

AGREED

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



Mustafina A.

«12» December 2024 Protocol of the EMC № 3

APPROVED

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



Issakhov A.

«28» February 2025 Protocol of the AC № 10

EDUCATIONAL PROGRAM

6B06105 Information systems

Code and classification of the field of education: 6B06 Information and
Communication Technologies

Code and classification of training area: 6B061 Information and Communication Technologies

Group of educational programs: B057 Information Technologies

ISCED level: 6

NQR level: 6

ORC level: 6

Academic degree awarded: Bachelor of Science in Information and Communication Technologies,
Educational Program «6B06105 Information Systems»

Duration of study: 4 years

Number of credits: 240

AGREED

“KADEEN” LLP



Director Daniyarov Zh.

2025

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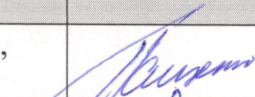
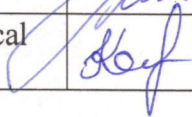
“Zerone Technology” LLP



Director Rashidinov D.

2025

The code and name of the educational program: 6B06105 «Information systems»

№	Educational program developers (Position, scientific degree, academic degree, Full name)	Signature
1	Associate Professor of the Department of Information Systems, Ph.D., Associate Professor Pashchenko Galina Nikolaevna	
2	Lecturer of the Department of Information Systems, Master of technical sciences Kopzhassarova Maira Azimbekkyzy	

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List of abbreviations and acronyms

BD	Cycle of basic disciplines
BC	Basic competency
BM	Basic module
UC	University component
HE	Higher education
NMS	National Mandatory Standards of Higher and Post-Graduate Education
ATT	Additional types of training
EQF	European qualifications framework
EFE	European foundation for education
KSA	Knowledge, Skills and Abilities
FA	Final attestation
EC	Elective component
ISCED	International Standard Classification of Education
NQF	National qualifications framework
NQS	National qualifications system
GHM	General humanitarian module
RC	Required component
GEM	General education module
GED	Cycle of general education disciplines
EP	Educational program
GPM	General professional module
SQF	Sectoral qualifications framework
GEC	General education competency
MD	Cycle of major disciplines
PI	Professional internship
PS	Professional standard
PE	Postgraduate education
PC	Professional competency
PM	Professional module
LO	Learning outcome
QMS	Quality Management System

1. Description of the educational program

The educational program "6B06105 – Information Systems" is aimed at training highly qualified professionals without category, as well as second- and first-category professionals of higher qualification levels. To achieve this goal, a number of tasks must be carried out, including targeted actions by the student body and specialized theoretical and practical training during the educational process, focused on meeting the needs of modern employers.

Upon graduation, the student is awarded the academic degree of "Bachelor in the field of Information and Communication Technologies" under the educational program 6B06105 "Information Systems."

Information Systems is a field of science and technology that encompasses a set of tools, methods, and techniques aimed at the development and use of systems for the collection, representation, storage, transmission, and processing of information.

The core educational program for bachelor's training in the specialty "6B06105 – Information Systems" is developed in accordance with the current state educational standard and includes a curriculum, academic discipline programs, teaching practice programs, and industrial (production) practice.

The professional activities of graduates are focused on enterprises and organizations of various forms of ownership that develop, implement, and profit from information systems across different fields of activity.

2. Aim and objectives of the educational program

The purpose (goals) of the Bachelor's degree program in the field of IS is high-quality training of specialists in the field of information systems, including software, hardware, information, legal and management support for the development and maintenance of information systems and having competencies that allow using the acquired fundamental knowledge, modern information technologies and software tools in solving professional tasks.

The objectives of the Information Systems educational program are to develop students' abilities to:

1. Analyze socially significant issues and processes, and apply methods of humanities, environmental, social, economic, and legal sciences in various types of professional and social activities.
2. Communicate fluently in Kazakh, Russian, and foreign languages as a means of professional communication.
3. Independently acquire and apply new knowledge and skills using information technologies, including in new areas of knowledge not directly related to their field of activity.
4. Professionally operate modern equipment, devices, network components, and computer systems.
5. Apply methods of physical education and health promotion, and achieve an adequate level of physical fitness to ensure effective social and professional activity.
6. Provide mathematical justification for problem formulation, use mathematical modeling to describe components of information systems, conduct mathematical analysis, and apply mathematical tools in the development of information systems.
7. Develop technical specifications for information system development, define quality criteria for information systems, formulate technical, software, and informational requirements, and model functional, informational, software, and hardware components of information systems using standard computer-aided design and research tools.
8. Design information and software systems based on modern development methods and tools.
9. Provide technical and methodological support for the design, implementation, and maintenance of information systems and technologies; organize interaction between developer and customer teams, and make managerial decisions in the context of differing opinions.

3. Passport of the academic program

№	Name	Description
1.	Education area code and classification	6B06 Information and Communication Technologies
2.	Training direction code and classification	6B061 Information and Communication Technologies
3.	Group of academic programs	B057 Information Technologies
4.	Name of the educational program	6B06105 Information systems
5.	Aim of the educational program	The purpose (goals) of the Bachelor's degree program in the field of IS is high-quality training of specialists in the field of information systems, including software, hardware, information, legal and management support for the development and maintenance of information systems and having competencies that allow using the acquired fundamental knowledge, modern information technologies and software tools in solving professional tasks.
6.	Type of the educational program	New EP
7.	Level according to the National Classifications Framework	6
8.	Level according to the Sectoral Qualifications Framework	6
9.	Distinctive features of the program	Two-degree program
10.	Partner University	University of Applied Sciences Hof
11.	Academic degree awarded	Bachelor
12.	Duration of study	4
13.	Volume of credits	240
14.	Language of education	English
15.	Atlas of new professions	https://atlasbt.enbek.kz/profession/422 https://atlasbt.enbek.kz/profession/57 https://atlasbt.enbek.kz/profession/73
16.	Regional standard	Not Provided
17.	Availability of an attachment to the training license	Included
18.	License number for the training area	KZ81LAM00001263
19.	Availability of program accreditation	Included
20.	Generated learning outcomes	LO1 - To design database architectures of information systems. LO2 - To carry out technical design of information systems. LO3 - To ensure the security and integrity of information systems and technologies. LO4 - To use software, hardware, information, mathematical, functional support of information systems for software modernization, the formation of sections of the terms of reference for the design of IT-infrastructure, improvement of program modules, data processing for automated systems, design and development of front-end and back-end web resources and descriptions of information and mathematical models. LO5 - To develop information systems and their components in various subject areas for solving

		<p>practical scientific and technical problems using modern ICT and IT project management methods, using modern technologies such as 3D modeling, IoT, VR/AR technologies and others as tools.</p> <p>LO6 - To argue the choice of basic standards, principles and design patterns, methods, tools and programming languages for the development of information systems.</p> <p>LO7 teamwork, knowledge of the principles and methods of organization and management of small teams.</p> <p>LO8 - To use mathematical methods of processing, analysis and synthesis of professional research results in the development of information systems and use information and communication technologies in the field of e-commerce, financial accounting and business processes.</p> <p>LO9 - To be able to apply the acquired knowledge in the chosen additional educational program.</p>
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4. Professional standards (PS), profession cards, labor functions

