level of qualification; • 2 cycle of the Qualification Framework of the European Higher Education Area (A Framework for Qualification of the European Higher Education Area); • Level 7 of the European Qualification Framework for Lifelong Learning (The European Qualification Framework for Life long Learning).
Communication of the EP with the professional sphere	<p>Professional standard "Software maintenance" (Appendix No. 29 to the Order of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" dated December 24, 2019 No. 259).</p> <p>Professional standard "Creation and management of information technologies" (Appendix No. 40 to the order of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" dated December 24, 2019 No. 259).</p> <p>Professional standard "Development of artificial intelligence applications", approved by Order No. 259 dated December 24, 2019 of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" (Appendix No. 35);</p> <p>Professional standard "Database Designers and Administrators", approved by Order No. 171 dated July 17, 2017 of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" (Appendix No. 3);</p> <p>Professional standard "Software developers and testing specialists, WEB and multimedia applications", approved by Order No. 171 dated July 17, 2017 of the Deputy Chairman of the Board of the National Chamber of</p>

	<p>Entrepreneurs of the Republic of Kazakhstan "Atameken" (Appendix No. 2);</p> <p>Professional standard "Business Analytics and IT Project Management" (Appendix No. 5 to the Order of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" dated December 24, 2019 No. 259).</p> <p>Professional standard "Network, system administrators and server administrators" (approved by NCE RK "Atameken" - Order No. 330 dated December 5, 2018).</p> <p>Professional standard "Teacher" (Appendix to 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).</p>
Name of the degree awarded	After the successful completion of this EP, the graduate is awarded the degree of "Master of Engineering" in EP 7M06120 "Information Systems"
List of qualifications and positions	<p>Graduates can hold the positions of a big data specialist (NCZ code 2521-1-003); information systems administrator (2523-0-002); IT auditor (2519-1-001); specialist in the creation and management of information resources (content manager) (2529-0-003); project manager in the field of information technology or his assistant (2529-0-004); system analyst (2511-1-002); an artificial intelligence specialist (2519-9-003) in research institutions, design and design organizations without presenting work experience requirements in accordance with the qualification requirements of the National Classifier of the Republic of Kazakhstan (NCZ), approved by the Order of the Committee for Technical Regulation and Metrology of the Ministry of Investment and Development of the Republic of Kazakhstan dated May 11, 2017 No. 130.</p>
Sphere of professional activity	The field of information and communication technologies in the real sector of the economy, management and business, education, dealing with the search, storage, transmission, processing and protection of information.
Objects of professional activity	Information services of research institutions; public administration bodies; design organizations; industrial enterprises; business structures; educational and scientific institutions; standards and profiles of computer systems; means of administration of system and network resources, security management of information resources; innovative projects for the creation and use of information systems.
Subjects of professional activity	<ul style="list-style-type: none"> - mathematical, informational, software, linguistic, technical, organizational and legal support of information systems, including technologies of design, development, implementation, maintenance and their operation; - software for computer visualization of science and technology tasks, animation of natural processes, abstract concepts in scientific research and pedagogical activity; - modern approaches to the design of database management systems (DBMS), expert systems and artificial intelligence systems, image recognition tasks; - modern mathematical methods, methods of applied mathematics, computer science for solving problems of science, education, technology, economics and management; - methods of teaching computer science, mathematics in higher educational institutions.

