

«Kazakh University of Technology and Business named after K.Kulazhanova» JSC

**EDUCATIONAL PROGRAM**

**7M06138 - Information systems**

*Code and name of the educational program*

**Level: Master's (profile)**

Approved

by the Board of Directors of JSC

«K. Kulazhanov KazUTB» «12» 03.2026,  
protocol No. 4



Recommended

by the Academic Council of JSC

«K. Kulazhanov KazUTB» «27» 02.2026,  
protocol No. 7

**Astana – 2026**

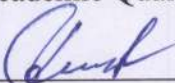
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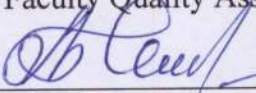
## Preface

The educational program «7M06138 - Information Systems» was developed in accordance with the requirements of the State Mandatory Standard 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, as well as on the basis of professional standards: «Software Architects» No. 569/NK on November 10, 2025; Atlas new professions and competencies in the Republic of Kazakhstan «DevOps engineer»; Regional atlases of new professions and competencies of the Karaganda region "Data Scientist".

The Educational Program «7M06138 - Information Systems» was approved at the meeting of the Council on Academic Quality from on 01 2024 Minutes No. 3.

Chairperson  Askarbekov E.B.

The Educational Program «7M06138 - Information Systems» was reviewed and approved at the meeting of the Faculty Quality Assurance Commission on 12 2024 Minutes No. 31-1.

Chairperson  Serimbetov B.A.

The Educational Program «7M06138 - Information Systems» was developed and discussed at the meeting of the Department of Information Technologies on 10 2024 Minutes No. 5.

Head of the Department  Abdugarimova A.A.

## Approval sheet

Educational program 7M06138- «Information Systems»  
(code and name of the EP)

**AGREED:**

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Master's student

J.N.Kabdulla

"10" "12" 2025 year

## 1 Passport of the educational program

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| International Standard Classification of Education (ISCED) level | 7                                                                                                                                                                                                                                                                                                                                                                    |
| National Qualifications Framework (NQF) level                    | 7                                                                                                                                                                                                                                                                                                                                                                    |
| Sectoral Qualifications Framework (SQF) level                    | 7                                                                                                                                                                                                                                                                                                                                                                    |
| Code and name of the field of education                          | 7M06-Information and communication technologies                                                                                                                                                                                                                                                                                                                      |
| Direction of training                                            | 7M061-Information and communication technologies                                                                                                                                                                                                                                                                                                                     |
| Number and name of the group of educational programs             | M094-Information technology                                                                                                                                                                                                                                                                                                                                          |
| Code and name of the educational program (EP)                    | 7M06138-Information systems                                                                                                                                                                                                                                                                                                                                          |
| Educational program profile                                      | Profile                                                                                                                                                                                                                                                                                                                                                              |
| Goal of the educational program                                  | Formation of students' professional competencies to solve practical problems of digitalization, optimize processes and improve management efficiency in the context of widespread digitalization, training practice-oriented IT specialists capable of developing, implementing, and managing modern IP in various sectors of the economy using digital technologies |
| Completion criterion of an educational program                   | At least 60 academic credits, including all types of academic activities of a master's student                                                                                                                                                                                                                                                                       |
| Language of instruction of the educational program               | Kazakh, russian                                                                                                                                                                                                                                                                                                                                                      |
| Distinctive features of the educational program                  | -                                                                                                                                                                                                                                                                                                                                                                    |
| Partner University                                               | -                                                                                                                                                                                                                                                                                                                                                                    |

## 2 Qualification characteristics of the graduate of the educational program

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Degree awarded                     | Master of Engineering and Technology in the educational program 7M06138-<br>"Information Systems"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Field of professional activity     | Organizational and managerial:<br>– Managing the activities of IT departments and organizations involved in IT projects;<br>– Development and implementation of innovative forms of management of organizations and other branches of human activity.<br>Scientific research:<br>– Scientific research in the field of information and communication technologies.<br>Project information:<br>– Development and maintenance of software for various branches of human activity.<br>Pedagogical:<br>– Implementation of educational services in the field of information and communication technologies. |
| Types of professional activities   | Design and engineering, production and technological, organizational and managerial, scientific research and experimental research.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Objects of professional activity   | Enterprises and organizations of various forms of ownership, whose activities are related to the development, implementation and maintenance of information technologies and systems in various fields of human activity.                                                                                                                                                                                                                                                                                                                                                                               |
| Functions of professional activity | – Management of methods and methods of interaction and modernization of software.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

