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Higher and Postgraduate Educational Programs

☐ Project EP ☐ Participant of project EP

Date of registration in the Registry

23.07.2026

Registration number

6B06100410

Field of education

6B06 Information and Communication technologies

Direction of personnel training

6B061 Information and Communication technologies

Group of educational programs

B057 Information technologies

Educational program

6B06106 Information Systems – Computer and Automation Engineering

EP purpose

To train qualified specialists who possess highly effective methods of information processing and are capable of a knowledge in the field of information systems, who have practical skills and leadership qualities, and who meet mc quality of higher education professionals.

EP type

New EP

Level on NQF

6

Level on SQF

6

EP distinctive features

Double diploma EP

OHPE type

Foreign OHPE

Partner OHPE

Universita’ Politecnica delle Marche

Language of education

☐ multilingual ☒ English

Professional Standard for EP

Exists

Nº	Name of professional standard
1	Software testing
2	Cloud technology developments
3	Systems analyst
4	Development of artificial intelligence applications

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ЕДИНАЯ ПЛАТФОРМА
ВЫСШЕГО ОБРАЗОВАНИЯ

English

Professional standard has been approved

developing EP

Professional standard №1

Professional standardТестирование программного обеспечения

Approval year2022

CCEA

Professions

Profession №1

ProfessionДизайнер программного обеспечения

Уровень по ОРК6

Labor functions

Применение системы управления качеством в соответствии с внутренними и внешними стандартами качества, и от

Поддержание внешней сертификации в соответствии со стандартами качества, и от

Прототипирование ПОРуководство программированием программного обеспечения

Profession №2

ProfessionИнженер-программист

Уровень по ОРК6

Labor functions

Применение системы управления качеством в соответствии с внутренними и внешними стандартами качества, и от

Написание кода и разработка программы для ПО

Поддержание внешней сертификации в соответствии со стандартами качества, и от

Составление алгоритма и создание блок схемы на основе спецификации ПО

Professional standard №2

Professional standardСистемный аналитик

Approval year2023

CCEA,

Professions

Profession №1

ProfessionСистемный аналитик

Уровень по ОРК6

Labor functions

Концептуально-логическое проектирование ИТ-системы/продукта

Планирование сбора, выявление и анализ исходных данных для проектирования ИТ-системы/продукта

Professional standard №3

Professional standardРазработка приложений искусственного интеллекта

Approval year2022



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Professions

Profession №1

Profession

Программист приложений

Уровень по ОРК

6

Labor functions

Разработка и программная реализация системы искусствен

Проектирование систем искусственного интеллекта

Professional standard №4

Professional standard

Разработки по облачным технологиям

Approval year

2022

CCEA

Professions

Profession №1

Profession

Разработчик облачных технологий

Уровень по ОРК

6

Labor functions

Управление работами и разработка программного обеспечения с

Проектирование и сопровождение облачных систем

Volume of the credits

246

Degree to be conferred

Bachelor

Period of study

4

Date of approval EP on the Academic Council

27.04.2026

☒Existence of the annex to the license for the direction of personnel training

The license number on the direction of training

KZ49LAM00007465

☐The training format is online

☐EP accreditation existence

Atlas of new professions

не предусмотрено

Regional standard

<https://enic-kazakhstan.edu.kz/files/1744378861/rl-k-kartasy-zhet-su-oblysy.pdf>

Инженер по разработке и интеграции ИИ и нейросетевых решений;

