

AGREED

by the Chairman of Educational and
Methodological Council JSC «International
University of Information Technologies»

Mustafina A.K.

2023

APPROVE

Chairman of the Board - Rector
JSC «International University of
Information Technologies»

Ilikmetov A.K.

2023



EDUCATIONAL PROGRAM

7M06103 Business-analysis

Code and classification of the field of education: 7M06 Information and communication technologies

Code and classification of areas of study: 7M061 Information and Communication Technologies

Group of educational programs: M094 Information technology

ISCED level: 7

NQF level: 7

ORC level: 7

Duration of study: 2 years

Credits: 120

AGREED

QAZTEX Innovations, LLP

Deputy Director



2023

AGREED

IT Dev Group, LLP

Director



2023

Almaty, 2023

Educational program 7M06103 Business-analysis is the main academic document of the university for training in the direction of " Information and Communication Technologies" for the 7th level of qualification (master's degree).

This educational program was discussed and approved at the meeting of the department of Information Systems dated "07" 02 2023 Protocol No. 3

Head(s) of the department



Kozhamzharova D.Kh.

This educational program was reviewed and approved at a meeting of the University CC dated March 30, 2023 Protocol No. 8

Head of Department

for educational and methodological activities



Adzhibaeva A.Sh.

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List of abbreviations and symbols

ANPC	Atlas of new professions and competencies
BC	Basic competence
ICT	Info-communication technologies
AI	Artificial intelligence
IS	Information systems
IT	Information Technology
QC	Quantum Computing
ISCE	International Standard Classification of Education
RW	Research work
NQF	National Qualifications Framework
NQS	National Qualifications System
EP	Educational program
GPM	General professional module
SQF	Sectoral Qualifications Framework
PS	Professional Standard
PE	Postgraduate Education
PC	Professional competence
PM	Professional module
WG	Working Group
RK	Republic of Kazakhstan
LO	Learning Outcome
RS	Regional standard

1. Description of the educational program

This educational program (EP) was developed on the basis of professional standards (PS) of the National Chamber of Entrepreneurs "Atameken", the National Qualifications Framework (NQF), the Sectoral Qualifications Framework (SQF) in the field of information technology and regional standards (RS) of education, based on research and trends indicated in the Atlas of new professions and competencies (ANPC) of Kazakhstan in the field of information technology.

The latest advances in information technology have made it possible for organizations, enterprises, institutions, government agencies and businesses to accumulate large amounts of data. Business analytics are modern methods and tools for extracting useful information from large volumes of data in order to deeply understand and optimize business processes and make the best management decisions. Using models and methods for extracting knowledge from data, a business analyst is able to analyze all available solutions in difficult situations, predict and evaluate the possible consequences and risks of their implementation, and develop recommendations for decision makers. Business analysis, as a discipline, is closely related to requirements analysis, but focuses on identifying the changes for an organization that are required in order for the organization to achieve its strategic goals. These changes include changes in strategy, structure, policies, processes and information systems. Business analysis, as a modern trend in higher professional education of a new generation, substantiates the innovative aspects of the master's program in business analysis, which form the most important qualification characteristics of modern demanded business analyst professions.

One of the key specialists in the field of IT is a business analyst. Today, the labor market is in demand for specialists who are able to work in the field of business analysis of multidimensional data of a complex structure, in the field of managing enterprise business processes and making effective management decisions based on data analysis.

The main competitive advantages of the EP "Business Analytics" can be called the following: 1) that it is focused on the needs of modern personnel policy in the field of business analysis; 2) in demand in the market of educational services due to the relevance, novelty and insufficiency of educational programs for the training of business analysts; 3) the professional cycle of disciplines has a customizable block for the choice of undergraduates, which maximally takes into account their interests in certain areas of analytical activity, and the program also provides start-up intellectual capital for academic and scientific careers.

The convergence of EP directions is ensured through the optimal combination of disciplines in a balanced curriculum, which provides a set of knowledge necessary for successful professional activity in the field of business analysis in the context of digitalization.