### 3 Requirements for the content of the educational program

| Name of cycles and disciplines                                                              | Workload in academic credits |
|---------------------------------------------------------------------------------------------|------------------------------|
| <b>Theoretical training</b>                                                                 | <b>39</b>                    |
| <b>The cycle of basic disciplines (BD)</b>                                                  | <b>10</b>                    |
| University component                                                                        | 6                            |
| Component of choice                                                                         | 4                            |
| <b>Cycle of profile disciplines (PD)</b>                                                    | <b>29</b>                    |
| University component                                                                        | 5                            |
| Component of choice                                                                         | 10                           |
| Industrial practicum                                                                        | 14                           |
| Experimental research work of a master's student, including internship and master's project | 13                           |
| Final assessment (Registration and defense of the master's project) (OiZMP)                 | 8                            |
| <b>Total</b>                                                                                | <b>60</b>                    |

#### 4 Competency map of the educational program «7M06136 - Information systems»

| Competence map of the educational program              | Learning outcome code | Learning Outcome (according to Bloom's Taxonomy)                                                                                                      |
|--------------------------------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Behavioral skills and personal qualities (Soft skills) | LO 1                  | Applies business communication skills in a foreign language for effective interaction and professional communication in an international environment. |
|                                                        | LO 2                  | Implements leadership skills and managerial competencies in decision-making in conditions of uncertainty and global competition.                      |
| Digital competencies (Digital skills)                  | LO 3                  | Interprets the results of processing large amounts of data using machine learning methods to make managerial and technical decisions.                 |
| Professional skills (Hard skills)                      | LO 4                  | Organizes the processes of data transmission, storage, processing and management in information systems.                                              |
|                                                        | LO 5                  | Modernizes software tools and methods of interaction in information systems based on the analysis of current threats and vulnerabilities.             |

### 5 Learning outcomes of the educational program and modules

| Key competencies | Learning Outcomes (LO) for the educational program                                                                                                        | Name of module                                        | Learning outcomes for the module                                                                                                                                                                                                   | Name of disciplines that form learning outcomes |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
|                  | LO1 Applies business communication skills in a foreign language for effective interaction and professional communication in an international environment. | Basic disciplines module                              | Uses the techniques of logical analysis of scientific texts in a foreign language. Demonstrates knowledge of modern methods and technologies of professional communication in a foreign language                                   | Foreign Language (Professional)                 |
|                  | LO2 Implements leadership skills and managerial competencies in decision-making in conditions of uncertainty and global competition.                      |                                                       | Implements leadership and managerial competencies in strategic decision-making, effective resource management, and achieving organizational goals in an environment of uncertainty and global competition.                         | Advanced Management                             |
| Digital skills   | LO3 Interprets the results of processing large amounts of data using machine learning methods to make managerial and technical decisions.                 | Intelligent information systems and big data analysis | They have the knowledge and skills to apply machine learning methods to analyze big data, build intelligent models, and solve practical problems in their professional activities.                                                 | Machine Learning<br>Big Data Analysis           |
| Hardskills       | LO3 Interprets the results of processing large amounts of data using machine learning methods to make managerial and technical decisions.                 |                                                       | Develops and analyzes conceptual and theoretical models for solving scientific and applied problems in the field of information technology.<br>He is proficient in modern methods and tools for analyzing and processing big data. | Big Data Processing and Analysis                |
|                  | LO3 Interprets the results of processing large amounts of data using machine learning methods to make managerial and technical decisions.                 | Analysis and mathematical                             | They master the methods of mathematical and algorithmic modeling in the analysis of problems of engineering and natural sciences                                                                                                   | Decision Support Models and Methods             |

|                                                                                                                                               |                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| LO4 Organizes the processes of data transmission, storage, processing and management in information systems.                                  | Fundamentals of Information Systems and Information Process Management | Has knowledge of data collection. Understands data collection processes and methods, including automated collection, user input, and integration of data from various sources.<br>Knows the principles and methods of data storage, including the selection of suitable storage technologies (relational and non-relational databases, file systems, cloud storage, etc.), as well as managing the capacity and performance of data storage. | Information Systems Data Management                                        |
| LO4 Organizes the processes of data transmission, storage, processing and management in information systems.                                  | Fundamentals of Information Systems and Information Process Management | The organization of information processes at the physical and channel levels, the study of modern methods and models of building information systems of various types.                                                                                                                                                                                                                                                                       | Theoretical Foundations of Information Processes                           |
| LO5 Modernizes software tools and methods of interaction in information systems based on the analysis of current threats and vulnerabilities. | Fundamentals of Information Systems and Information Process Management | Has knowledge of the implementation of technical security measures, the skills to install, configure and maintain technical security tools such as firewalls, intrusion detection systems, antivirus programs, etc.<br>Manages security processes, monitors, analyzes threats, responds to incidents, performs security audits and reviews.                                                                                                  | Information System Security Management                                     |
|                                                                                                                                               | Analysis and mathematical                                              | He got acquainted with the possibilities of using blockchain technology in making managerial decisions, such as automating business processes, increasing transparency and reliability of data, in relation to financial accounting, logistics and document management.                                                                                                                                                                      | Blockchain Technology in the Digital Transformation of Information Systems |