No.	PS name	Profession card	Labor functions
1	Computer systems infrastructure	IT Infrastructure Architect	Design of IT infrastructure and its implementation
2	Software support	Software Maintenance Specialist	Participation in software modernization
3	Development of graphic and multimedia design	Multimedia design	Development of a project structure with multimedia elements
4	Software testing	Software Engineer	Writing code and developing programs for software
5	Computer Systems Architecture Management	Information Systems Architect	Creation of IS architecture

5. List of the EP competencies

GEC1: Knowledge of socio-ethical values based on public opinion, traditions, customs, and social norms, and the ability to adhere to them in professional activity; knowledge of the traditions and culture of the peoples of Kazakhstan; human and civil rights and freedoms; fundamentals of the legal system and legislation of Kazakhstan; societal development; basics of physical culture and principles of a healthy lifestyle.

GEC2: Understanding of social and spiritual values; sociological approaches to personality; key rules and forms of behavior regulation; the origins of state authority and political life; financial relations and processes; functioning of financial systems in society and among social groups; the role of consciousness and self-awareness in behavior, communication, and activity; personal development and self-care.

GEC3: Ability to follow ethical and legal standards of conduct; mastery of practical skills and knowledge aimed at development, improvement, and optimization of psychophysical abilities and qualities; maintaining and promoting health; ability to work in a team, defend one's opinion respectfully, and propose new solutions.

GEC4: Ability to communicate in written and oral form in the state language and the language of interethnic communication; capacity for logical, clear, and reasoned speech; readiness to use a foreign language.

GEC5: Ability to use modern information technologies, manage information using business application software; apply networking technologies, databases, and domain-specific software tools.

BC1: Ability to use the state language, interethnic communication language, and a foreign language in professional activities.

BC2: Ability to understand the fundamentals of economic knowledge, finance, and economics.

BC3: Ability to operate modern equipment, devices, components, and network systems (as required by the curriculum); compliance with occupational safety, industrial hygiene, fire safety, and labor protection standards.

BC4: Proficiency in using algorithms and programming tools.

BC5: Ability to competently choose methods of mathematical modeling to solve specific engineering problems such as IT infrastructure design and implementation; software requirement analysis; software design; systems management; creation/modification of web resources; technical documentation development; and scientific and technical problem-solving, including applying scientific IT methods to identify and resolve challenges.

BC6: Ability to independently acquire and apply new knowledge and skills using information technology, including in new areas not directly related to one's field.

PC1: Ability to develop technical specifications for information system design, define quality criteria, and formulate technical, software, and informational requirements.

PC2: Ability to model the functional, informational, software, and hardware components of an information system using standard design and research tools; develop database models and algorithms.

PC3: Ability to design the component structure of information systems, including human-machine interfaces, hardware-software complexes, operating systems, and information security methods.

PC4: Ability to develop information and software components of information systems using modern methods and tools.

PC5: Ability to provide authorial support for the design, implementation, and maintenance of information systems and technologies; organize communication between developer and client teams; and make management decisions under varying opinions.

PC6: Ability to apply acquired knowledge in practice; formulate problem statements and solve them using programming and data analysis methods.

6. List of learning outcomes of the EP

LO1 - To design database architectures of information systems.

LO2 - To carry out technical design of information systems.

LO3 - To ensure the security and integrity of information systems and technologies.

LO4 - To use software, hardware, information, mathematical, functional support of information systems for software modernization, the formation of sections of the terms of reference for the design of IT-infrastructure, improvement of program modules, data processing for automated systems, design and development of front-end and back-end web resources and descriptions of information and mathematical models.

LO5 - To develop information systems and their components in various subject areas for solving practical scientific and technical problems using modern ICT and IT project management methods, using modern technologies such as 3D modeling, IoT, VR/AR technologies and others as tools.

LO6 - To argue the choice of basic standards, principles and design patterns, methods, tools and programming languages for the development of information systems.

LO7 - To use cooperation with colleagues, teamwork, knowledge of the principles and methods of organization and management of small teams.

LO8 - To use mathematical methods of processing, analysis and synthesis of professional research results in the development of information systems and use information and communication technologies in the field of e-commerce, financial accounting and business processes.

LO9 - To be able to apply the acquired knowledge in the chosen additional educational program.

7. Matrix for correlating the learning outcomes of the EP with the formed competencies (V)

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9
GEC1	V	V			V				
GEC2		V	V						
GEC3			V			V			
GEC4				V			V		
GEC5					V				
GEC6						V			
GEC7							V		
GEC8								V	
GEC9									V

8. Relationship of LO with job functions

№	Learning Outcome (LO)	Job Function / Professional Standard (PS)
1	LO1 – To design database architectures of information systems	Development of IS architecture (PS: "Computer Systems Architecture Management")
2	LO2 – To carry out technical design of information systems	Design and implementation of IT infrastructure (PS: "Computer Systems Infrastructure")
3	LO3 – To ensure the security and integrity of information systems and technologies	Coding and software development focused on security & integrity (PS: "Software Testing")
4	LO4 – To use software, hardware, information, mathematical, functional support of information systems for software modernization, drafting IT-infrastructure TOR sections, enhancing program modules, data processing, front-/back-end web development, and modeling	Coding and software development for modernization & documentation (PS: "Software Testing")
5	LO5 – To develop information systems and their components in various domains, solving practical S&T tasks with modern ICT, project-management methods, and tools such as 3D-modeling, IoT, VR/AR	Project structuring with multimedia elements (PS: "Graphic and Multimedia Design Development")
6	LO6 – To justify the choice of standards, principles, design patterns, methods, tools, and languages for IS development	Coding and software development with rationale for chosen tech stack (PS: "Software Testing")
7	LO7 – To cooperate with colleagues, work in teams, and apply principles and methods of managing small groups	Participation in software modernization; team coordination (PS: "Software Maintenance")
8	LO8 – To apply mathematical methods for processing, analysis, and synthesis of research results in IS development and use ICT in e-commerce, finance, and business processes	Participation in software modernization with data-driven improvements (PS: "Software Maintenance")
9	LO9 – To apply additional knowledge gained through elective study tracks	Project structuring with multimedia elements in specialized contexts (PS: "Graphic and Multimedia Design Development")