A Master in Business Analytics will have a unique set of competencies that are in demand in any modern enterprise: know modern methods and technologies of data mining; be able to apply them in the analysis and design of the organization's business processes, providing analytical support for decision-making processes; own data mining and business intelligence tools for modeling digital business, and increasing the efficiency of its functioning and development.

Graduates can work in enterprises and organizations of any form of ownership in various market segments as IT managers, business analysts, architects of information systems and IT business, heads of areas and business projects. Masters in the direction of training "Business Analysis" can realize themselves in most applied areas related to the use of IT competencies, including in the scientific field related to the use of mathematical methods and tools.

2. Purpose and objectives of the educational program

The purpose of the EP is to provide research training for masters in the field of business analysis of business processes and / or ICT projects of an organization in accordance with the requirements of the new information society.

Objectives of the EP: to equip students with the theoretical knowledge and practical skills necessary for:

- 1) formation of ideas about the role and place of business analysis in the activities of the enterprise;
- 2) application of cognitive models of data analysis for making effective management decisions;
- 3) use of business intelligence tools and platforms;
- 4) modeling and optimization of business processes and / or ICT projects of the organization,
- 5) formation of skills in the development of data analysis models;
- 6) management of IT projects and processes in the development of information systems based on business analysis.
- 7) possession of systemic thinking, customer focus, have the skills of inter-industry communication.

3. Requirements for evaluating the learning outcomes of an educational program

The following forms of exams are used as an assessment of learning outcomes: computer testing, written exam (answers on sheets), oral exam, project (passing a course project), practical (open questions on a computer, solving problems on a computer), complex (test / written / oral + others). In accordance with table 1, the following ratio of exam forms is recommended:

Table 1

No.	Exam form	Recommended share, %
1	Computer testing	5%
2	Writing	80 %
3	Oral	5%
4	Project	5 %
5	Practical	0%
6	Complex	5%

The final attestation of students is carried out within the terms provided by the academic calendar and the working curriculum of the EP in the form of dissertation defense.

4 Passport of the educational program

4.1 General information

No	Field name	Note
1	Code and classification of the field of education	7M06 Information and Communication Technologies
2	Code and classification of areas of study	7M061 Information and Communication Technology
3	Group of educational programs	M094 Information technology
4	Name of the educational program	7M06103 Business-analysis
5	Brief description of the educational program	The main competitive advantages of the EP Business analysis can be called the following: 1) that it is focused on the needs of modern personnel policy in the field of business analysis; 2) in demand in the market of educational services due to the relevance, novelty and insufficiency of educational programs for the training of business analysts; 3) the professional cycle of disciplines has a customizable block for the choice of undergraduates, which maximally takes into account their interests in certain areas of analytical activity, and the program also provides start-up intellectual capital for academic and scientific careers.