Types of professional activity	<ul style="list-style-type: none"> - pedagogical; - scientific research; - design and engineering; - production and technological; - organizational and managerial; - operational.
Learning Outcomes	<p>LO1 To analyze the philosophical problems of the development of civilization; freely use foreign languages for interpersonal and professional communication, independently acquire, develop skills in applying knowledge of an interdisciplinary and professional nature to solve non-standard problems, master social and psychological management technologies</p> <p>LO2 To form professional and pedagogical skills and culture of scientific and pedagogical thinking in higher education; develop the professional competence of the teacher; have the skills to work with methods and forms of training in the preparation of future specialists; application of modern educational technologies, including DOT</p> <p>LO3 To be able to analyze and manage the states of informatization, business processes, IS, the operating environment of the organization, to develop and support all types of support for IT projects of the organization</p> <p>LO4 Conduct security audit of computer systems and software; have the skills to develop recommendations for improving the management of processes and systems. D develop utilities for managing IC peripheral devices; have the skills to control the operation of devices through the I / O ports</p> <p>LO5 To develop a mathematical model of a process or phenomenon (tasks of science, education, technology, economics and management); formalize this model in the form of mathematical relationships. Build a computer model based on a mathematical model and conduct a computational experiment, checking its adequacy using factor analysis</p> <p>LO6 To practically work with mathematical applications Maxima, SciLab; with functional and logical programming tools for solving scientific and applied problems (including artificial intelligence and parallel computing problems, based on MPI and OpenMP technologies): program in Scheme, F #, and also define a functional approach in C ++ programming languages and C #.</p> <p>LO7 Develop, maintain and document software components and software applications of the IS; to develop software systems for solving applied problems of mobile devices; offer options for developing products, services and solutions using data mining methods based on big data.</p> <p>LO8 To develop services based on big data analytics; develop and implement new methods and technologies for using big data; visualize data; be able to reverse engineering the organization's business processes; have the skills to manage IT projects, apply the PERT analysis methodology</p> <p>LO9 demonstrate ability to organize and conduct independent research in the field of ICT; argue and develop sound recommendations; develop new models and methods for solving problems in various subject areas using information technologies; evaluate scientific, applied (professional) information and present it in the form of an analytical review.</p> <p>LO10 Apply methods of search engine optimization; have the skills to work effectively with a content management system (CMS); to</p>

	<p>recommend mathematical models and methods for use in the formalization and optimization of control problems; build models of applied problems, solve decision-making problems, optimize their results</p> <p>LO11 Possess the skills of computational experiment technology; optimization methods; approaches and methods used in solving artificial intelligence problems; apply skills and abilities in programming neural networks in pattern recognition tasks; skills in working with the main tools for building data mining.</p> <p>LO12 To choose the necessary research methods; carry out scientific research and experimental work; process the results obtained, analyze and present them in the form of completed research projects; master modern issues in the field of ICT</p>
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3. COMPETENCES OF THE EP GRADUATE

SOFT SKILLS (Behavioral skills and personal qualities)	
SS 1. Competence in one's literacy management	<p>SS 1.1. Strive for professional and personal growth throughout your life.</p> <p>SS 1.2. Constantly update their knowledge within the chosen trajectory and in the conditions of interdisciplinarity, carry out further training with a high degree of independence and self-regulation.</p> <p>SS 1.3. Be capable of reflection, objective assessment of their achievements, awareness of the need to form new competencies and continue their education in doctoral studies</p>
SS 2. Language competence	<p>SS 2.1. Ability to possess a sufficient level of communication in the professional field in the state, Russian and foreign languages for conducting negotiations and business correspondence.</p> <p>SS 2.2. The ability to possess mediation skills and cross-cultural understanding.</p>
SS 3. Mathematical competence and competence in the field of science	<p>SS 3.1. Ability to interpret methods of mathematical analysis and modeling for solving applied problems in the studied field</p> <p>SS 3.2. The ability to plan scientific experiments, integrate and implement the results of scientific research in the professional field.</p> <p>SS 3.3. The ability to analyze and comprehend modern methods of pedagogical and psychological science and apply them in pedagogical activity.</p>
SS 4. Digital competence, technological literacy	<p>SS 4.1. The ability to confidently use modern information and digital technologies, artificial intelligence systems for work, leisure and communication.</p> <p>SS 4.2. Proficiency in the use, recovery, evaluation, storage, production, presentation and exchange of information in a wide range of digital devices.</p> <p>SS 4.3. The ability to confidently use global information resources and apply technological literacy in research and analytical activities.</p>
SS 5. Personal, social and educational competencies	<p>SS 5.1. Knowledge of the norms of business ethics, social and ethical values and focus on them in professional activities.</p> <p>SS 5.2. Formation of a personality capable of mobility in the modern world, critical thinking and physical self-improvement.</p> <p>SS 5.3. The ability to work in a team, correctly, clearly and argumentatively defend their position during discussions and make professional decisions..</p> <p>SS 5.4. The ability to adequately navigate in various social spheres of activity and in conditions of uncertainty.</p> <p>SS 5.5. The ability to find compromises, correlate your opinion with the opinion of the team.</p>
SS 6. Entrepreneurial competence	<p>SS 6.1. The manifestation of leadership qualities and the ability to have a positive impact on others, to lead a team.</p> <p>SS 6.2. The ability to create conditions for the development of creative and entrepreneurial skills of the team.</p> <p>SS 6.3. The ability to work in the mode of uncertainty and rapid change of task conditions, make decisions, respond to changes in working conditions, allocate resources and manage your time.</p> <p>SS 6.4. Ability to work with consumer requests.</p>
SS 7. Cultural awareness and ability to self-	<p>SS 7.1. The ability to show ideological, civic and moral positions.</p> <p>SS 7.2. The ability to be tolerant of the traditions and culture of other</p>