9. Table of relationships between competencies, learning outcomes, assessment methods and criteria

Graduate Competencies	Competencies Expressed in Learning Outcomes	Assessment Criteria	Assessment Method
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GC1	LO6. To justify the choice of basic standards, principles, design patterns, methods, tools, and programming languages for information systems development.	Criterion 1.1. Justification of technology selection	Project Defense
		Criterion 1.2. Correctness of applied methods.	Project Defense
GC1	LO9. To be able to apply the acquired knowledge in the chosen additional educational program.	Criterion 5.1. Independent study.	Presentation Report
		Criterion 5.2. Practical application.	Presentation Report
BC2	LO3. To ensure the security and integrity of information systems and technologies.	Criterion 1.1. Correct selection of protection tools.	Test Practical task
		Criterion 1.2. Compliance with standards.	Test Practical task
BC5	LO8. To use mathematical methods of processing, analysis and synthesis of professional research results in the development of information systems and use ICT in e-commerce, financial accounting and business processes.	Criterion 5.1. Use of appropriate models.	Course paper
		Criterion 5.2. Evaluation of result accuracy.	Course paper
PC1	LO1. To design database architectures of information systems.	Criterion 1.1. Compliance of architectural solutions with set tasks.	Course paper Project
		Criterion 1.2. Optimality of the model.	Course paper Project
	LO2. To carry out technical design of information systems.	Criterion 2.1. Accuracy of design documentation.	Practical work Test
		Criterion 2.2. Application of standards.	Practical work Test
	LO4. To use software, hardware, information, mathematical, functional support of IS for software modernization, forming TOR sections, improving modules, data processing, front-/back-end web development and modeling.	Criterion 3.1. Appropriateness of tool selection.	Practical work Test
		Criterion 3.2. Practical implementation.	Practical work Test
PC5	LO5. To develop IS and their components in various domains using ICT, project management methods and technologies such as 3D modeling, IoT, VR/AR.	Criterion 5.1. Adaptation to new conditions.	Final project
		Criterion 5.2. Flexibility of project solutions.	Final project

10. Information about the modules of the educational program

Module code and module name	Volume (labor intensity) of the module	Learning Outcomes	Criteria for assessing learning outcomes	The disciplines that form the module are: Code and Name
GENERAL EDUCATION MODULES				
OOM6001 Social and cultural development	18	LO 7,8,9.	Testing, essays, participation in discussions	HK6002 History of Kazakhstan, SPS6001 Philosophy, SPS6006 Cultural Studies-Psychology, SPS6007 Sociology-Political Science
OOM 6002 Language and ICT Skills Development	25	LO 5,7.	Written assignments, testing, projects in the ICT environment	LAN6001A Foreign Language, LAN6002A Foreign Language, ICT6001 Information Communication Technology, LAN6001KR Kazakh (Russian) Language, LAN6002KR Kazakh (Russian) Language
OOM 6003 Physical Education	8	LO 7,9.	Standards, reports on physical activity, participation	PhC6005 Physical culture, PhC6006 Physical culture
OOM 6004 Personal and Social Development	35	LO 3,5,7,8,9.	Testing, projects, presentations, essays	HUM6400 Inclusive Education, JUR6505 Ecology and sustainable development, RM6001 Research Methodology, ECO6007 Foundation of economics and financial literacy, LAW6007 Fundamentals of Law and Anti-Corruption Culture, JUR6413 Fundamentals safety of life activity, MGT6706 Startups and entrepreneurship
BASIC MODULES				
BM6101. Mathematics and Science	2 6	LO 4,6,8.	Problem solving, testing	MAT6001 Algebra and Geometry, MAT6002 Mathematical Analysis, MAT6003 Discrete Mathematics, MAT6004 Probability Theory and Mathematical Statistics, PHY6001 Physics
BM6102. Fundamentals of programming and algorithms	17	LO 4,5,6,8.	Practical tasks, code	SFT6001 Introduction to Programming, SFT6002 Object Oriented Programming, IS6118 Web programming.
BM6103. Architecture and Functioning of Computer Systems	14	LO 1,2,3,4,5,6,8.	Practical tasks, code	SFT6106 Computer Systems Architecture, SFT6105 Architecture and Design of IS, SFT6003 Operating Systems
BM6104. Web and User Interfaces	11	LO 4,6,7,8.	Mini-projects, presentations	SFT6101 Introduction to Web Development, SFT6107 Human-Computer Interaction
BM6105. Infrastructure and Enterprise Systems	14	LO 1,2,3,4,6,7,8.	Practical tasks , defense, testing	SFT6104 IT Infrastructure, SFT6109 Enterprise Architecture, NET6101 Computer Networks (Cisco)

BM6106. Information Security and Law	8	LO 3,6,7,8.	Case analysis, testing	SEC6101 Information Security & Data Protection, LAW6003 Legal Aspects of ICT
BM6107. Languages and Business Communication	10	LO 6,7.	Essays, business correspondence, presentations	LAN6007K Business correspondence in the state language, LAN6002DA English for STEM, LAN6003PA Professionally oriented foreign language
BM6108. Research and Practice	6	LO 1,2,3,4,5,6,7,8,9.	Report, presentation	RM6101 Project Research, EP 6101 Educational Practice
PROFESSIONAL MODULES				
PM6101. Information Systems Fundamentals and Practical Training	18	LO 1,2,3,4,5,6,7,8.	Internship report, defense	SFT6102 Fundamentals of IS, PP6102 Industrial practice, PP6103 Industrial practice, PP6104 Pre-Diploma practice
PM6102. Data and IT-product Management	12	LO 1,4,5,6,8,	Practical tasks, cases, project defense	IS6121 Data and Information Management, PM6102 IT-product Management, IS6106 IS Innovation and New Technologies (ISB-2)
PM6103 Technology, Programming, Business Process Management and AI	10	LO 4,5,6,7,8.	Solving problems, tests, participating in competitions, defending solutions	IS6101 Cloud Fundamentals (CLD-1), SFT6116 An Introduction to solving ACM ICPC problems(ACM-1), SFT6112 Business Process Management (ISB-1), SFT6152 AR/VR Theory, SFT6186 Artificial Intelligence, SFT6123 Basic algorithms for solving ACM ICPC problems (ACM-2), SFT6115 Multimedia Technology (GD-1), SFT6153 Unity basics
PM6104 Application Development	10	LO 4,5,6,7,8.	Lab work, project, defense, demo presentation	SFT6114 Introduction to Internet of Things (IoT-1), SFT6143 ERP Fundamentals (ERP-1), SFT6127 Development of web applications based on the Spring Framework (ISD-3), SFT6119 Development of Web components on the Java EE platform (ISD-2), SFT6124 Development of mobile applications for Android (Mobile 2)