6	Purpose of the EP	provide research training for masters in the field of business analysis of business processes and / or ICT projects of the organization in accordance with the requirements of the new information society.
7	ISCED level	7
8	NQF level	7
9	ORC level	7
10	<p>List of competencies of the educational program:</p> <p>BC1: The ability to independently master new knowledge and skills, learn new methods of scientific research and use them in practice, including in new areas of knowledge that are not directly related to the field of activity.</p> <p>BC2: The ability to constructively and creatively interact in the process of interpersonal and business communication, to freely use Kazakh, Russian and English languages in the design, presentation and discussion of the results of professional activity,</p> <p>BC3: Ability to put into practice the skills and abilities of organizing research and design work and managing a team; be able to take initiative, take full responsibility; evaluate performance.</p> <p>BC4: The ability to analyze and critically evaluate modern scientific achievements and socially significant problems, to use modern methods of solving them in practice.</p> <p>BC5: The ability to carry out the formulation and conduct of experiments according to a given methodology; analyze the results of experiments using information and communication technologies, select the best solutions, prepare and compile reviews, reports and scientific publications.</p> <p>PC1: The ability to formulate and solve problems that arise in the course of scientific research and require deep professional knowledge; choose the necessary research methods, modify existing ones and develop new methods based on the research objectives.</p> <p>PC2: The ability to manage the business processes of an enterprise, analyze business processes and models, justify ways to optimize them and innovative development of the organization</p> <p>PC3: The ability to apply the methods of system analysis, modeling and design of information systems, to independently solve research problems in the field of business process management</p> <p>PC4 : The ability to apply methods for building, analyzing and applying models to assess the state and forecast the development of business processes, analyze the enterprise architecture, apply business object management methods, and develop business strategies for the organization.</p> <p>PC 5: Ability to manage the stages of the life cycle of the methodological and technological infrastructure of big data analysis in the organization, analyze, evaluate and apply methods and tools for predictive modeling.</p> <p>PC6: The ability to conduct a pre-project survey of the design object, a system analysis of the subject area, their relationships, conduct technical design, apply technologies and tools for developing the IS architecture.</p> <p>PC7: The ability to apply modern approaches to solving problems of business analysis, data mining and machine learning, to be able to choose an adequate model for the problem being solved and justify its effectiveness.</p> <p>PC8 : Determination of the organizational structure of the project, the ability to manage IT projects, manage the risks of an IT project, choose the methodology and technology for designing IS taking into account project risks, manage projects for informatization of applied tasks and the creation of IS for enterprises and organizations.</p>	

11	<p>Learning outcomes of the educational program:</p> <p>LO1: Formulate and solve problems that arise in the course of research, develop and master methods of scientific research, master the skills of conducting independent research activities.</p> <p>LO2: Apply modern methods and techniques of teaching analytical disciplines in higher educational institutions, apply psychological knowledge in practical work for the optimal creation and development of a system of interaction with students.</p> <p>LO3: Analyze, interpret and synthesize information when drawing up, presenting and discussing the results of professional activities, structure and present in the form of analytical reports with reasonable conclusions and recommendations .</p> <p>LO4: Conduct a systematic analysis of the subject area of research, choose rational methods for conducting business analysis, analyze, evaluate and predict the state of the situation in the organization using analytical platforms and tools.</p> <p>LO5: Be able to use information systems modeling methods, develop requirements for them, have skills in using modern tools used in various phases of analysis and design of information systems architecture.</p> <p>LO6: Critically evaluate and adapt to modern conditions the scientific results obtained by domestic and foreign researchers in the field of business analysis.</p> <p>LO7: Organize and plan analytical work, use the results of the analysis in business management, manage the preparation and implementation of innovative projects, develop options for management decisions and analytically justify their choice.</p> <p>LO8: Classify IT risks, manage the quality and risks of IT projects and optimize the IT risk management process, apply relationship management standards and practices, in particular the psychology of negotiation and conflict management.</p> <p>LO9: Process experimental and statistical data, develop skills to establish the adequacy of mathematical models of business processes, use formalization methods and decision-making methods, justify decisions in business analysis.</p> <p>LO10: Apply data mining technologies to solve specific practical business analysis problems, use the capabilities of universal software tools and analytical platforms to search for patterns, relationships, rules, knowledge in an electronic data set.</p> <p>LO11: Be able to use tools for improving business processes, apply methods for analyzing and optimizing business processes, master the methodology of scientific research in the field of business process management, identify key issues in the organization's business strategies.</p> <p>LO12: Study and analyze patterns of human thinking and behavior, calculate the probabilities of success for teams, predict outcomes, apply better strategies and make decisions.</p> <p>LO 13: Be able to work with a database, have deep knowledge in the field of database design, which allows you to properly organize data. Collect and place data on graphs, charts and other visualization tools to find trends and patterns.</p>	
12	Form of study	full-time
13	Language of instruction	English
14	Volume of loans	120
15	Awarded Academic Degree	master of technical sciences in the educational program 7M06103 " Business" analytics " (Business Analytics)
16	Professional standards of the National Chamber of Entrepreneurs "Atameken"	58. Business intelligence and IT project management (version 1, 2018) 27. Business analysis in information and communication technologies (version 2, 2022) 277. Holding web monitoring (version 2, 2022)
17	Developer(s) and authors:	JSC "International University of Information Technologies", Department of Information Systems: - Sembina G.K., Candidate of Technical Sciences, Associate Professor.