**6 The relationship between the attainability of the formed learning outcomes according to the educational program and academic disciplines**

| №                                        | Name of the discipline           | Brief description of the discipline                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Number of credits | Intended Learning Outcomes (Codes) |      |      |      |      |
|------------------------------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------------------------|------|------|------|------|
|                                          |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   | LO 1                               | LO 2 | LO 3 | LO 4 | LO 5 |
| Cycle of basic disciplines               |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |                                    |      |      |      |      |
| University component/ Elective component |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |                                    |      |      |      |      |
| 1                                        | Foreign language (professional)  | The discipline is aimed at developing academic communication and intercultural interaction in a global environment. In the course of study, the master's student systematizes specialized information from foreign sources and engages in professional interaction in a foreign language. This enables the effective resolution of production tasks, the preparation of reporting documentation, and the presentation of work results to partners, thereby enhancing the specialist's competitiveness at an international level. | 3                 | +                                  |      |      |      |      |
| 2                                        | Advanced Management              | The discipline is aimed at developing systemic managerial competencies and leadership potential for organizational management. The curriculum covers the development of leadership influence, the substantiation of strategic business priorities, and the modeling of adaptive management structures. Students apply leadership skills and managerial competencies when making decisions under conditions of uncertainty, risk, and global competition.                                                                         | 3                 |                                    | +    |      |      |      |
| 3                                        | Big Data Processing and Analysis | The discipline is aimed at studying methods and technologies of working with large amounts of information. Data analysis tools such as Pig and Hive, as well as the MapReduce model, are considered. As a result of studying the discipline, the student develops algorithms for data analysis and processing.                                                                                                                                                                                                                   | 4                 |                                    |      | +    |      |      |

|                                                                                                            |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   |  |  |  |   |   |   |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--|--|--|---|---|---|
| 4                                                                                                          | Machine Learning for Big Data Analysis           | The discipline is aimed at studying methods of analyzing, processing and interpreting large amounts of data using machine learning algorithms. The methods of machine learning and big data analysis, including data processing, model training and quality assessment, are considered. As a result of studying the discipline, the student applies machine learning methods to analyze big data and solve applied problems in various subject areas.                                                                                                                                 | 4 |  |  |  | + |   |   |
| <p align="center"><b>Cycle of major disciplines</b><br/><b>University component/Elective component</b></p> |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   |  |  |  |   |   |   |
| 6                                                                                                          | Theoretical Foundations of Information Processes | The discipline is aimed at studying the theoretical foundations of information and information processes, the patterns of its reception, transmission, storage and processing in various systems. The properties of information, methods of its representation and encoding, models of information processes, as well as principles of functioning of information systems and technologies are studied. As a result of studying the discipline, the student applies theoretical knowledge about information processes to analyze, organize and effectively use information resources. | 5 |  |  |  |   | + |   |
| 7                                                                                                          | Information System Security Management           | The discipline is aimed at studying methods of information system security management and data protection in a digital environment. Technologies for protecting network infrastructure, vulnerability analysis, and privacy are being studied. As a result of studying the discipline, the student applies information system security management methods.                                                                                                                                                                                                                            | 5 |  |  |  |   |   | + |

|    |                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |  |  |  |  |   |   |
|----|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--|--|--|--|---|---|
| 8  | Information Systems Data Management                                        | The discipline focuses on the study of data management methods in IP, storage, processing, integration and protection. Database models and architecture, quality management and data recovery, and optimization methods are considered. As a result of studying the discipline, the student manages data in information systems, ensures their storage, processing and protection.                                                            | 5 |  |  |  |  | + |   |
| 9  | Decision Support Models and Methods                                        | The discipline is aimed at studying models and methods of decision support in complex systems and management tasks. Mathematical and computational models, multicriteria analysis methods, optimization approaches, game theory, Bayesian networks and machine learning methods are considered. As a result of studying the discipline, the student knows the methods and models of decision support.                                         | 5 |  |  |  |  |   | + |
| 10 | Blockchain Technology in the Digital Transformation of Information Systems | The discipline is aimed at studying blockchain technologies in the digital transformation of information systems. Approaches to the integration of blockchain technologies into information systems are being studied to increase security, transparency and automation of processes. As a result of studying the discipline, the student applies blockchain technologies in information systems, evaluates their security and effectiveness. | 5 |  |  |  |  | + |   |