11. Information about the disciplines of the educational program

No.	Code and Name of the discipline	Brief description of the discipline (30-50 words)	Academic credits	Formable learning outcomes (codes)	Prerequisites	Postrequisites
Cycle of general education disciplines (GED) Mandatory component (MC)						
1.	LAN6001A , LAN6002A Foreign language	The course includes an intensive English language learning program focused on grammar and speaking skills. The course covers topics reflecting the latest advancements in information technology, and the terminology glossary makes them directly relevant to students' needs.	10	LO 7	No	Professionally oriented foreign language
2.	ICT6001 Information and Communication Technologies	The course views information and communication technologies as modern methods and tools for human interaction in everyday and professional activities through the use of information technologies for searching, collecting, storing, processing, and disseminating information.	5	LO 5,7	No	Web Development Basics, Information Security and Data Protection
3.	LAN6001KR , LAN6002KR Kazakh (Russian) language	The course holds a special place in the training system of engineering bachelor's degree programs. For students of a technical university, studying professional Kazakh/Russian languages is not only a way to improve the skills acquired at school but also a means of mastering their future profession.	10	LO 7	No	Business correspondence in the state language
4.	SPS6007 Sociology - Political Science	The "Sociology" course explores various phenomena of social life. This study is conducted through different paradigms of social knowledge, using theories and scientific methods. The "Political Science" course provides a comprehensive overview of all key elements, including the study of political sources and relations, types of political systems, democratic and authoritarian regimes, political mechanisms, competition and power, political capital and values, the survival of political ideas, nationalism, analysis of domestic and foreign policy, political development, and state policy within the global political system.	4	LO 7,8,9	No	No
5.	PhC6006 , PhC6005 Physical culture	The course is dedicated to the formation of personal physical culture and the ability to purposefully use various means of physical education to preserve and strengthen health.	8	LO 7,9	—	—
6.	SPS6006 Cultural Studies - Psychology	As a result of studying the course in Cultural Studies, students will gain a foundation for exploring the full spectrum of social and humanitarian sciences and develop skills in intercultural communication. At the same time, the discipline of Cultural	4	LO7,8,9	-	-

		<p>Studies can serve as a supplement to general courses in history and philosophy. The course material can be used as a methodological guide for several specialized disciplines such as ethics, history of culture, art styles, national management schools, negotiation strategy and tactics, and cultural management.</p> <p>Teaching methods and technologies applied in the implementation of the program include: role-playing games and educational discussions in various formats; case studies (analysis of specific situations); and the project-based method.</p> <p>The Psychology course presents topics related to psychology in a broad educational and social context. The knowledge, skills, and abilities acquired and developed as a result of mastering the course content enable students to apply them in practice across various spheres of life: personal, family, professional, business, public, and in working with people of different social groups and age categories.</p>				
7.	HK6002 History of Kazakhstan	The course examines the modern history of Kazakhstan as an integral part of the history of humanity, as well as the history of Eurasia and Central Asia. Modern history of Kazakhstan refers to the period in which a comprehensive study of historical events, phenomena, facts, and processes is conducted, with the aim of identifying historical patterns that took place on the territory of the Great Steppe during the 20th century and up to the present day.	5	LO 7,9	No	Philosophy
8.	SPS6001 Philosophy	The subject of the course is philosophy as a distinct form of intellectual activity in its cultural-historical development and contemporary interpretation. The course covers major schools of thought and key issues in both global and national philosophy. Philosophy is a unique form of understanding the world, forming a system of knowledge about the fundamental principles and foundations of human life, and about the essential characteristics of the human relationship with nature, society, and spiritual life in all its main dimensions.	5	LO 7, 9	History of Kazakhstan	—
Cycle of general education disciplines (GED) University Component (UC) and/or Elective Component (EC)						
9.	HUM6400 Inclusive Education	The philosophy, history and methodology of an inclusive approach. Documents governing the development of an inclusive process in higher professional education. Educational needs of students with disabilities and disabilities. Methods and forms of	5	LO5,7,9	-	-

		organization of the educational process at a university for students with disabilities. Development of adapted educational programs, curricula and educational paths for students with disabilities and disabilities. Psychological and pedagogical support of students with disabilities and disabilities at the university.				
10.	ECO6007 Foundation of economics and financial literacy	This course provides an integrated introduction to economics and legal foundations relevant to entrepreneurial decision-making and everyday personal finance. Students will understand basic economic principles, and navigate legal systems affecting individuals and businesses and learn how to manage personal finances. Topics include economic behavior, legal research, business budgeting, taxation, investment and case analysis. The course is open to non-economics majors interested in how economic, legal and financial systems shape our lives.	5	LO 5,8,9	-	-
11.	LAW6007 Fundamentals of Law and Anti-Corruption Culture	The course outlines the legal, economic, and social foundations of fighting corruption. Throughout the course, students will gain practical knowledge in identifying the peculiarities of state policies, applying international experiences in combating corruption, mastering skills in conflict resolution, and detecting corruption activities using professional ethics and methods. After successful completion of the course, students will gain the following competencies: 1. Understand the measures of legal responsibility for participation in corruption violations. 2. Determine the conflict of interests in the activities of organizations leading to corruption. 3. Analyze the work of organizations using various research methods.	5	LO 3,7	-	-
12.	JUR6413 Fundamentals safety of life activity	Studying ways of safe human interaction with the environment (industrial, domestic, urban, natural), sustainable operation of business facilities (organizations) in emergency situations, issues of protection from negative factors, prevention and elimination of the consequences of natural and man-made emergencies and the use of modern means defeat.	5	LO 3.8	-	-
13.	RM6001 Research methodology	The course is devoted to the study of activities aimed at developing students' ability to independent theoretical and practical judgments and conclusions, skills of objective evaluation of scientific information, freedom of scientific research and the desire to apply scientific knowledge in	5	LO 8.9	-	-

		educational activities, including for the diploma project (work).				
14.	MGT6706 Startups and Entrepreneurship	This course provides an introduction to what a business is, how it works and how to run it. Students will define ownership and processes used in manufacturing and marketing, finance, personnel, and management in business operations.	5	LO 5,7,9	-	-
15.	JUR6505 Ecology and Sustainable Development	The course reveals the role of ecology in solving modern economic, social and political problems, as well as the emergence of global environmental problems as a result of human production activities and the responsibility of the world community for them. A very important aspect is also international cooperation to ensure sustainable development. Various areas of practical application of ecology are also considered - natural resources and environmental pollution.	5	LO 3,8,9	-	-
Cycle of basic disciplines University component						
16.	SFT6001 Introduction to Programming	To study the methodological basis of program development and practical programming skills. The main objectives of studying the discipline are the following: * Study of the basics of algorithmization of tasks * Learning the basics of classification of programming languages * Study of data types and classification of C++ operators * Development of programs using subroutines, standard modules, programming style, programming quality indicators, methods of debugging and testing programs, the basics of object-oriented programming.	6	LO 4,5,6,8	—	Object-oriented programming
17.	MAT6001 Algebra and Geometry	The successful application of algebra and geometry to solve specific problems is primarily due to the rapid growth of computer technology. The course includes analytical geometry and linear algebra. Linear algebra is a branch of mathematics that studies matrices, vectors, vector spaces, linear transformations, and systems of linear equations. Analytical geometry is a section where the basic concepts are simple geometric shapes (points, lines, planes, curves, and second-order surfaces). The main means of research in analytical geometry are the method of coordinates and methods of elementary algebra.	4	LO 4.8	-	Mathematical analysis Probability Theory and Mathematical Statistics Discrete Mathematics
18.	EP6101 Educational Practice	The practical training includes detailing the finishing blocks of the generalized scheme, identifying the required classes and methods, determining sets of logically interconnected data (data flows), introducing various additional tools to	2	LO 7.9	Introduction to programming	-