VR/AR Архитектор



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Nº	Educational outcome	Code	Reflects the labor function
1	Demonstrate	ON	
2	Evaluate and	ON	Применение системы управления качеством в соответствии с внутренними и внешними стандартами Планирование сбора, выявление и анализ исходных данных для проектирования ИТ-систем
3	Develop data	ON	Составление алгоритма и создание блок-схемы на основе спецификации ПО Написание концептуально-логического проектирования ИТ-системы/продукта Планирование сбора, выявление и анализ исходных данных для проектирования ИТ-систем
4	Develop, test,	ON	Написание кода и разработка программы для ПО Руководство программированием программ Управление работами и разработка программного обеспечения облачных систем Разработка
5	Build mathematical	ON	Проектирование ПО Планирование сбора, выявление и анализ исходных данных для проектирования ИТ-систем Проектирование систем искусственного интеллекта
6	Design, administrative	ON	Проектирование ПО Написание кода и разработка программы для ПО Проектирование систем искусственного интеллекта Управление работами и разработка программного обеспечения облачных систем
7	Design computational	ON	Проектирование ПО Концептуально-логическое проектирование ИТ-системы/продукта
8	Plan and	ON	Руководство программированием программного обеспечения и разработка документации Поддержание внешней сертификации в соответствии со стандартами качества, и отслеживание Концептуально-логическое проектирование ИТ-системы/продукта Планирование сбора, выявление и анализ исходных данных для проектирования ИТ-систем Управление работами и разработка программного обеспечения облачных систем
9	Apply artificial	ON	Проектирование ПО Написание кода и разработка программы для ПО Разработка и проектирование систем искусственного интеллекта Проектирование систем искусственного интеллекта
10	Develop and	ON	Написание кода и разработка программы для ПО Руководство программированием программ Управление работами и разработка программного обеспечения облачных систем Проектирование систем искусственного интеллекта
11	Apply information	ON	Применение системы управления качеством в соответствии с внутренними и внешними стандартами Проектирование и сопровождение облачных систем
12	Design and	ON	Концептуально-логическое проектирование ИТ-системы/продукта Проектирование и сопровождение облачных систем Управление работами и разработка программного обеспечения облачных систем Проектирование систем искусственного интеллекта Руководство программированием программного обеспечения и разработка документации

Data on disciplines

Nº	Name of discipline	Short description of discipline	Cycle
1	Fundamentals of Scientific Research	The course aims to develop knowledge of the principles, technologies, practical methods, and techniques of conducting scientific research based on modern advances in science. The course develops the foundations of scientific culture, academic integrity, and academic writing, as well as skills in searching, analyzing, critically evaluating, and synthesizing scientific information, planning and organizing research activities, and preparing and formatting scientific papers in accordance with academic standards. It also fosters the ability to independently acquire new knowledge and apply it in academic, research, and professional activities.	GED

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2	Ilyastanu	high aesthetic taste, appreciating literature, art, traditions, culture and language of the Kazakh people through a deep and comprehensive study of the works of Ilyas Zhansugurov. Forms an understanding of the importance of the works of Ilyas Zhansugurov in the development of the Kazakh literary language; skills of intellectual and creative thinking, the ability to cherish the values of national and spiritual heritage.	GED
3	Fundamentals of Financial Literacy	The course is aimed at developing students' knowledge and practical skills in personal financial management. It covers the fundamentals of financial planning, budgeting, saving and growing financial resources, as well as modern financial instruments and products. Students acquire skills in analyzing financial information, assessing financial risks, selecting sound investment decisions, making independent financial decisions, and searching for and critically evaluating information, which support their continuous professional and personal development.	GED
4	Basics of Law and Anti-Corruption Culture	The aim is to familiarize students with the main branches and institutions of law, the basics of an anti-corruption culture, as well as the laws of the emergence, development and functioning of the state and law. The course forms the skills of an anti-corruption culture and a high level of theoretical knowledge about the main functions of law in the state and society, its impact on the development of law-based state, civil society. Contributes to the development of the principles of academic integrity and legal responsibility in academic, research, and professional activities.	GED
5	Ecology and Life Safety Basics	Purpose – to form knowledge on the basics of ecology and life safety, allowing to analyze environmental processes, assess the socio-ecological consequences of anthropogenic activities, methods and technologies of protection in emergency situations. Develops skills to assess the impact of environmental factors on human health; predict environmental processes for planning and implementing measures to improve life safety; make decisions in adverse environmental and emergency situations, taking into account the possible consequences of accidents, catastrophes, natural disasters.	GED
6	Economics and Entrepreneurship	The purpose is to familiarize students with the economic problems of modern society, the formation of economic thinking and gaining knowledge in the field of theoretical foundations and practical skills in the field of entrepreneurship. It is focused on the formation of students' comprehensive understanding of the laws of the functioning of the economy, obtaining business education aimed at acquiring applied competencies in various fields of entrepreneurial activity, reveals the features of creating and successfully running their own business.	GED
7	Fundamentals of Cloud Technologies	The discipline is aimed at developing students' knowledge and practical skills in cloud technologies and their application in the development, deployment, and maintenance of information systems. It covers the main cloud service models (IaaS, PaaS, SaaS), cloud deployment models (public, private, and hybrid), principles of virtualization, containerization, data storage and processing in cloud environments, as well as issues of security, scalability, and availability of cloud solutions. Students acquire skills in using modern cloud platforms and services for application deployment, data storage, collaboration, and solving applied tasks, taking into account information security requirements and the efficient use of computing resources.	BD
8	Fundamentals of Automation	The discipline is aimed at developing students' knowledge of the fundamental principles of automation and automatic control required for the design and operation of modern information and control systems. The course covers the basic concepts of automatic control, the structure and classification of automation systems, the operating principles of sensors, actuators, and controllers, as well as the fundamentals of designing process control systems. Students study mathematical models of control objects, methods for analyzing the stability and performance of automatic control systems, the principles of feedback control systems, and modern automation technologies.	BD