**7 Alignment of planned learning outcomes with assessment technologies and teaching methods within the module**

| <b>Learning Outcomes (LO) Number</b> | <b>Planned learning outcomes for the module</b>                                                                                                       | <b>Assessment technologies (tools)</b>                                                                                   | <b>Methods of learning and teaching</b>                                        |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| LO 1                                 | Applies business communication skills in a foreign language for effective interaction and professional communication in an international environment. | Oral survey (exam, theoretical assessment). Test, Situational problem solving                                            | Information theory (demonstration of educational material, explanation, story) |
| LO 2                                 | Implements leadership skills and managerial competencies in decision-making in conditions of uncertainty and global competition.                      | Oral survey (exam, theoretical assessment). Test, Situational problem solving                                            | Information theory (demonstration of educational material, explanation, story) |
| LO 3                                 | Interprets the results of processing large amounts of data using machine learning methods to make managerial and technical decisions.                 | Oral survey (exam, theoretical assessment). Test, presentation                                                           | Information theory (demonstration of educational material, explanation, story) |
| LO 4                                 | Organizes the processes of data transmission, storage, processing and management in information systems.                                              | Oral survey (exam, theoretical assessment). Control work. Presentation. A case study. Multi-level tasks and assignments. | Information theory (demonstration of educational material, explanation, story) |
| LO 5                                 | Modernizes software tools and methods of interaction in information systems based on the analysis of current threats and vulnerabilities.             | Oral survey (exam, theoretical assessment). Control work. Presentation. A case study.                                    | Search and creative teaching methods (observation, experience, experiment)     |

**8 Correlation of learning outcomes of the educational program with the labor functions of professional standards (if any)**

| <b>Name of the professional standards used</b>        | <b>Professions at level 6 and or (7) of the SQF</b>                                                                                                                            | <b>Labor functions</b>                                                                                                                                                                                       | <b>Tasks</b>                                                               | <b>Learning outcomes for the educational program</b>                                                                                           |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Software Architect                                    | Software Architect                                                                                                                                                             | Labor function 2<br>Management of methods and methods of interaction and modernization of software                                                                                                           | Skill 1:<br>Management of methods and methods of human-machine interaction | LO 5 Modernizes software tools and methods of interaction in information systems based on the analysis of current threats and vulnerabilities. |
| Atlas of new professions "Information Technology"     | DevOps Engineer                                                                                                                                                                | Key competencies of the profession:<br>– Interaction with all components of the product development process;<br>– Organization of effective collaboration and synchronization of product development stages. |                                                                            | LO 4 Organizes the processes of data transmission, storage, processing and management in information systems.                                  |
| Regional atlas of professions of the Karaganda region | Data Specialist(Data Scientist)                                                                                                                                                | Skills:<br>– Knowledge of machine learning algorithms, statistics, programming (often Python or R), ability to work with databases and data visualization tools.                                             |                                                                            | LO 3 Interprets the results of processing large amounts of data using machine learning methods to make managerial and technical decisions.     |
| Personal competence requirements                      | Responsibility, Strategic thinking, Flexibility of thinking, Analytical thinking, Logical thinking, Performance, Result orientation, Organization, Creativity, Problem solving |                                                                                                                                                                                                              |                                                                            |                                                                                                                                                |

## 9 Graduate model

| GRADUATE MODEL                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>"Software Architects" dated No. 569 / NK dated 11/10/2025</p> <p>Teacher (faculty) of organizations of higher and (or) postgraduate education No. 591 dated 11/20/2023</p> <p>Atlas of new professions and competencies in the Republic of Kazakhstan "DevOps Engineer"</p> <p>Regional atlases of new professions and competencies, Karaganda region.</p> <p>«Data Scientist»</p> | Competencies (soft skills, digital skills)                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                       | Attributes of a graduate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Knowledge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>– High professionalism in the field of IT technology and business;</li> <li>– Emotional intelligence;</li> <li>– Adaptability to global challenges;</li> <li>– Leadership;</li> <li>– Entrepreneurial thinking;</li> <li>– Global citizenship;</li> <li>– Understanding the importance of principles and culture of academic integrity;</li> <li>– Communication competencies;</li> <li>– Learning skills necessary for independent continuation of further education.</li> </ul> | <ul style="list-style-type: none"> <li>– IP concepts, models and architectures (client-server, cloud, SOA/microservices).</li> <li>– System analysis, business process and data modeling (BPMN, UML, ER).</li> <li>– Databases and repositories: modeling, SQL/NoSQL, transactions, indexes, sharding.</li> <li>– Integration and data exchange: API, web services, queues, event buses.</li> <li>– Data processing and Big Data: distributed systems, ETL/ELT, streaming processing.</li> <li>– Analytics and ML: Data Mining/ML methods, model quality assessment, visualization.</li> <li>– IP LC management: standards and methodologies (Agile, ITIL), testing and quality.</li> <li>– Information security: threat models, cryptography, IAM, compliance.</li> <li>– Reliability and operation: monitoring, performance, observability.</li> <li>– Research foundations: research methods, search and critical analysis of</li> </ul> | <ul style="list-style-type: none"> <li>– Analyze requirements and model processes/data (BPMN, UML, ER).</li> <li>– Design the architecture of the IC and database (SOA/microservices, normalization, indexing).</li> <li>– Develop and integrate software, document and publish APIs.</li> <li>– Configure CI/CD, containerization, and orchestration (Docker, Kubernetes).</li> <li>– Plan projects (Agile/Scrum), manage quality and testing (unit/integration/e2e).</li> <li>– Build data pipelines (ETL/ELT), apply ML/analytics, make dashboards.</li> <li>– Provide information security: authentication, authorization, encryption, compliance with requirements.</li> <li>– Operate and maintain: monitoring, incidents, performance and cost optimization.</li> <li>– Conduct research, prepare reports/publications, prototype (PoC/MVP).</li> <li>– Communicate effectively, work in a team, manage risks, deadlines, and budget.</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | literature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
|  | Professional skills (hard skills)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
|  | <ul style="list-style-type: none"> <li>– Defines the essence and content of the processes of management, management, entrepreneurship and management;</li> <li>– Has the ability to establish communication and decision-making processes; has the ability to choose an effective leadership style and leadership, methods of managing groups, conflicts, and stress;</li> <li>– Possesses communication skills to communicate with colleagues and customers in the process of project development, as well as participates in the organization and management of projects</li> <li>– Calculates and prepares a business plan and project analysis of an investment and business project</li> <li>– Applies regulations for the organization of life cycle management of IT infrastructure and activities of IT enterprises</li> </ul> |  |