expression	peoples of the world, to possess high spiritual qualities.
HARDSKILLS	
Theoretical knowledge and practical skills specific to this field	HS1 – The ability to develop a strategy, new technologies, design tools, determine design goals, performance criteria, limitations of applicability
	HS 2 – The ability to carry out modeling of processes and objects based on standard computer-aided design and research packages, predict the development of information systems and technologies
	HS 3 - The ability to operate telecommunication equipment, equipment of local area networks, servers and personal computers; to design computer and telecommunication networks, to ensure their protection and reliability of information transmission, according to the principles of building Web models on the Internet;
	HS 4 – The ability to provide author's support for the design, implementation and maintenance of information systems and technologies, to organize the interaction of developer and customer teams, to make management decisions in conditions of different opinions, to find the optimal solution
	HS 5 – The ability to develop methods for solving non-standard tasks and new methods for solving traditional tasks, to reproduce knowledge for the practical implementation of innovations, to train and train personnel, to master the methods of professional university pedagogy and scientific and pedagogical approaches using active teaching methods
	HS 6 – The ability to perform data analysis; manage the development of products, services and solutions based on big data.
	HS 7 – The ability to develop a modification plan and manage the work on the modification of an information system; to manage the maintenance and design of the modification of IS automating organizational management tasks and business processes
	HS 8 – The ability to conduct audits of information systems, platforms and operational procedures; assess ICT infrastructures from the point of view of risk to the organization
	HS 9 - The ability to plan work on system analysis and monitor their implementation; advise on the creation of business strategies of the system
	HS 10 – The ability to manage information resources; organize work on IT projects; coordinate work on ICT projects

3.1 MATRIX OF CORRELATING THE LEARNING OUTCOMES OF THE EP IN GENERAL WITH THE FORMED COMPETENCIES

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12
SS 1	+											
SS 2	+											
SS 3		+										
SS 4	+	+										
SS 5	+											
SS 6												
SS 7	+											
HS 1									+	+		+
HS 2					+							
HS 3				+		+						
HS 4			+				+					
HS 5		+			+				+			
HS 6			+					+				
HS 7						+	+		+	+		
HS 8				+								
HS 9			+									
HS 10											+	

4. MATRIX OF THE INFLUENCE OF MODULES AND DISCIPLINES ON THE FORMATION OF LEARNING OUTCOMES AND INFORMATION ON LABOR INTENSITY

№	Name of the module	cycle	comp onent	Name of the discipline	Brief description of the discipline	Qua ntity Cre dits	Formed learning outcomes (codes)													
							LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12		
	Module of Scientific and Pedagogical Training	BD	UC	History and philosophy of Science	Know and apply the basic provisions of the history and philosophy of natural and technical sciences: modern European science in culture and civilization, the emergence of science, its historical dynamics, the structure of scientific knowledge, philosophical problems of specific sciences. Communication technologies of the XXI century and their role in modern science. Philosophical problems of the development of modern global civilization. Modern topical methodological and philosophical problems of natural and social sciences and humanities.	4	v													
		BD	UC	Foreign Language (Professional)	To practice the main types of reading foreign language original sources with varying degrees of content coverage. To develop the skills of preparing written messages on scientific topics in the specialty: report, abstracts, abstracting, annotation, resume. Understand the general content of authenticated recordings. To listen to lectures, messages containing professional information. Develop oral communication skills in the specialty: report, presentation, scientific research, discussion, debate.	4	v													
		BD	UC	Psychology of Management	Use the basic provisions of management psychology: approaches and principles of psychological science in professional activities; the formation of a scientific and theoretical outlook on fundamental psychological concepts, the formation of skills and abilities of psychological research of personality, to have the skills to work with the main methods of experimental psychological research and the main directions of psychocorrectional work; features of managing conflicts, stresses and methods of their resolution.	4	v													
		BD	UC	Higher School Pedagogy	Apply the main provisions of higher education pedagogy: modern paradigms of higher education; the system of higher professional education in Kazakhstan; methodology of pedagogical science; professional competence of the teacher; organization of the educational process based on the credit	4		v												