		enhance the clarity and improve the level of service of the designed program, developing a generalized algorithm scheme, as well as developing and debugging a program that implements the designed model.				
19.	PHY6001 Physics	The study of the laws, principles, postulates and equations of mechanics, molecular physics and thermodynamics, electricity and magnetism, the use of the equations of physics to solve specific physical problems, the use of physics methods for research, analysis and laboratory work in order to verify the operation and implementation of the laws of physics in nature and technology.	4	LO 4,6,8	-	Computer systems architecture
20.	MAT6002 Mathematical Analysis	The purpose of the course is to familiarize students with important branches of calculus and its applications in computer science. During the educational process, students should familiarize themselves and be able to apply mathematical methods and tools to solve various applied problems. Moreover, they study fundamental methods of studying infinitesimal variables using analysis, which is based on the theory of differential and integral calculations.	6	LO 4,6,8	Algebra and Geometry	Probability Theory and Mathematical Statistics
21.	LAN6007K Business correspondence in the state language	Business correspondence in the state language is a very important subject for students, because given discipline teaches the preparation, execution of documents in the state language, forms practical skills and ability to independently compose, translate documents into Kazakh language.	3	LO 6.7	Kazakh/Russian language	-
22.	LAN6003PA Professionally Oriented Foreign Language	The course is devoted to the analysis of professional topics: "Computers and work", "Work in ICT", "Types of computer systems", "Basics of working with a computer", "Operating systems and graphical interface", "Text processing", "Cyberspace: security and crime", etc.	3	LO 6.7	Foreign language	-
23.	MAT6004 Probability Theory and Mathematical Statistics	The course focuses on probability and statistics of any event, as well as the relationship between mathematics and programming through an interdisciplinary curriculum that deepens mathematical understanding of probability and develops logical and algorithmic thinking skills.	6	LO 4,6,8	Algebra and Geometry	-
24.	SFT6104 IT Infrastructure	This course focuses on information technology infrastructure in a business environment, including internetwork data exchange and distributed data processing. Topics covered include business requirements for distributed systems, systems architecture models (client / server; distributed processing, etc.). Key network models and technologies, security issues related to	5	LO 2,4,6,7,8	Computer networks, Information security and information protection	-

		architecture, design and technology, network configuration and management methods.				
25.	SFT6109 Enterprise Architecture	The main objective of the course is to provide an understanding of the essence of enterprise architecture. The objective of the course is to develop a professional conceptual apparatus and develop skills for its correct application.	4	LO 1,4,7	-	-
Cycle of basic disciplines Component of choice						
26.	LAN6002DA English for STEM	The course is designed to help students develop their English language skills for their current and future academic studies. Improving the level of grammatical accuracy and developing listening, reading, writing and speaking skills in the IELTS format.	4	LO 6.7	Foreign language	-
27.	MAT6003 Discrete Mathematics	The course is devoted to the study of discrete objects and elements of logic. It provides for the study of discrete objects, the solution of combinatorial problems, the study of types of maps and binary relations, the reduction of formulas of the algebra of propositions to normal forms, the application of the algebra of logic to the theory of switching circuits. The ability to analyze and synthesize, mathematical maturity is developing.	6	LO 4,6,8	-	Computer systems architecture
28.	SFT6101 Introduction to Web Development	The purpose of the discipline is to master the technology of designing the structure of a web site as an information system; - mastering the technology of creating a web site with programming tools on the client and server side; - mastering the technology of hosting, support and maintenance of a web site on the server.	6	LO 4,6,8	Information and communication technologies	-
29.	SFT6002 Object Oriented Programming	This course will provide the skills to develop console or windowed applications using the Java programming language using object-oriented programming concepts. Course topics include the OOP paradigm, Java programming, file processing, exceptions, structures, collections, and concepts of object-oriented programming.	5	LO 4,5,6,8	Introduction to programming	IS architecture and design
30.	SFT6003 Operating Systems	This course will provide an introduction to the design and implementation of an operating system. The course will begin with a brief historical overview of the development of operating systems over the past fifty years, and then cover the main components of most operating systems. This discussion will cover the trade-offs that can be made between performance and functionality during the design and implementation of an operating system. Special attention will be paid to three main OS subsystems: process management (processes, threads, CPU scheduling,	5	LO 2,3,4,5,8	Information and communication technologies	-

		synchronization and deadlocks), memory management (segmentation, pagination, paging), file systems and operating system support for distributed systems. Bash language proficiency, network management, network security.				
31.	SFT6107 Human-Computer Interaction	This course combines a component that teaches programming interactive user interfaces with a component that teaches how to improve the usability of these interfaces. The course assumes that interface usability is important for successful software design, and not just as "packaging" or aesthetics.	5	LO 4,6,7,8	Information and communication technologies	-
32.	SEC6101 Information Security & Data Protection	The course focuses on the main topic of security introducing students to the main topics of security arising from the design, analysis and implementation of network and distributed systems. Auxiliary topics enable students to explore broader areas where they can apply their newly acquired skills.	5	LO 3,6,8	Information and communication technologies	-
33.	SFT6105 Architecture and Design of IS	This course focuses on studying large systems, and how they were divided into subsystems and components. Besides, how the structuring of these system elements and their interfaces used to combine them facilitate communication and control. Students will study various notations and formalizations, study the relationship between these structures and key attributes of quality and their impact on system implementation.	5	LO 1, 2,3,4,5,6,8	Object-oriented programming	-
34.	NET6101 Computer Networks (Cisco)	The course explores network communications from local area networks (LANs) to the global Internet. Standard problems and a number of solutions for each of them are considered with a special focus on the TCP / IP protocol suite. Besides, it will prepare students for real information security operations. Knowledge of the basics to work with networks will refresh students with attention to the problems faced by modern infrastructure.	5	LO 2,3,4,6,8	Physics	-
35.	SFT6106 Computer Systems Architecture	The course presents the basic principles of hardware concepts for computer hardware elements and methods to evaluate computer performance used in computer system design processes from the point of view of an assembler programmer, computer architect, and logic developer. The course contains details of the components necessary to understand the concept of machine computing.	4	LO 1,2,3,6,8	Discrete Mathematics, Physics	-
36.	RM6101 Project research	The course is devoted to the study of activities aimed at developing students' ability to make independent theoretical and practical judgments and conclusions, the ability to objectively evaluate scientific information, freedom of scientific search and the desire to	4	LO 1,2,3,4,5,6,7,8	-	-