		- Kabdushev Sh.B., senior lecturer - Kozhamzharova D.Kh., Head of IS Department
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4.2 Matrix of correlating the learning outcomes of the educational program as a whole with the competencies being formed

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12	LO13
BC1	V												
BC2		V	V										
BC3		V					V					V	
BC4				V		V							
BC5			V		V								
PC1						V							
PC2										V	V		
PC3							V				V		
PC4			V				V	V	V		V		
PC5				V			V			V			V
PC6					V								
PC7			V				V			V			V
PC8								V					

4.3 Information about modules / disciplines (if there are modules, it is necessary to highlight them)

N o.	Name of the discipline	Brief description of the discipline (30-50 words)	Number of credits	Formed competencies (codes)	Bickering visits
Cycle of basic disciplines					
University Component/Elective Component					
1.	History and philosophy of science	The main historical periods of the emergence and development of scientific knowledge, as well as the philosophical analysis of the phenomenon of science are investigated. We study the intellectual activity of scientists and thinkers who, in the process of long searches and accumulation of knowledge about the surrounding reality, tried to distinguish certain regularities in nature, some deep expediency and natural beauty.	4	BC1	No
2.	Foreign language (professional)	Students will become familiar with the processes of activity and sequence of procedures that are central to research: in particular, how to define the scope and topic of research, how to conduct	4	BC2	No

		research, how to work with various databases and data sources. During the course, undergraduates will work on one project.			
3.	Pedagogy of higher education	Modern tendencies of humanization and democratization of the teaching and upbringing process in higher education, new technologies of teaching and upbringing, orients on the individual creative style of pedagogical activity. The content of this course is focused on equipping undergraduates with knowledge of the patterns, principles, content, forms and methods of higher education in the context of its modernization.	4	BC1, BC2, BC3	No
4.	Psychology of management	Acquaintance with modern interpretations of the subject and the main categories of psychological science; psychological control mechanisms and patterns of interpersonal interaction in the conditions of professional activity; substantiation of the relevance of psychological knowledge in solving practical issues in human life; development of systemic, creative thinking of the future specialist, research culture and the need for continuous self-education and self-development.	4	BC2, BC3	No
5.	Teaching practice	The practice is aimed at consolidating, expanding, deepening and systematizing knowledge on the methodology of teaching special and professional disciplines. The theoretical foundations and regularities of the functioning of reforms in the field of education and science, legislative and regulatory legal acts that carry out the activities of educational institutions are being studied; principles of making and implementing	4	BC1, BC2, BC3	Pedagogy of higher education

		pedagogical and managerial decisions.			
6.	Mathematical foundations of decision making	Linear, non-linear and dynamic economic-mathematical models in business analysis and IT project management and their solution algorithms are investigated. Linear models contain simplex methods, methods for solving transport and logistics problems and industrial production; methods for combinatorial optimization of scheduling, routing, packaging, service provision problems, and others.	5	BC5, PC4	Mathematical analysis, Probability theory and mathematical statistics
7.	Mathematical programming	Linear programming problems, construction of basic plans, simplex methods, artificial basis method, general transportation problem, convex programming problems, optimization of dynamic systems, dynamic programming methods are studied.	5	BC5, PC4	Mathematical analysis, Probability theory and mathematical statistics
8.	Creative thinking modeling	Introduction to probability theory, Markov processes, Lyapunov function, learning models, replicator dynamics and other interesting models that will help you make better decisions and apply more effective strategies. Probability models improve the ability to make accurate predictions. They help you make better decisions and apply more effective strategies.	5	BC3	Probability theory and mathematical statistics
9.	Application of mathematics and statistics in IT	The course serves as a base class for scientific computing and is designed to teach if you are pursuing a career in computing and engineering. Students will learn how computational methods are created and how they are used to solve problems that arise in science and engineering. Matlab environment and solution	5	BC3	Probability theory and mathematical statistics