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9	Automation and Robotics Technology	robotic and automated systems intended to perform tasks without direct human intervention. It covers the design of mechanical structures, the use of sensors, actuators, and microcontrollers, as well as the programming of industrial manipulators and mobile robots. Particular attention is given to the integration of intelligent control algorithms, the automation of production processes, and the improvement of their accuracy, efficiency, and safety. The acquired knowledge and skills enable the development of modern robotic systems, smart home technologies, autonomous vehicles, and other innovative solutions that form the basis of future industry.	BD
10	Automatic Control Theory	The discipline is aimed at developing students' knowledge of the theoretical foundations of automatic control, methods for the analysis and synthesis of control systems, as well as practical skills in modeling and studying dynamic systems. The course covers mathematical models of linear and nonlinear automatic control systems, transfer functions, block diagrams, stability, control quality and accuracy characteristics, and methods for analyzing transient processes. Students study the principles of automatic control system synthesis, methods for tuning and optimizing controller parameters, and modern software tools for modeling and analyzing dynamic systems.	BD
11	Basics of Information Systems	The discipline is aimed at developing knowledge in the modeling of information processes and the design of modern information systems. It covers fundamental models of information processes, principles of their organization at the physical and data link layers, and contemporary approaches to the design and development of information systems for various purposes. Students study methods of analysis, modeling, and development of information systems, as well as acquire practical skills in applying modern technologies and tools to create effective information solutions across different application domains.	BD
12	Databases in Information Systems	The discipline is aimed at developing knowledge and practical skills in database design, development, and management. It covers the main stages of database design, including conceptual, logical, and physical modeling, as well as the features of hierarchical, network, and relational data models. Students study data definition and manipulation languages, query formulation tools, and methods for efficient data storage and processing. Particular attention is given to database system architecture, modern approaches to database design and development, and the practical application of databases in information systems for various purposes.	BD
13	Modeling Information Processes and Systems	The discipline examines the main classes of models and modeling methods, the principles of constructing models of information processes, as well as methods of formalization, algorithmization, and implementation of models using modern computer tools. It also covers techniques for conducting computational experiments using simulation modeling.	BD
14	Algorithms, Data Structures and Programming	The discipline is aimed at studying the fundamental concepts of algorithmization and programming, mastering basic algorithm structures, and understanding the principles of a structured approach to algorithm design. It develops skills in the use of subprograms in software development and introduces algorithmic languages, their purpose, requirements, and the features of procedural programming languages.	BD
15	Network Database Management Systems	The discipline is aimed at developing knowledge and practical skills in the design, administration, and operation of database management systems functioning in network environments. It covers the principles of data storage, processing, and transmission, mechanisms of distributed access to information resources, and the interaction between client and server applications. Particular attention is given to ensuring data integrity, security, and reliability, as well as methods for the efficient management of information resources in distributed information systems.	BD