		apply scientific knowledge in educational activities, including for the implementation of a thesis project (work).				
37.	IS6118 WEB programming	The course continues web development using PHP, JavaScript and other web technologies when programming information web systems. The course introduces advanced web design methods. Topics include customer expectations, advanced markup language, multimedia technology, usability and accessibility, and web design evaluation methods.	6	LO 4,6,8	Introduction to Web Development	-
38.	LAW6003 Legal Aspects of ICT	"The discipline "Legal aspects of information and communication technologies" is theoretical and applied in nature and offers to familiarize students with the basics of the legislation of the Republic of Kazakhstan in the field of regulating relations in the field of information and communication technologies. Within the framework of this discipline, students get acquainted with the basics of state policy in the field of information, with the basic concepts of information law and information security, with the features of the information system, forms and methods of ensuring information security of commercial and government structures."	3	LO 6.7	-	-
Cycle of major disciplines University component						
39.	SFT6102 Fundamentals of IS	This course is devoted to the full life cycle of information systems development, from the description of the idea, the development of technical specifications, modeling, development, testing, debugging of software, calculation of a feasibility study of the cost of developing an information system, ending with a presentation for the customer. The course also covers theoretical and practical issues of building and functioning of IS, namely the classification of IS, UML modeling, ADO technology, criteria for evaluating IT projects, etc.	5	LO 1,2,3,4,5,6	-	-
40.	PP6102 , PP6103 Industrial practice	The practical training includes the study of organizational structures and complexes of technical tools used in the organization of an Information and Analytical Center (IAC). It involves identifying the main tasks solved by the IAC; studying the informational support of the selected software task (task complex or subsystem); studying the mathematical support of the selected software (task complex or subsystem); studying the software tools of the selected task (task complex or subsystem); and examining the	8	LO 4,5,7,8	-	-

		organizational and legal support of the selected task (task complex or subsystem). The training also includes the systematization and analysis of factual materials required for writing term papers, scientific reports, and internship documentation.				
41.	IS6121 Data and Information Management	The course explains what a database system is, and then proceeds to most of the training material for studying relational database systems - databases designed according to a relational (or tabular) model. Then the course moves from data abstraction to transaction management with additional materials to improve query performance. Finally, modern trends in the design of database systems have emerged, which also determine the latest developments in the broader history of data storage technologies.	7	LO 1,4,6,8	Object-oriented programming	-
42.	PM6102 IT-product Management	This course provides students with a comprehensive overview of the principles, processes, and practices of software project management. Students learn methods for planning, organizing, planning and monitoring software projects. Students will gain practical project management skills and skills related to defining a software project, establishing project communications, managing project changes and managing distributed teams and software projects.	5	LO 4,5,6,8	-	-
43.	PP6104 Pre-diploma practice	The internship includes consolidation of theoretical knowledge acquired through academic courses; mastering practical skills and performing tasks directly at the workplace using personal computers, modern software, and office equipment. It also involves studying and analyzing the observed dynamics in the static and dynamic aspects of CAD systems over both gradual and long-term periods, using a specific enterprise as the basis for practical experience. The practice includes evaluating the achieved commercial results of innovative development in both short-term and long-term periods, based on enterprise performance data. Additionally, it provides familiarity with the equipment and organization of CAD development, adoption of procedures, and implementation of automation solutions in private enterprises. Collection of materials for the completion of graduation projects is also part of the internship.	5	LO 4,5,6,7,8	-	-
Cycle of major disciplines Component of choice						

44.	SFT6116 An Introduction to solving ACM ICPC problems(ACM-1)	The course is designed for studying basic algorithms and data structures to solve different problems of competitive programming contests. For this purpose, using data structures, principles of construction of algorithms and programs, methods of solving, programming, debugging and implementation of programs are considered	5	LO 4,5,6,7,8	-	-
45.	SFT6152 AR/VR Theory	The aim of the course is to study the history of technology development and highlights the theory of AR/VR. Therefore, the discipline consists of the following sections: 1. Virtual reality: the history of development and devices; 2. Augmented Reality: History and devices; 3. VR and AR applications; 4. Interface design for AR/VR applications; 5. AR/VR Market; 6. Challenges and prospects of AR/VR development. "Virtual Reality: the History of development and devices" highlights the stages of technology development in different years. Also at this stage, various devices and their structure are being studied, which allow you to work in VR mode. The section "Augmented Reality: History and Devices" introduces students to how AR develops and what devices capable of working with technology consist of.	5	LO 4,5,6,7,8	Information and communication technologies, Human-computer interaction	-
46.	IS6101 Cloud Fundamentals (CLD-1)	The purpose of the course is to study the main topics of the course: Introduction to system analysis. System disciplines, methods, system analysis procedure, main stages of system analysis, Mathematical and software tools of a system analyst. Methods of organization survey, history of system analysis development. Classification and typical composition of information systems, types of support Creation goals, project requirements, design methods, information flows, information system architecture. Information system life cycle Features of design as a type of activity, software design tools. Project risks, development priorities, time of errors and their consequences, implementation problems. Organization of work, project management, interaction with customers and experts As a result of mastering the discipline, the student should be able to: knowledge of the basic principles and approaches of system analysis and design, allowing to explore complex information systems; the ability to apply the knowledge gained for the system analysis of business processes; knowledge of the	5	LO 4,5,6,7,8	Mathematical Analysis, Information and Communication Technologies, Introduction to Programming	-

		methods of application of modern tools of system analysis and design of business processes.				
47.	SFT6112 Business Process Management (ISB-1)	The course examines the theoretical basis of the process management of the company, as well as the skills and knowledge necessary to manage the production, marketing, innovation, personnel and financial areas of the enterprise based on the process management methodology	5	LO 4,5,6,7,8	-	-
48.	SFT6127 Development of web applications based on the Spring Framework (ISD-3)	This course prepares students to use frameworks that have two main functions: working on the server side (backend) and working on the client side (frontend). Prepare them for the development of Frontend frameworks related to the external part of the application, responsible for the appearance of the application. And the development of the Backend, which is responsible for the internal structure of the application.	5	LO 4,5,6,7,8	Development of Web Components on the Java EE Platform (ISD-2)	-
49.	SFT6114 Introduction to Internet of Things (IoT-1)	The purpose of the course is to study the element base of the "Internet of Things" devices, with operating systems and programming languages. Students will master wired protocols of information exchange between devices; wireless protocols of information exchange; methods of aggregation and processing of data from remote devices.	5	LO 4,5,6,7,8	Physics	-
50.	SFT6143 ERP Fundamentals (ERP-1)	The course includes: a brief history of ERP. What is the ERP-system. The concept of enterprise resource planning systems. The concept of the next generation of ERP-II. What can you do ERP system. Functions of the ERP system. The main purpose of the ERP-system. Scope of application. Characteristics of ERP-systems. Selection of ERP-system. ERP architecture. Classification of ERP-systems. Market analysis of ERP-systems. Introduction. New trends: lease of ERP-systems. overview of SAP R / 3.	5	LO 4,5,6,7,8	Fundamentals of IS	-
51.	MNR6701 Minor 1	The course is intended for the development of competencies other than profiling	5	LO 4,5,6,7,8	-	-
52.	IS6106 IS innovation and new technologies (ISB-2)	The purpose of this discipline is to study the concept of logistics system management in terms of procurement management. The interrelation of the concepts of strategy management, their correct definition and interpretation significantly facilitate the work to improve the efficiency of the organization.	5	LO 4,5,6,7,8	-	-
53.	MNR6702 Minor 2	The course is intended for the development of competencies other than profiling	5	LO 4,5,6,7,8	-	-