Білім беру бағдарламасының коды және атауы: 7M06138 - «Ақпараттық жүйелер»  
Код и наименование образовательной программы: 7M06138 - «Информационные системы»  
Code and Name of the educational program : 7M06138 - "Information Systems"

[illegible]

|                                                                           |                                                                                                                                                                                                                                                                                                                                              |                             |                                                    |     |    |     |    |    |    |    |    |                                   |                                                                    |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------------------------|-----|----|-----|----|----|----|----|----|-----------------------------------|--------------------------------------------------------------------|
| 9                                                                         | Ақпараттық жүйелердің деректерін басқару/<br>Управление данными информационных систем /<br>Information Systems Data Management                                                                                                                                                                                                               | БП ТК /<br>ПД КВ /<br>MD EC | UDIS 5301-26<br>UDIS 5301-26<br>UDIS 5301-26       | 1   | 5  | 150 | 45 | 30 | 15 | 15 | 90 | 2+1+0                             | на азыме оубуны<br>in the language of instruction                  |
| Барлығы модуль бойынша / Итого по модулю / Total for module               |                                                                                                                                                                                                                                                                                                                                              |                             |                                                    |     |    |     |    |    |    |    |    |                                   |                                                                    |
| Талдау және математикалық модельдеу/Анализ и математическое моделирование |                                                                                                                                                                                                                                                                                                                                              |                             |                                                    |     |    |     |    |    |    |    |    |                                   |                                                                    |
| 10                                                                        | Шешім қабылдауды қолдау модельдері мен әдістері/<br>Модели и методы поддержки принятия решений/<br>Decision Support Models and Methods                                                                                                                                                                                                       | БП ТК /<br>ПД КВ /<br>MD EC | MMPPR5302-26<br>MMPPR5302-26<br>MMPPR5302-26       |     |    |     |    |    |    |    |    |                                   |                                                                    |
| 11                                                                        | Ақпараттық жүйелерді цифрлық трансформациялаудағы блокчейн технологиясы/<br>Технология блокчейн в цифровой трансформации информационных систем/<br>Blockchain Technology in the Digital Transformation of Information Systems                                                                                                                | БП ТК /<br>ПД КВ /<br>MD EC | TBCTIS 5302-26<br>TBCTIS 5302-26<br>TBCTIS 5302-26 | 1   | 5  | 150 | 45 | 30 | 15 | 15 | 90 | 2+1+0                             | оқыту тілінде<br>на азыме оубуны<br>in the language of instruction |
| 12                                                                        | Өндірістік практика<br>Производственная практика/<br>Manufacturing practice                                                                                                                                                                                                                                                                  | БП<br>ПД<br>MD              | PP 5302-26<br>PP 5302-26<br>PP 5302-26             | 2   | 14 | 420 |    |    |    |    |    | 14 апта/<br>14 недели/<br>14 week | оқыту тілінде<br>на азыме оубуны<br>in the language of instruction |
| Барлығы модуль бойынша / Итого по модулю / Total for module               |                                                                                                                                                                                                                                                                                                                                              |                             |                                                    |     |    |     |    |    |    |    |    |                                   |                                                                    |
| Зерттеу қызметі /Исследовательская деятельность/Research activities       |                                                                                                                                                                                                                                                                                                                                              |                             |                                                    |     |    |     |    |    |    |    |    |                                   |                                                                    |
| 13                                                                        | Тағылымдамалардан оту мен магистрлік жұмыны орындауды қамтитын магистранттың эксперименттік-зерттеу жұмысы (МЭЗЖ)<br>Экспериментально-исследовательская работа магистранта, включая прохождение стажировки и выполнение магистерского проекта<br>Experimental research work of a master's student, including internship and master's project |                             |                                                    | 1,2 | 13 | 390 |    |    |    |    |    | 5 апта/<br>5 недели/<br>5 week    | оқыту тілінде<br>на азыме оубуны<br>in the language of instruction |
| Барлығы модуль бойынша / Итого по модулю / Total for module               |                                                                                                                                                                                                                                                                                                                                              |                             |                                                    |     |    |     |    |    |    |    |    |                                   |                                                                    |
| Корытынды аттестаттау /Итоговой аттестации/Final certification            |                                                                                                                                                                                                                                                                                                                                              |                             |                                                    |     |    |     |    |    |    |    |    |                                   |                                                                    |



