Institute of Automation and Information Technology
Department of Cybersecurity, Information Processing and Storage

EDUCATIONAL PROGRAM
7M06109- «Management information systems»

Code and classification of the field of education: 7M06 «Information and communication technologies»
Code and classification of training directions: 7M061 «Information and communication technologies»
Group of educational programs: M094 « Information technologies»
Level based on NQF: 7
Level based on IQF: 7
Study period: 1 years
Amount of credits: 60

Алматы, 2025

Educational program 7M06109 «Management of information systems» was approved at the meeting of K.I.Satbayev KazNRTU Academic Council
Minutes №10 dated «__06__» _03__ 2025

Was reviewed and recommended for approval at the meeting of K.I.Satbayev KazNRTU Educational and Methodological Council
Minutes №3 dated «__20__» __12____ 2024.

Educational program 7M06109 «Management of information systems» was developed by Academic committee based on direction 7M061 «Information and communication technologies».

	Last name first name patronymic	Post	Place of work	Signature
Chairman of the Academic Committee:				
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Zhumagaliev Birzhan Isimovich	Candidate of technical sciences	Associate Professor	NJSC "KazNRTU named after K.I. Satpaev",	
Representatives of employers:				
Mamyrbaev Orken Zhumazhanovich	PhD	Associate Professor	Deputy General Director RSE "Institute of Information and Computing Technologies"	
Teaching staff:				
Bostan Asylayim Erbolkyzy		3 years of study	NJSC "KazNRTU named after K.I. Satpaev"	
Bekmurat Orazmuhamed Kurmankhanuly		2 years of study	NJSC "KazNRTU named after K.I. Satpaev"	

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List of abbreviations and designations

EP Educational program
BC – basic competencies
PC – professional competencies
LO – learning outcomes
MOOC – massive open online courses
NQF – National Qualifications Framework
IQF – Industry Qualifications Framework

1. Description of educational program

The Master's degree program is structured according to the principle of modular training. The structure of the Master's degree program is formed from various types of educational and scientific work that determine the content of education.

The Master's degree program contains:

1) theoretical training, including the study of cycles of basic and core disciplines;
2) practical training of undergraduates: various types of practices, professional internships;
3) research work, including the implementation of a master's thesis,
4) intermediate and final attestations

2. Purpose and objectives of educational program

Purpose of EP: Training highly qualified specialists who can solve of tasks for receiving, storing, processing, analyzing, presenting and transmitting information using modern information and communication technologies.

Tasks of EP:

1. Setting goals and objectives of the designed information systems based on the analysis of the information needs of the organization.
2. Selection of modern technologies for designing and developing IT solutions.
3. Application of effective principles and methods of IT resource management.
4. The use of mathematical methods for modeling business processes of the organization, the development of algorithms for their implementation in information systems for various purposes.
5. Develop IP applications and algorithms for the functioning of IP modules based on domain analysis.
6. Training of technical staff on the development and maintenance of information systems and their subsystems

3. Requirements for evaluating the educational program learning outcomes

The educational program was developed in accordance with the State mandatory Standards of higher and Postgraduate Education, approved by the Order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 No. 2 (registered in the Register of State Registration of

Regulatory Legal Acts under No. 28916) and reflects the learning outcomes on the basis of which curricula are developed (working curricula, individual curricula of students) and working curricula in disciplines (syllabuses). Mastering disciplines of at least 10% of the total volume of credits of the educational program using MOOC on the official platform https://polytechonline.kz/cabinet/login/index.php /, as well as through the study of disciplines through the international educational platform Coursera https://www.coursera.org /.

Evaluation of learning outcomes is carried out according to the developed test tasks within the educational program in accordance with the requirements of the state mandatory standard of higher and postgraduate education.

When evaluating learning outcomes, uniform conditions and equal opportunities are created for students to demonstrate their knowledge, skills and abilities.

When conducting an interim certification in an online form, online proctoring is used.