54.	SFT6115 Multimedia Technology (GD-1)	"The main purpose of studying the discipline is to form students' scientific ideas about the essence and function of modern multimedia systems and technologies, their place and role in the system of information systems and technologies, mastering practical skills in the effective use of multimedia technologies in solving real practical problems, forming students' ability to formalize working results in the form of presentations, scientific and technical reports, articles and reports at scientific and technical conferences, as well as providing general training (basic knowledge) for solving practical problems in the field of information systems and technologies."	5	LO 4,5,6,7,8	Information and communication technologies	-
55.	SFT6123 Basic Algorithms for Solving ACM ICPC Problems (ACM-2)	The course is designed for studying of basic algorithms and data structures to solve different ACM ICPC problems. For this purpose, using data structures, principles of construction of algorithms and programs, methods of solving, programming, debugging and implementation of programs are considered.	5	LO 4,5,6,7,8	-	-
56.	SFT6186 Artificial Intelligence	The purpose of the course is to study the basics of artificial intelligence, various types of neural networks and their application in various tasks, machine learning methods, principles of building neural networks. As a result of mastering the discipline, students will gain knowledge in the field of modern models of artificial neural networks, learn how to use them to solve practical problems. Students will have to carry out innovative engineering projects on development and software for various purposes using modern design methods, advanced experience in developing competitive products, analyze and compare them. Students will be able to set tasks and develop algorithms for solving them for the implementation of software implementations of neural networks in order to solve various practical problems. This discipline provides a detailed overview and description of the most important methods of training neural networks of various structures, as well as practical tasks solved by these networks.	5	LO 4,5,6,7,8	Mathematical Analysis , Introduction to Programming	-
57.	SFT6153 Unity Basics	This course focuses on the basics of development in the Unity game engine. It will allow students to become familiar with the interface, basic tools and functions of the application. The main goal of the course is to teach students to create their own projects, introduce additional packages. The course will	5	LO 4,5,6,7,8	Information and communication technologies, Human-	-

		explore ways of creating an application interface, writing scripts to ensure interaction between project elements, importing external packages to provide a project with additional functionality, deploying an application on different platforms.			computer interaction	
58.	MNR6703 Minor 3	The course is intended for the development of competencies other than profiling	5	LO 4,5,6,7,8	-	-
59.	SFT6124 Development of mobile applications for Android (Mobile 2)	The purpose of the course is to study the programming of mobile applications using the latest Android technologies. Topics include action lifecycle, resources, layouts, intents for multiple actions, menus, snippets and dialog boxes, action bar, adapters, saving data using shared settings, SQLite, and content providers. The emphasis is on the practical use of these components in applications. Includes a substantial team project.	5	LO 4,5,6,7,8	-	-
60.	SFT6119 Development of Web Components on the Java EE Platform (ISD-2)	This course prepares students for the Oracle Certified Professional Level Professional: Java EE 5 Web Component Developer (OCPJWCD) certification, which requires a basic understanding of developing Java components (servlets and JSPs) used in web applications.	5	LO 4,5,6,7,8	-	Development of Web Components on the Java EE Platform (ISD-2)

12. Curriculum of the educational program (Platonus)

Module code	Module name	The Cycle of Discipline	Component of discipline	Discipline code	Name of the discipline	Academic credits	Academic period of study	Control by academic periods			Number of hours							Distribution of credits across academic periods									
											Total	Classroom work					SRO		1 course		2nd year		3rd year		4th year		
								Exams	Differentiated credit	Coursework/project		Lectures	Laboratory	Practical	Studio classes	Practice	SROP	SRO	1	2	3	4	5	6	7	8	
																			Weeks in the academic period								
																			15	15	15	15	15	15	15	15	
General Modules																											
1	OOM6002 Language and ICT Skills Development Module	GED	RC	LAN6001KR	Kazakh (Russian) language	5	1	1			5/150			45			15	90	5.0								
2		GED	RC	LAN6001A	Foreign language	5	1	1			5/150			45			15	90	5.0								
3		GED	RC	ICT6001	Information and communication technologies	5	1	1			5/150	15	30.0				15	90	5.0								
4		GED	RC	LAN6002A	Foreign language	5	2	2			5/150			45			15	90		5.0							
5		GED	RC	LAN6002KR	Kazakh (Russian) language	5	2	2			5/150			45			15	90		5.0							
6	OOM6001 Social and Cultural Development Module	GED	RC	SPS6007	Sociology-Political Science	4	2	2			4/120	15		30			15	60		4.0							
7		GED	RC	HK6002	History of Kazakhstan	5	3	3			5/150	15		30			15	90			5.0						
8		GED	RC	SPS6006	Cultural Studies-Psychology	4	3	3			4/120	15		30			15	60			4.0						
9		GED	RC	SPS6001	Philosophy	5	4	4			5/150	15		30			15	90				5.0					
10	OOM6003 Physical Education Module	GED	RC	PhC6005	Physical culture	4	2	2			4/120			45			15	60		4.0							
11		GED	RC	PhC6006	Physical culture	4	3	3			4/120			45			15	60			4.0						
12	OOM6004 Personal and Social Development Module	GED	EC	MGT6706	Startups and Entrepreneurship	5	8	8			5/150	15		30			15	90								5.0	
13		GED		RM6001	Research Methodology			8			5/150	15		30			15	90									
14		GED		JUR6413	Fundamentals safety of life activity			8			5/150	15		30			15	90									
15		GED		JUR 6505	Ecology and Sustainable Development			8			5/150	15		30			15	90									
16		GED		LAW6007	Fundamentals of Law and Anti-Corruption Culture			8			5/150	15		30			15	90									
17		GED		ECO6007	Foundation of economics and financial literacy			8			5/150	15		30			15	90									
18		GED		HUM6400	Inclusive education			8			5/150	15		30			15	90									
Modules of the specialty/educational program																											
19	BM6101 Mathematics and Science	BD	UC	MAT 6001	Algebra and Geometry	4	1	1			4/120	15		30			15	60	4.0								
20		BD	UC	MAT6002	Mathematical analysis	6	2	2			6/180	30		30			15	105		6.0							
21		BD	UC	PHY6001	Physics	4	2	2			4/120	15	30.0				15	60		4.0							