## EXPERT OPINION

### on the Educational Program 7M06138 – «Information Systems» Research-Oriented Master's Degree Program of JSC «Kazakh University of Technology and Business»

The educational program (hereinafter referred to as the EP) **7M06138 – «Information Systems»**, implemented within the research-oriented master's degree track at JSC «Kazakh University of Technology and Business,” is a system of educational and methodological documents regulating the objectives, expected learning outcomes, content, conditions, and technologies of the educational process, as well as the quality assessment system for graduate training. The program complies with the regulatory and legal requirements of the Ministry of Science and Higher Education of the Republic of Kazakhstan.

The EP was developed and approved in accordance with the requirements of the State Mandatory Standards of Higher and Postgraduate Education (Order No. 2 of the Ministry of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022, with amendments and additions as of February 20, 2023), as well as on the basis of sectoral qualification frameworks.

The purpose of the educational program **7M06138 – «Information Systems»** is to train highly qualified specialists in the field of Information Systems; to develop competencies that enable professional activities in various application areas of information systems; to prepare specialists for research, development, implementation, and maintenance of information technologies and systems across different sectors of the economy; and to develop professional skills and competencies necessary for professional, scientific, and educational activities for the benefit of society.

The compulsory component of the professional educational program is aimed at developing managerial and communication competencies, including the ability to plan and organize teamwork using modern management approaches and business communication principles, as well as the ability to analyze and monitor the operational activities of organizational units.

The elective component of the educational program provides opportunities for expanding and deepening professional training and acquiring additional competencies, skills, and knowledge required to ensure graduates' competitiveness in accordance with labor market demands.

The implementation of the educational program is supported by qualified academic staff engaged in scientific and methodological activities. Teaching of professional disciplines is carried out by faculty members holding academic degrees and academic titles.

Theoretical and practical training within the educational program **7M06138 – «Information Systems»** is provided through the following modules:

- Basic Module;
- Intelligent Information Systems and Big Data Analytics;
- Control Systems and Artificial Intelligence;

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- Analysis and Mathematical Modeling.

Practical skills are developed through the course:

- **Machine Learning for Big Data Analytics.**

### **Competency Model**

The competency model of graduates of the educational program **7M06138 – «Information Systems»** consists of two major groups of competencies:

#### **1. Universal Competencies**

- General professional competencies;
- Socio-personal competencies;
- General cultural competencies.

#### **2. Professional Competencies**

- Analytical competencies;
- Design and development competencies;
- Production and technological competencies;
- Organizational and managerial competencies;
- Research competencies.

Professional competencies correspond to the fields and objectives of professional activity and include:

1. The ability to develop ICT utilization strategies in various subject domains and forecast potential trends in their development.
2. The ability to design information processes and systems using innovative technological tools.
3. Proficiency in modern information technologies for managerial decision-making and leadership, including planning, management, and control of project requirements; assessment of complexity, risks, budgets, and timelines; monitoring project schedules; and supporting information systems throughout their entire life cycle.
4. The ability to apply and further develop scientific research methods in the field of advanced technologies for the design and development of information systems in applied domains.

### **Conclusions of the Expert Review**

Based on the conducted review, the following conclusions can be drawn:

- The educational program submitted for review complies with the State Educational Standards of the Republic of Kazakhstan.
- The structural elements of the program are implemented in accordance with the competency-based approach.
- The curriculum disciplines logically reflect the content of the training profile **7M06138 – «Information Systems»**, taking interdisciplinary connections into account.
- Educational and methodological support includes course syllabi, course annotations, assessment materials, internship programs, and final state certification programs.
- The university and faculty environment provides favorable conditions for the development of graduates' general cultural competencies.

### **Recommendations for Improvement**

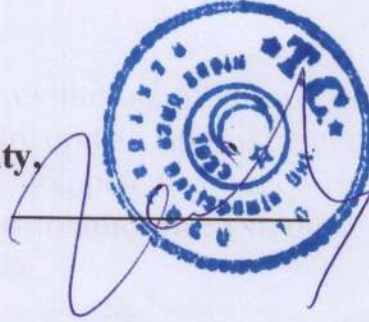
1

Considering the continuous evolution of information and communication technologies, it is recommended to update approximately **10% of the elective courses** in accordance with the competencies required of graduates of the educational program **7M06138 – «Information Systems»**, as well as current labor market needs and employer demands.