4. Passport of educational program

4.1. General information

№	Field name	Comments
1	Code and classification of the field of education	7M06 «Information and communication technologies»
2	Code and classification of training directions	7M061 «Information and communication technologies»
3	Educational program group	M094 « Information technologies»
4	Educational program name	7M06109 - "Management of Information Systems"
5	Short description of educational program	The Master's degree program in the profile direction implements educational programs of postgraduate education for the training of managerial personnel with in-depth professional training. The program describes and regulates the procedure for training highly qualified specialists in the field of information management using modern information and communication technologies for all spheres of the national economy of Kazakhstan, capable of solving the tasks of effective management of both elements, processes and resources of the information system itself and other elements, processes and resources of the enterprise. The main functions of the professional activity of masters in the direction of "Information and communication technologies" are design, development, analysis, testing, implementation of information systems for various purposes and their components, information management support using modern technologies
6	Purpose of EP	Training highly qualified specialists who can solve of tasks for receiving, storing, processing, analyzing, presenting and transmitting information using modern information and communication technologies.
7	Type of EP	New EP
8	The level based on NQF	7
9	The level based on IQF	7
10	Distinctive features of EP	No
11	List of competencies of educational program	A graduate who has mastered master's degree programs must have the following general professional competencies: - the ability to apply in practice the knowledge of fundamental and applied sections of disciplines that determine the orientation (profile) of the master's degree program; – the ability to formulate research goals independently, establish the sequence of solving professional tasks; – the ability to professionally select and creatively use modern scientific and technical equipment to solve applied problems; – the ability to critically analyze, present, defend, discuss and disseminate the results of their professional activities; – proficiency in the preparation and execution of

		scientific and technical documentation, scientific reports, reviews, reports and articles; – willingness to lead a team in the field of their professional activities, tolerantly perceiving social, ethnic, confessional and cultural differences; – readiness to communicate orally and in writing in a foreign language to solve the tasks of professional activity; A graduate who has mastered the master's degree program must have professional competencies corresponding to the types of professional activities that the master's degree program is focused on:scientific and production activities : - the ability to independently carry out production and scientific–production, laboratory and interpretative work in solving practical problems; – the ability to professionally operate modern laboratory equipment and devices in the field of the master's degree program; – the ability to use modern methods of processing and interpreting complex information to solve production problems; project activity: – the ability to independently compile and submit projects of research and scientific-production works in the field of information security; – readiness to design complex research and scientific production works in solving professional tasks; organizational and managerial activities: – readiness to use practical skills in organizing and managing research and scientific-production work in solving professional tasks; - readiness for the practical use of regulatory documents in the planning and organization of scientific and production work in the field of information security
12	Learning outcomes of educational program	**ON1.** Make managerial and technical decisions, show sociability, initiative and psychological readiness for work, including when working in a team for partnership in the interests of sustainable development **ON2.** Apply the principles of using big data in enterprise architecture and methods of analytical processing and storage of big data in order to promote innovation. **ON3**. Design an information model of the subject area, use multi-user database administration methods, use modern DBMS to process databases. **ON4**. Critically analyze existing concepts, theories and approaches to the analysis of processes and phenomena. Be fluent in a foreign language at a professional level that allows you to conduct scientific research. **ON5**. Use project management methods in IT. Design and manage the development of a set of technical documentation

		ON6. Apply the methodology, models, methods, development and design tools for the development of information systems.
13	Education form	Full-time, online
14	Period of training	1 years
15	Amount of credits	60
16	Languages of instruction	Kazakh, Russian
17	Academic degree awarded	Master of Technical Sciences. English
18	Developer(s) and authors	Shukaev D.N. Satybaldieva R.J. Zhumagaliev B.I. Baymataeva S.M.

4.2. Relationship between the achievability of the formed learning outcomes based on educational program and academic disciplines

№	Name of the discipline	Brief description of the discipline	Number of credits	Generated learning outcomes (codes)					
				ON1	ON2	ON3	ON4	ON5	ON6
The cycle of basic disciplines The university component									
1	Foreign language (professional)	The purpose of the course is to improve and develop foreign language communication skills in the professional and academic fields. Course content: general principles of professional and academic intercultural oral and written communication using modern pedagogical technologies (round table, debates, discussions, analysis of professionally oriented cases, design).	2	v			v		
2	Management	The purpose of the discipline is to form a scientific understanding of management as a type of professional activity; to master the general theoretical principles of managing socio-economic systems; to master the skills and practical solutions to management problems; to study the world experience of management, as well as the specifics of Kazakhstani management, and to teach students how to solve practical issues related to managing various aspects of organizations.	2	v				v	
3	Psychology of management	Objective: To acquire skills in making strategic and managerial decisions, taking into account the psychological characteristics of the individual and the team. Content: the modern role and content of psychological aspects in management activities, methods of improving psychological literacy, the composition and structure of management activities, both at the local and foreign levels, the psychological peculiarity of modern managers.	2	v			v		
The cycle of basic disciplines Component of choice									