22		BD	EC	MAT6003	Discrete Mathematics	6	3	3			6/180	30		30			15	105			6.0				
23		BD	UC	MAT6004	Probability Theory and Mathematical Statistics	6	4	4			6/180	30		30			15	105			6.0				
24	BM6102 Fundamentals of programming and algorithms	BD	UC	SFT6001	Introduction to programming	6	1	1			6/180	15	30.0	15			15	105	6.0						
25		BD	EC	SFT6002	Object oriented programming	5	4	4			5/150	15	30.0				15	90			5.0				
26		BD	EC	IS6118	WEB programming	6	7	7			6/180	30	30.0				15	105					6.0		
27	BM6108 Research and Practice	BD	UC	EP 6101	Educational practice	2	2				2/60					60			2.0						
28		BD	EC	RM6101	Project research	4	7	7			4/120	15		30			15	60					4.0		
29	BM6107 Languages and Business Communication	BD	UC	LAN6007K	Business correspondence in the state language	3	3	3			3/90			30			15	45			3.0				
30		BD	EC	LAN6002DA	English for STEM	4	3	3			4/120			45			15	60			4.0				
31		BD	UC	LAN6003PA	Professionally oriented foreign language	3	4	4			3/90			30			15	45			3.0				
32	BM6104 Web and User Interfaces	BD	EC	SFT6101	Introduction to Web Development	6	4	4			6/180	30	30.0				15	105			6.0				
33		BD	EC	SFT6107	Human-computer interaction	5	5	5			5/150	15	30.0				15	90			5.0				
34	BM6103 Architecture and Functioning of Computer Systems	BD	EC	SFT6003	Operating systems	5	4	4			5/150	15	30.0				15	90			5.0				
35		BD	EC	SFT6105	Architecture and design of IS	5	5	5			5/150	15	30.0				15	90				5.0			
36		BD	EC	SFT6106	Computer systems architecture	4	6	6			4/120	30	15.0				15	60				4.0			
37	BM6106 Information Security and Law	BD	EC	SEC6101	Information Security & Data Protection	5	5	5			5/150	15	30.0				15	90			5.0				
38		BD	EC	LAW6003	Legal aspects of ICT	3	8	8			3/90	15		15			15	45						3.0	
39	BM6105 Infrastructure and Enterprise Systems	BD	EC	NET6101	Computer Networks (Cisco)	5	5	5			5/150	15	30.0				15	90			5.0				
40		BD	UC	SFT6109	Enterprise architecture	4	7	7			4/120	15	30.0				15	60					4.0		
41		BD	UC	SFT6104	IT infrastructure	5	7	7			5/150	15	30.0				15	90					5.0		
42	PM6101 Information Systems Fundamentals and Practical Training	MD	UC	SFT6102	Fundamentals of IS	5	2	2			5/150	15	30.0				15	90		5.0					
43		MD	UC	PP6102	Industrial practice	4	4				4/120					120				4.0					
44		MD	UC	PP6103	Industrial practice	4	6				4/120					120						4.0			
45		MD	UC	PP 6104	Pre-diploma practice	5	8				5/150					150								5.0	
46	PM6103 Technology, Programming, Business Process Management and AI	MD	EC	IS6101	Cloud Fundamentals (CLD-1)	5	5	5			5/150	15	30.0				15	90							
47		MD		SFT6116	An Introduction to solving ACM ICPC problems(ACM-1)			5			5/150	15	30.0				15	90							
48		MD		SFT6112	Business Process Management (ISB-1)			5			5/150	15	30.0				15	90							
49		MD		SFT6152	AR/VR Theory			5			5/150	15	30.0				15	90							
50		MD	EC	SFT6186	Artificial intelligence	5	7	7			5/150	15	30.0				15	90						5.0	
51		MD		SFT6123	Basic Algorithms for Solving ACM ICPC Problems (ACM-2)			7			5/150	15	30.0				15	90							

52		MD		SFT6115	Multimedia Technology (GD-1)			7			5/150	15	30.0				15	90								
53		MD		SFT6153	Unity Basics			7			5/150	15	30.0				15	90								
54	PM6104 Application Development	MD	EC	SFT6114	Introduction to Internet of Things (IoT-1)	5	5	5			5/150	15	30.0				15	90								
55		MD		SFT6143	ERP Fundamentals (ERP-1)			5			5/150	15	30.0				15	90								
56		MD		SFT6127	Development of web applications based on the Spring Framework (ISD-3)			5			5/150	15	30.0				15	90								
57		MD	EC	SFT6119	Development of Web Components on the Java EE Platform (ISD-2)	5	8	8			5/150	15		30			15	90								
58		MD		SFT6124	Development of mobile applications for Android (Mobile 2)			8			5/150	15		30			15	90								
59	PM6102 Data and IT-product Management	MD	UC	IS6121	Data and information management	7	6	6			7/210	30	30.0	15			15	120						7.0		
60		MD	EC	IS6106	IS innovation and new technologies (ISB-2)	5	6	6			5/150	15	30.0				15	90					5.0			
61		MD	EC	PM6102	IT-product Management	5	8	8			5/150	15	30.0				15	90							5.0	
Optional modules																										
62	Additional educational program	PD	EC	MNR6701	Minor 1	5	5	5			5/150	15		30			15	90					5.0			
63		PD	EC	MNR6702	Minor 2	5	6	6			5/150	15		30			15	90						5.0		
64		PD	EC	MNR6703	Minor 3	5	7	7			5/150	15		30			15	90							5.0	
Average weekly workload in hours																		0	0	0	0	0	0	0	0	
1	General Education Disciplines (GED)					56		12	0	0	1530	75	30	390	0	0	165	870	15	18	13	5	0	0	0	5
	Required Component (GED/RC)					51		11	0	0	1530	75	30	390	0	0	165	870	15	18	13	5	0	0	0	0
	University Component (GED/UC)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Elective Component (GED/EC)					5		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
2	Basic disciplines (BD)					106		22	0	0	3180	375	375	285	0	60	330	1755	10	12	13	25	20	4	19	3
	Required Component (BD/RC)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	University Component (BD/UC)					43		9	0	0	1290	135	120	165	0	60	135	675	10	12	3	9	0	0	9	0
	Elective Component (BD/EC)					63		13	0	0	1890	240	255	120	0	0	195	1080	0	0	10	16	20	4	10	3
3	Major disciplines (MD)					70		11	0	0	1500	120	120	105	0	390	105	660	0	5	0	4	15	21	10	15
	Required Component (MD/RC)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	University Component (MD/UC)					30		3	0	0	900	60	90	15	0	390	45	300	0	5	0	4	0	11	0	10
	Elective Component (MD/EC)					40		8	0	0	600	60	30	90	0	0	60	360	0	0	0	0	15	10	10	5
Total for the curriculum						232			0	0	6210	570	525	780	0	450	600	3285	25	35	26	34	35	25	29	23
6	Additional types of training															Number of credits		Academic period		Number of hours		Number of weeks				
7	Final assessment module (FAM)														8				240.0							
Total including Final Attestation (FA)														240				7200.0								

13. Additional educational programs (Minor)

Title of the Additional Educational Program (Minor), with a list of disciplines forming the Minor	Number of credits for the Additional Educational Program / number of credits for the discipline	Description, Competencies formed by the Additional Educational Program, Learning outcomes
Title of the Additional Educational Program (Minor)	15	
- MNR6701 Minor 1	5	
- MNR670 2 Minor 2	5	
- MNR670 3 Minor 3	5	