				training system; higher school as a social institution for the upbringing and formation of a specialist's personality. Have the skills to work with methods and forms of training in the preparation of future specialists; with new educational technologies.															
Methodical Fundamentals of Teaching	PD	UC	Teaching Methods of Special Disciplines	Know and use the main provisions of the teaching methodology of specialized IT disciplines: means of information systems in education; idea about the activities of new information technologies; skills of effective use of new information technologies in professional activities; methods of teaching disciplines of information technology in higher education; methodology of DOT (distance learning technologies)	5	V	V												
			Pedagogical Practice	Develop professionally research culture in the field of ICT, as a condition of pedagogical skill and pedagogical creativity, to form professional and pedagogical skills, a culture of scientific and pedagogical thinking. Have skills development of educational and methodological documents for the major discipline; analyze lectures by leading teachers; skills of preparing and conducting all types of classes in special disciplines; apply new active forms of conducting classes	4	V	V												
Design of Information Systems Infrastructure	PD	EC	Analys, Modeling and Design of Information Systems	Apply risk assessment methods; methods and tools for risk management; plan system analysis work, taking into account the assumptions, constraints and dependencies of the organization's IT projects; monitor the performance of work on system analysis; evaluate and analyze the state of informatization of the organization; analyze business processes, IS, the operating environment of the organization; advise on the creation of business strategies for the system	4			V	V										
	PD	EC	Organization and Functioning of Information Systems	To practice the basic provisions of the organization and functioning of IS: principles of construction and functioning, structure and architecture, composition and purpose of elements; mathematical foundations and methods of automated data processing, design technology, the procedure for the development and putting into operation of working tasks, functional, mathematical, technical and information support.				V	V										

		PD	EC	Infrastructure of Information Systems	Assess the quality of computer systems and software and IT security vulnerabilities; determine the trajectories of expert audit in IS and IT audit; identify compliance with established corporate standards for efficiency, accuracy and safety; establish controls; skills to identify and formulate recommendations for improvement in existing risk management tools	6			V	V								
		PD	EC	Management by Peripheral Units of the Informative Systems	Know and use the basics of IC peripheral control. Have skills in managing processors, interaction of processes in distributed systems; solving the problem of exclusive use of shared resources in the system kernel; developing your own protected mode interrupt handlers, reprogramming the interrupt controller, controlling the operation of devices through the I / O ports; implementation of correct interaction of parallel processes; development of monitors for various operating systems, network administration.				V	V								
Scientific and Methodological Support of Scientific Activity		PD	EC	Innovative technologies of educational and research work	To form the skills of using the electronic scientific and educational space not only of an educational institution, region, education system of a particular country, but also globally; take into account the massiveness and continuity of education as factors in the development of the high-tech environment of universities; the transition from the massive introduction of individual software products to the creation of a distributed environment, cross-platform distribution, support for network distributed structures and services.	4					V							V
		PD	EC	Organization and planning of educational and research work	To form the ability to organize an independent scientific search on the problem; develop practical skills and abilities to apply scientific research methods when performing CPM; classify educational and research activities; choose the priority areas of educational and research work; analyze sources of scientific information						V							
		BD	EC	Technologies for the Development of Modern Software Systems	To be able to develop software systems in integrated production complexes, automated control systems for technical objects. Know the models and standards for the development of software systems. Methods and tools for developing software systems using CASE tools. To master the formal methods of describing the syntax and semantics of programming languages and the basic constructions of modern programming languages and their implementation in language processors.	5					V	V						