4	Analysis and modeling of information systems	In the process of studying the discipline, undergraduates should: know modern methods of analyzing information systems and processes, an apparatus for simulating random and non-stationary parameters of complex systems; be able to apply intelligent simulation tools, computer modeling technology; have skills in organizing computational experiments and using an object-oriented apparatus for analyzing and modeling information processes.	4			v			v
5	Methods and applications of computer modeling	Methods modeling of parameters and processes with specified or predicted patterns of their values. The study of typical modeling schemes for processes occurring in various systems. Application of computer modeling methods in production, logistics, organizational, economic and financial systems, taking into account instability and conflict situations.	4		v				v
The cycle of profile disciplines The university component									
6	Management of IT projects and information risks	The purpose of mastering the discipline is to form knowledge, skills and abilities in the field of risk management of IT projects, theoretical and practical mastery of modern risk analysis and assessment tools, study the requirements for the development of documentation on risk identification and assessment, familiarization with the principles and methods of risk management to improve business processes and IT infrastructure of the enterprise.	4	v				v	v
7	IT management	The purpose of the course is to study the concepts, goals and objectives of information management. The issues covered in the course are: enterprise architecture and its management; concepts, methodologies and standards of corporate governance; methodologies and standards of information technology management; trends and prospects of information management development. As a result of mastering the discipline, undergraduates will be able to apply management methodology in IT projects.	5	v	v			v	
The cycle of profile disciplines									

Component of choice									
8	Methodology of scientific research and innovative activity	The discipline studies the methods and principles of building information retrieval systems (IPS) and their practical application. The presentation of information in IPS, the principles of text analysis and document indexing, typical models (Boolean and vector) and algorithms for information retrieval are considered. Basic information about the classification of documents is provided. The course examines modern vocabulary, classification, and meta-search IPS, their practical application, and performance criteria.	5		v				v
9	Business process modeling methods	The course is aimed at developing students' skills in modeling and analyzing business processes in order to solve applied problems. The content of the discipline includes questions about the system, process-oriented approach to business management, methodologies and models, tools for modeling and analyzing business processes and managing complex systems. In the course of studying the discipline, undergraduates use modern tools for modeling and analyzing business processes.	5	v				v	v
10	Models and methods of decision-making in IP	The purpose of teaching the discipline is to study models and methods used in decision support systems, as well as in the development of modern computer information systems. The content of the discipline includes mathematical methods of operation research, methods for solving nonlinear problems of unconditional optimization, methods for solving nonlinear problems of conditional optimization, application of methods and methodology of operation management in the development of computer information processing and control systems.	5	v				v	v
11	Business Intelligence (Coursera)	The course aims to provide undergraduates with a set of theoretical knowledge and practical skills in applying modern business intelligence information tools to business management. During the practical training, undergraduates master the skills of working in the most popular business intelligence platforms.: Power BI, Qlik Sense, Tableau for decision support in marketing and business management; OLAP	5		v			v	

		(online analytical processing) skills in solving analytical tasks: exploratory analysis, data research, analytical reporting.							
12	Cloud computing	The course will allow you to gain the competencies necessary to work with cloud systems with different settings. The course content addresses the following issues: data collection, visualization, storage, security and automation; designing and deploying a cloud storage system; developing the most convenient and effective strategy for migrating legacy systems to the cloud; developing testing methods to evaluate the effectiveness of corporate cloud systems in order to make recommendations for their improvement.	5		v				v
13	Data mining	Data minig is an interdisciplinary discipline that studies the analysis and processing of data of various structures and volumes. Data mining methods are important in the research and development of information systems that solve problems of data analysis, forecasting various indicators in various fields of human activity. In this discipline, students learn both visual and analytical methods to determine the structure of data. The methods of descriptive, cluster, variance, regression data analysis and other parametric and nonparametric methods are studied. During the research, the students use both software packages and special programming languages.	5		v	v			