**Final Assessment**

- The educational program is recommended for implementation in the educational process.
- The structure and content of the educational program **7M06138 – «Information Systems»** are oriented toward meeting labor market and employer needs, correspond to similar master's programs within the European Higher Education Area, and enable the achievement of the intended learning outcomes.

Professor, PhD,  
Niğde Ömer Halisdemir University,  
Niğde, Türkiye



Nezih Önal

## ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ

на образовательную программу 7M06138 - «Информационные системы»  
профильного направления АО «Казахский университет технологии и бизнеса»

Образовательная программа 7M06138 «Информационные системы» профильного направления разработана в соответствии с требованиями Государственных общеобязательных стандартов высшего и послевузовского образования Республики Казахстан, отраслевых рамок квалификаций и современных требований рынка труда. Цель программы заключается в подготовке высококвалифицированных магистров, обладающих профессиональными компетенциями в области информационных систем, цифровых технологий и управления информационными ресурсами, способных эффективно решать практические задачи по проектированию, внедрению, сопровождению и развитию информационных систем в различных отраслях экономики. Содержание образовательной программы обеспечивает формирование компетенций в области проектирования и управления информационными системами, анализа данных, математического моделирования, применения технологий искусственного интеллекта и принятия управленческих решений. В структуру программы включены дисциплины, направленные на развитие аналитических, проектных, организационно-управленческих и профессионально-практических навыков обучающихся.

В рамках актуализации программы усилены дисциплины, отражающие современные тенденции развития информационных технологий, в том числе дисциплина «Машинное обучение для анализа больших данных», что способствует повышению конкурентоспособности выпускников и соответствует запросам работодателей и требованиям цифровой экономики.

Реализация образовательной программы обеспечивается квалифицированным профессорско-преподавательским составом, имеющим соответствующую научную и профессиональную подготовку, а также опыт научно-методической и практической деятельности.

Модель компетенций выпускника включает универсальные и профессиональные компетенции, охватывающие аналитическую, проектную, производственно-технологическую, организационно-управленческую и исследовательскую деятельность.

По результатам экспертизы установлено, что:

- образовательная программа соответствует требованиям ГОСО РК;
- структура и содержание программы реализованы на основе компетентностного подхода;
- дисциплины учебного плана отражают современные тенденции развития информационных систем и цифровых технологий;
- учебно-методическое обеспечение и кадровый потенциал позволяют обеспечить качественную подготовку магистров.

С целью дальнейшего совершенствования программы рекомендуется регулярно обновлять содержание элективных дисциплин с учетом развития информационно-коммуникационных технологий, потребностей рынка труда и требований работодателей.

**Вывод:** образовательная программа 7M06138 «Информационные системы» профильного направления рекомендуется к использованию в учебном процессе. Содержание программы соответствует современным требованиям рынка труда, обеспечивает достижение заявленных результатов обучения и способствует подготовке конкурентоспособных специалистов в области информационных систем и цифровых технологий.

директор

ООО «SPECTRE SECURITY GROUP»

ТУРИН М. М.



## ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ

на образовательную программу 7М06138 - «Информационные системы»  
профильного направления АО «Казахский университет технологии и бизнеса»

Образовательная программа 7М06138 «Информационные системы» профильного направления разработана в соответствии с требованиями ГОСО Республики Казахстан, отраслевых рамок квалификаций и современными потребностями рынка труда.

Цель программы — подготовка квалифицированных магистров, обладающих профессиональными компетенциями в области информационных систем, цифровых технологий и управления информационными ресурсами, способных решать практические задачи по проектированию, внедрению, сопровождению и развитию информационных систем.

Содержание программы направлено на формирование компетенций в области проектирования и управления информационными системами, анализа данных, математического моделирования и применения технологий искусственного интеллекта. Особое внимание уделено дисциплине «Машинное обучение для анализа больших данных», способствующей развитию навыков интеллектуального анализа и обработки данных.

По результатам экспертизы установлено, что образовательная программа соответствует требованиям ГОСО РК, основана на компетентностном подходе и отражает современные тенденции развития информационных технологий. Рекомендуется систематически актуализировать элективные дисциплины с учетом развития цифровых технологий и предложений работодателей.

**Вывод:** образовательная программа 7М06138 «Информационные системы» профильного направления рекомендуется к реализации и обеспечивает качественную подготовку конкурентоспособных специалистов в области информационных систем и цифровых технологий.

директор

ТОО «AI- TREND SCHOOL»



*T. T.* Махметов Т.З

## ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ

на образовательную программу 7М06138 - «Информационные системы»  
профильного направления АО «Казахский университет технологии и бизнеса»

ТОО «3D Club», осуществляющее деятельность в сфере робототехники и цифровых технологий, рассмотрело образовательную программу 7М06138 – «Информационные системы». Образовательная программа направлена на подготовку квалифицированных специалистов в области проектирования, разработки, внедрения и сопровождения информационных систем и современных цифровых технологий.