		of equations. Linear algebra. Functions and data. Differential equations. Nonlinear systems.			
10	Analysis and processing of unstructured data	MapReduce methods for parallel processing and Hadoop , an open source environment that allows cheap and efficient implementation of MapReduce in Internet tasks, are considered. Text analysis systems. Methods for preprocessing text mining. Natural language processing. Search for information. Visual recognition and tracking in large sets of images and video data.	4	BC5 , PC5	Introduction to Machine Learning
11	Cloud computing for big data analytics	Acquisition of knowledge in the field of data warehouses, study of modern Big Data technologies; SQL programming language for big data analytics and cloud technologies for big data processing.	4	BC5 , PC5	Introduction to Machine Learning
Cycle of major disciplines University Component/Elective Component					
12	IT and strategic management methods in the project	In the process of studying the course, undergraduates will master effective methods and tools of production management in order to ensure sustainable competitiveness in the long term in the face of constant changes in the business environment. Also, undergraduates will study the basics of conducting investment analysis in the process of introducing innovations, as well as finding effective sources of financing, including banks, the public sector, etc.	4	PC5, PC7	IT project management

13	Econometric Information Technology	This discipline studies the main types, features of functioning and scope of econometric modeling of processes, provides a detailed overview and description of the most important methods of statistical processing of various data, as well as a practical interpretation of the results obtained .	4		Math statistics
14	Project communication management	They are studied to classify projects , to measure the successes and failures of the project. Stages of the project management process. Project manager. Organizational structures of the project. Types of project analysis. Project Human Resource Management. Project communications management.	5	BC3, PC 8	Psychology
15	Intelligent methods of managing IS and projects	The study of the discipline is aimed at preparing undergraduates to solve practical problems of data processing using modern intellectual methods for solving problems . Supervised Machine Learning: Regression. Data separation and cross-validation. Supervised Machine Learning: Classification. logistic regression. nearest neighbors. Support vector machines. Decision trees Ensemble models. Unsupervised machine learning.	5	BC3, PC 8	Psychology
16	Decision support systems	The problem statement, typical stages, approaches to modeling decision-making conditions, as well as the consequences of choosing various options are studied . The features of making group decisions are highlighted. Approaches to modeling problem situations that characterize possible states of the external	5	BC3, PC7	Creative thinking modeling, Project communication management

		environment in the future are considered.			
17	IS Modeling and Design	Acquaintance with modern methods of information systems (IS) design: requirements formation, conceptual design, application specification, model development, information system integration and testing. The study of the discipline gives knowledge about the methodology of structural systems analysis and design; technologies, standards and design tools for information systems of various subject areas, IS data models.	5	BC3, PC7	Creative thinking modeling, Project communication management
18	Project quality and risk management	place and role of risk management in project management are studied . Organization of the risk management system. Management of risks. Price risks. Operational risks. Investment risks. Analysis methods and project risk assessment indicators.	4	PC8	Creative thinking modeling, Project communication management
19	IT project management	The discipline is devoted to the theoretical and practical study of project management. Practical classes are devoted to the organization of project management documents as a means of communication between members of the project team. Project Management, Best Practices, Project Planning, Cost Estimation, Project Integration, Work Distribution Structure, Project Resource Management, Project Coordination, Risk Management, Project Critical Success Factors, Agile Project Management , Scrum , Kanban .	4	PC8	Creative thinking modeling, Project communication management
20	Scientific research methods	The course involves research work aimed at developing the ability of undergraduates to make independent theoretical and practical judgments and conclusions,	4	BC1, BC4, PC1	No