NON-PROFIT JOINT STOCK COMPANY
"KAZAKH NATIONAL RESEARCH TECHNICAL UNIVERSITY NAMED AFTER K.I. SATBAYEV"

SATBAYEV UNIVERSITY

«APPROVED»
Decision of the Academic Council
NPJSC«KazNRTU
named after K.Satbayev»
dated 06.03.2025 Minutes № 10

WORKING CURRICULUM

Academic year: 2025-2026 (Spring, Autumn)
Group of educational programs: D094 - "Information technologies"
Educational program: 7M06109 - "Management of information systems"
The awarded academic degree: Master of engineering and technology
Form and duration of study: full time (professional track) - 1 years

Discipline code	Name of disciplines	Block	Cycle	Total ECTS credits	Total hours	lek/lab/pr Contact hours	in hours SIS (including TSIS)	Form of control	Allocation of face-to-face training based on courses and semesters		Prerequisites
									1 course		
									1 sem	2 sem	
CYCLE OF GENERAL EDUCATION DISCIPLINES (GED)											
CYCLE OF BASIC DISCIPLINES (BD)											
M-1. Module of basic training (university component)											
LNG212	Foreign language (professional)		BD, UC	2	60	0/0/30	30	E	2		
MNG726	Management		BD, UC	2	60	15/0/15	30	E	2		
HUM218	Psychology of management		BD, UC	2	60	15/0/15	30	E	2		
CSE772	Analysis and modeling of information systems	1	BD, CCH	4	120	15/0/30	75	E	4		
CSE771	Methods and Applications of Computer Simulation	1	BD, CCH	4	120	30/0/15	75	E	4		
CYCLE OF PROFILE DISCIPLINES (PD)											
M-2. Module of professional activity (university component, component of choice)											
SEC251	IT project and information risk management		PD, UC	4	120	30/0/15	75	E	4		
CSE767	Data mining	1	PD, CCH	5	150	30/0/15	105	E	5		
CSE207	Methods of modeling business processes	1	PD, CCH	5	150	30/0/15	105	E	5		
CSE211	Models and methods of decision-making in IP	2	PD, CCH	5	150	15/15/15	105	E	5		
CSE769	Methods and tools for building information retrieval systems	2	PD, CCH	5	150	30/0/15	105	E	5		
CSE764	Cloud computing	3	PD, CCH	5	150	30/0/15	105	E	5		
SEC232	Business Intelligence	3	PD, CCH	5	150	30/0/15	105	E	5		
CSE765	IT management		PD, UC	5	150	30/0/15	105	E		5	
M-3. Practice-oriented module											
AAP253	Internship		PD, UC	5				R		5	
M-4. Experimental and research module											
AAP257	Experimental research work of a master student, including an internship and the implementation of a master's project		ERWMS	13				R		13	
M-5. Module of final attestation											
ECA213	Design and defense of the master's project		FA	8						8	
Total based on UNIVERSITY:									29	31	
									60		

Number of credits for the entire period of study

Cycle code	Cycles of disciplines	Credits			
		Required component (RC)	University component (UC)	Component of choice (CCH)	Total
GED	Cycle of general education disciplines	0	0	0	0
BD	Cycle of basic disciplines	0	6	4	10
PD	Cycle of profile disciplines	0	14	15	29
Total for theoretical training:		0	20	19	39
RWMS	Research Work of Master's Student				0

ERWMS	Experimental Research Work of Master's Student				13
FA	Final attestation				8
TOTAL:					60

Decision of the Educational and Methodological Council of KazNRTU named after K.Satpayev. Minutes № 3 dated 20.12.2024

Decision of the Academic Council of the Institute. Minutes № 4 dated 22.11.2024

Signed:

Governing Board member - Vice-Rector for Academic Affairs	Uskenbayeva R. K.
Approved:	
Vice Provost on academic development	Kalpeyeva Z. S.
Head of Department - Department of Educational Program Management and Academic-Methodological Work	Zhumagaliyeva A. S.
acting Director of Institute - Institute of Automation and Information Technologies	Chimbayev Y. T.
Department Chair - Cybersecurity, information processing and storage	Satybaldiyeva R. Zh.
Representative of the Academic Committee from Employers ___Acknowledged___	Mamyrbayev O. Z.