Содержание образовательной программы соответствует требованиям Государственного общеобязательного стандарта высшего и послевузовского образования Республики Казахстан и современным потребностям рынка труда в сфере информационных технологий.

Особую практическую значимость представляют дисциплины, связанные с интеллектуальными информационными системами, анализом данных, машинным обучением, математическим моделированием и управлением информационными системами.

Выпускники программы обладают компетенциями в области разработки информационных систем, анализа данных, проектирования программных решений, применения современных информационных технологий и управления IT-проектами.

По результатам проведённой экспертизы установлено, что:

- структура образовательной программы соответствует современным требованиям высшего образования;
- содержание дисциплин обеспечивает формирование профессиональных компетенций, востребованных работодателями;
- образовательная программа ориентирована на практическую подготовку специалистов в области информационных технологий;
- результаты обучения соответствуют потребностям цифровой экономики и IT-отрасли.

Рекомендуется продолжить актуализацию элективных дисциплин с учётом современных тенденций развития искусственного интеллекта, анализа данных и цифровых технологий.

Вывод: Образовательная программа 7М06138 – «Информационные системы» соответствует требованиям рынка труда и рекомендуется к дальнейшей реализации в образовательном процессе.

Руководитель ТОО «3D club»



И.Н.Курмангожин

Дата: 22. 06.2026г

**«Қазақ технология және бизнес университеті» АҚ-ның 7М06138 – «Ақпараттық жүйелер» бейіндік бағытындағы білім беру бағдарламасына**

**САРАПТАМАЛЫҚ ҚОРЫТЫНДЫ**

7М06138 «Ақпараттық жүйелер» бейіндік бағыттағы білім беру бағдарламасы Қазақстан Республикасының жоғары және жоғары оқу орнынан кейінгі білім берудің мемлекеттік жалпыға міндетті стандарттарының, салалық біліктілік шеңберлерінің талаптарын, сондай-ақ цифрлық экономиканың өзекті даму үрдістері мен қазіргі еңбек нарығының қажеттіліктерін ескере отырып әзірленген.

Білім беру бағдарламасының мақсаты ақпараттық жүйелер, цифрлық технологиялар және ақпараттық ресурстарды басқару саласында кәсіби құзыреттерді меңгерген білікті магистрлерді даярлауға бағытталған. Бағдарлама түлектері кәсіби қызметтің әртүрлі салаларында ақпараттық жүйелерді жобалау, енгізу, пайдалану, сүйемелдеу және жаңғыртуға байланысты қолданбалы міндеттерді шешуге қабілетті.

Бағдарламаның мазмұны ақпараттық жүйелерді жобалау және басқару, деректерді өңдеу және талдау, математикалық модельдеу, жасанды интеллект әдістерін қолдану және тиімді басқарушылық шешімдер қабылдау салаларындағы құзыреттерді қалыптастыруды көздейді. Оқу жоспарының пәндері білім алушылардың аналитикалық, жобалық, ұйымдастырушылық-басқарушылық және кәсіби-практикалық дағдыларын дамытуға ықпал етеді.

Бағдарламаны өзектендіру барысында ақпараттық технологиялардың заманауи бағыттарына ерекше назар аударылған. Атап айтқанда, «Үлкен деректерді талдауға арналған машиналық оқыту» пәнінің мазмұны күшейтілді. Бұл деректерді өңдеудің интеллектуалдық әдістерін қолдану дағдыларын қалыптастыруға және түлектердің еңбек нарығындағы бәсекеге қабілеттілігін арттыруға мүмкіндік береді.

Бағдарламаны іске асыру қажетті кәсіби даярлығы, ғылыми-әдістемелік және практикалық қызмет тәжірибесі бар білікті профессор-оқытушылар құрамымен қамтамасыз етіледі.

Түлек моделі аналитикалық, жобалық, өндірістік-технологиялық, ұйымдастырушылық-басқарушылық және зерттеушілік қызметті жүзеге асыруға қажетті әмбебап және кәсіби құзыреттерді қамтиды.

Сараптама нәтижелері бойынша бағдарламаның ҚР МЖМБС талаптарына сәйкес келетіні, құзыреттілік тәсіл негізінде құрылғаны, мазмұнының өзектілігі және қажетті оқу-әдістемелік қамтамасыз етілуі анықталды.

Бағдарламаны одан әрі жетілдіру мақсатында элективті пәндердің мазмұнын цифрлық технологиялардың дамуы мен жұмыс берушілердің сұраныстарын ескере отырып жүйелі түрде жаңарту ұсынылады.

Қорытынды: 7М06138 «Ақпараттық жүйелер» бейіндік бағыттағы білім беру бағдарламасы оқу үдерісінде іске асыруға ұсынылады және ақпараттық жүйелер мен цифрлық технологиялар саласында бәсекеге қабілетті мамандарды даярлауды қамтамасыз етеді.

**«Батырбол» ЖШС-нің директоры**