		BD	EC	Software in Professional Activities	To study and practically master the work with mathematical applications Maxima, SciLab ;; to practically master functional and logical programming tools for solving scientific and applied problems (including problems of artificial intelligence and parallel computing, based on MPI and OpenMP technologies): Scheme, F # languages, as well as a functional approach in C ++ and C# programming languages.						v	v							
				Research practice	Use theoretical knowledge: defining a problem, formulating a hypothesis and a task; developing a research plan, choosing the best research methods; process the results obtained, analyze them taking into account the level of knowledge of the problem; conduct bibliographic work; present the results of scientific research in the form of reports, abstracts, scientific articles, determine the degree of scientific elaboration of the selected research topic; substantiate the relevance, theoretical and practical significance of the work	7					v	v							
Data Management in Information System		BD	EC	Artificial data analysis technologies	To form theoretical knowledge, practical skills and abilities to apply modern methods of data mining; basic methods of consolidation, transformation, visualization, quality assessment, data cleaning and preprocessing; principles of construction and structural organization of data warehouses; statistical and machine methods of classification and regression; technology for building ensembles and comparing models; to be free to navigate the modern dynamic market of analytical software products.	5							v						
		BD	EC	Big data processing methods	To form theoretical knowledge and teach practical skills for analyzing large amounts of information: batch processing of data, MapReduce models, techniques for solving typical problems; streaming data processing and data processing methods "in real time" - with a minimum delay between the arrival of data and their processing; various data stores, use cases; tools that facilitate working with data, SQL engines; data processing automation systems.	5	v	v											
		PD	EC	Modern Technologies for Building Databases	To practice the basic laws and provisions of modern technologies for building databases: the basics and principles of building databases; handling large amounts of data; multidimensional and relational models; data mining methods; data mining using data mining methods. Have skills in working with technologies of using software products	5							v						

				Deductor Studio and MS SQL, Server 2008R2. Apply them in solving problems, perform, analyze and formulate conclusions.															
		PD	EC	Methods of the Automated Treatment of Large Volumes of Data	Analyze data using machine learning on the Microsoft Azure platform; analyze the effectiveness of internal processes and operational activities. Have skills in modeling the behavior of complex systems; analysis of various risks; prepare periodic reports with forecasts and data presentations; develop services based on big data analytics; develop and implement new methods and technologies for using big data; visualize data.							v							
		BD	EC	The latest Technologies for Processing and Managing Data in Information Systems	Use the latest data processing and management technologies; document the existing business processes of the customer's organization (reverse engineering of the organization's business processes); manage planning and development of requirements, resources; provide expert support for the development of IP architecture and the development of IP prototypes; plan the management of IP documentation. Have the skills to manage the effectiveness of the personnel in the project: manage the personnel in the project; develop and agree on regulations and procedures for the project management office.	5							v						
		BD	EC	Management of IT By Projects	Use methods for evaluating IT projects and drawing up a software development plan; risk assessment methods; specifics of copyright; method of using PERT analysis. Have the skills to manage IT projects; interact with customers / suppliers of products and services; coordinate the work of system analysts, programmers and other specialists; monitor the implementation of projects; control the completion of the necessary documentation.								v						
	Organization and Optimization of the Functioning of Information System	PD	EC	Mathematical Modeling in Scientific Researches	To be able to build a mathematical model of a process or phenomenon (problems of science, education, technology, economics and management), an approximate description of the system using mathematical relationships and replacing the original (investigated, controlled, operated) system with its mathematical model and further experimenting with this model using computational-logical algorithms. To master the skills for the practical use of modeling methods in research work	6								v					

	Module of research work and Final Attestation		Research work of a master student, including an internship and a master's thesis	Conduct bibliographic work; formulate and solve problems; choose the necessary research methods; apply modern information technologies in scientific research; process the results obtained, analyze and present them in the form of completed research projects; master the modern issues in the field of ICT; have specific specific knowledge on a scientific problem; carry out scientific research and experimental work; work with software products and Internet resources	24												V	V	V	
			Execution and Defense of Master`s Thesis	Unleash scientific potential, show the ability to organize and conduct independent research in the field of ICT; argue and develop sound recommendations; reveal the level of scientific qualifications; demonstrate the internal unity of work and display the progress and results of the development of the selected topic; apply the rules for the design and defense of a master's thesis; find out the readiness for work in an educational or research institution according to the profile.	12													V	V	V

5 SUMMARY TABLE ON THE VOLUME OF DISBURSED LOANS IN THE CONTEXT OF EP MODULES

Course of study	Semester	Number of acquired modules	Number of studied disciplines			Number of KZ credits					Total in hours	Total KZ credits	ammount	
			OC	HSC	EC	Theoretical teaching	Pedagogical practice	Research practice	SRW MS	Registration and defense of a master's thesis			exam	Diff.offset
1	1	4		4	3	28	-	-	2	-	900	30	7	1
	2			2	3	20	8	-	2	-	900	30	4	2
2	3	3		-	3	16	-	12	2	-	900	30	3	2
	4					-	-	-	18	12	900	30	-	1
Total		7	-	6	9	64	8	12	24	12	3600	120	14	6