		the skills of an objective assessment of scientific information, the freedom of scientific research and the desire to apply scientific knowledge in professional activities.			
21	Business Process Management	Theoretical foundations of business process management are studied . Theories of process management. Life cycle of business process management. Models and tools used to describe business processes. Analysis of business processes. Classification of business process analysis methods. Qualitative analysis of business processes. Quantitative analysis of business processes . Structuring method. Automation of business processes.	5	PC2, PC3	Modeling and analysis of business processes
22	Business Intelligence	Methods and technologies of Business Intelligence, methods of building decision support systems, multivariate analysis methodologies, tools for Business Intelligence, technologies for linguistic analysis of business information are studied.	5	PC5, PC6, PC7	Machine learning methods
23	Business analytics	We study the basic principles, features, methods and models, platforms and business analysis tools , methods for discovering new knowledge in data warehouses, the basic concepts of Business Intelligence, evaluating the effectiveness of business intelligence systems. The tasks of analysis, visualization and interpretation are provided using statistical data analysis programs, analytical platforms and tools.	5	PC5, PC6, PC7	Business Intelligence
24	Analysis and design of information systems architecture	The architecture of information systems is being studied. Variants of information systems architectures. Design of	4	PC6	IS architecture

		information systems. Statement of requirements for IS architecture. Development of technical specifications for the design of information systems. Methodology for designing the architecture of information systems.			
25	Tools and platforms for building predictive models	The methodological foundations of forecasting, organization of forecasting processes, classification (typing) of forecasts, forecasting models and methods, functional forecasts, corporate forecasting methodology are studied.	4	PC5, PC7	Business Intelligence, Machine Learning Methods
26	Technologies and tools for data analysis	This discipline studies the basic principles, features, technologies, methods, models, platforms and tools for data analysis, methods for discovering new knowledge in data warehouses, the basic concepts of Business Intelligence. The discipline consists of theoretical and practical parts. The practical part provides for the implementation of the tasks of analyzing, visualizing and interpreting data in various subject areas using statistical data analysis programs and Business Intelligence methods, analytical platforms and tools.	4	PC5, PC7	Business Intelligence, Machine Learning Methods
27	Research practice	Experience is gained in the study of an actual scientific problem, information sources on the topic being developed, methods of modeling and research of information processes are studied; methods of analysis and processing of static data; information technologies used in scientific research, software products related to the professional field; requirements for the design of scientific and technical documentation.	8	BC5, PC1	Research Methodology

17



[illegible]

[illegible]

Total PD practice		8	3	240																
II . Research work																				
RW7001	Research work of a master student, including an internship and a master's thesis (RWoMS)	2	1	60																8
RW7002	Research work of a master student, including an internship and a master's thesis(RWoMS)	3	2	90																
RW7003	Research work of a master student, including an internship and a master's thesis (RWoMS)	5	3	150														3		
RW7008	Research work of a master student, including an internship and a master's thesis (RWoMS)	14	4	420															5	
	Total RWoMS	24		720																14
I.	Total theoretical training																			
II.	Final examination:	112		3360	630	255	475					1650	255	1395	35	25	30			14
	Registration and defense of a master's thesis (RDoMT)																			
	Total FA	8	4	240										360	90					
		8		240										360	90					8
I+II+III	TOTAL	120		3600	645	255	390					2025	345	1680	35	25	30			30

6. List of approval with the developers

Name of the educational program: 7M06103 Business-analysis

No. p / p	Position, scientific or academic degree and Surname I.O. educational program developer	Date	Signature	Note
1	Associate Professor of the Department of Information Systems, Ph.D., Associate Professor Sembina Gulbakyt Kakeyevna	07.02 2023		
2	Senior lecturer of the Department of Information Systems, Kabdushev Sherniyaz Bulatuly	07.02 2023		
3	Head of the Department of Information Systems, Kozhamzharova Dinara Khanatovna	07.02. 2023	