6. STRATEGIES AND METHODS OF TEACHING, MONITORING AND EVALUATION

Learning strategies	<p>Student-centered learning: the student is a center of teaching/learning and an active participant in the learning and decision-making process.</p> <p>Practice-oriented training: orientation to the development of practical skills.</p>
Teaching methods	<p>Conducting lectures, seminars, various types of practice with</p> <ul style="list-style-type: none"> • using innovative technologies; • problem-based learning; • case study; • rational and creative use of information sources: • multimedia training programs; • electronic textbooks; • digital resources. <p>Organization of independent work of undergraduates, individual consultations.</p>
Monitoring and evaluation of the achievability of learning outcomes	<p>Current control on each topic of the discipline, control of knowledge in classroom and extracurricular classes (according to syllabus). Assessment forms:</p> <ul style="list-style-type: none"> • protection of laboratory work; • protection of individual tasks; • colloquiums; • presentations of essays, software products. <p>Boundary control at least twice during one academic period within the framework of one academic discipline.</p> <p>Intermediate certification is carried out in accordance with the working curriculum, academic calendar.</p> <p>Forms of holding:</p> <ul style="list-style-type: none"> • exam in the form of testing; • oral examination; • written exam; • combined exam; • project defense; • protection of practice reports. <p>Final state certification.</p>

7. EDUCATIONAL AND RESOURCE SUPPORT OF THE EP APPROVAL SHEET

<p>Information Center</p>	<p>Resource</p> <p>Educational and Information Center</p> <p>The structure of the EIC has 6 subscriptions, 16 reading rooms, 2 electronic resource centers (ERC). The basis of the network infrastructure of the OIC consists of 180 computers with Internet access, 110 automated workstations, 6 interactive whiteboards, 2 video doubles, 1 videoconferencing system, 3 scanners of A-4 format, 3. The software of the OIC – AIBS "IRBIS-64" for MSWindows (a basic set of 6 modules), an autonomous server for uninterrupted operation in the IRBIS system.</p> <p>The library fund is reflected in the electronic catalog available to users on the website http://lib.ukgu.kz is on-line 24 hours 7 days a week.</p> <p>Thematic databases of their own generation have been created: "Almamater", "Works of scientists of SKSU", "Electronic Archive". Online access from any device 24/7 via an external link http://articles.ukgu.kz/ru/ppp.</p> <p>Working with catalogs in electronic form. The EC consists of 9 databases: "Books", "Articles", "Periodicals", "Works of the teaching staff of SKSU", "Rare books", "Electronic Fund", "SKSU in print", "Readers" of "SKU".</p> <p>The JIC provides its users with 3 options for accessing its own electronic information resources: from the Electronic Catalog terminals in the catalog hall and divisions of the JIC; through the university's information network for faculties and departments; remotely on the library's website http://lib.ukgu.kz/.</p> <p>Access to international and republican resources is open: "SpringerLink", "Envoy", "Web of Science", "EVSSO", "Epigraph", to electronic versions of scientific journals in open access, "Zan", "RMEB", "Adebiet", Digital library "Akpigress", "Smart-kitar", "Kitar.kz", etc.</p> <p>For people with special needs and disabilities, the library's website has been adapted to the work of visually impaired users in the EIC</p>
<p>Material and technical base</p>	<p>The Department of Information Systems and Modeling has 3 computer classes with 28 computers with licensed software products MSWindows and MSOffice and antivirus protection. Specifications: ZIK PC-2 Work, processor (CPU)-Core i3-9100 3.6 GHz, motherboard (MB)-Gigabyte H310 LGA 1151, RAM –DDR4 8Gb, Hard disk (HDD)-1 Tb, DVD drive –DVD-RW, video adapter (VC) –Intel UHD Graphics 630, power supply-Broteko 500 W; Display monitor –ZIK 21.5. The department also has 4 lecture halls equipped with INITECH interactive whiteboards. The total square footage is 453.34 sq. m. In addition, laboratory classes can be held in university-wide computer classes.</p>

AGREEMENT SHEET
on the Educational program
7M06120 - "Information Systems"

Director of PGE _____ Konarbayeva Z. K.

Director of DASc _____ Nazarbek U. B.

Director of DE&C _____ Bazhirov T. S.