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16	General Physics 1	mechanics and to study the basic laws of mechanical motion. The course covers kinematic and dynamic characteristics of the motion of material bodies, concepts of space, time, and reference systems, and methods for describing rectilinear, curvilinear, and rotational motion. Students study Newton’s laws, basic types of forces in mechanics, including gravitational, elastic, and frictional forces, as well as the principles of relativity and the properties of inertial and non-inertial reference frames. Particular attention is given to rigid body dynamics, torque, moment of inertia, rotational motion laws, and their practical application in solving physical and engineering problems. The acquired knowledge provides a theoretical foundation for further study in engineering and natural science disciplines.	BD
17	General Physics 2	The discipline is aimed at developing fundamental knowledge in electricity and electromagnetism, as well as studying the laws governing electric charge interactions and the transfer of electrical energy. It covers the main characteristics of electric fields, the law of conservation of electric charge, the principle of superposition, properties of electric dipoles, electric flux, and Gauss’s theorem. Particular attention is given to methods for calculating electric fields, the concepts of electric potential and field intensity, their interrelation, and the analysis of electric field work. Students also study the conditions for electric current formation, the fundamentals of the classical electron theory of electrical conductivity in metals, as well as Ohm’s law and the Joule–Lenz law and their application in solving physical and engineering problems.	BD
18	Mathematical Analysis 1	The discipline aims to develop fundamental knowledge in mathematical analysis and to build skills in function analysis. The course covers sets of real numbers, functions and their representations, limits of sequences and functions, properties of limits, continuity, and points of discontinuity. Students study differential calculus, including derivatives and differentials, rules of differentiation, higher-order derivatives, theorems on differentiable functions, methods for evaluating indeterminate forms, and the application of Taylor’s formula. Particular attention is given to the investigation of function properties, determination of intervals of monotonicity, convexity and concavity, as well as graph construction and analysis. The acquired knowledge provides a theoretical foundation for further studies in applied mathematics, engineering disciplines, and modern information technologies.	BD
19	Mathematical Analysis 2	The discipline is aimed at developing fundamental knowledge in multivariable calculus and differential equations, as well as enhancing skills in mathematical modeling and solving applied problems. It covers limits and continuity of functions of several variables, partial derivatives, total differentials, methods of differentiating composite and implicit functions, higher-order derivatives, and their properties. Particular attention is given to the study of geometric properties of surfaces, tangent planes and normal vectors, directional derivatives, gradient, and optimization problems for multivariable functions. In addition, students study the main types of differential equations, methods for solving them, the Cauchy problem, higher-order linear differential equations, Lagrange’s method, and differential equations with constant coefficients. The acquired knowledge forms a basis for mathematical modeling in science, engineering, and information technologies.	BD
20	Object-Oriented Programming	The discipline is aimed at developing students’ competencies in professional software development using an object-oriented approach, including the principles of encapsulation, inheritance, and polymorphism. Students acquire practical skills in designing and implementing classes, client-side applets, and standalone applications that meet real-world customer and employer requirements.	BD



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21	Operating Systems	design, development, and implementation of operating systems. The course covers the main stages of operating systems evolution, their architecture and key components, as well as the principles of effective interaction between hardware and software. Particular attention is given to process and thread management subsystems, CPU resource scheduling, synchronization mechanisms and deadlock prevention, memory management including segmentation, paging, and virtual memory, as well as file system organization and support for distributed computing environments. The course also includes the fundamentals of the Bash command language, computer network administration, and network security. The acquired competencies enable students to develop, configure, and maintain modern operating systems and network infrastructure.	BD
22	Numerical Methods	The discipline is aimed at developing knowledge and practical skills in numerical methods and computer-based mathematical modeling. It covers algorithms for approximate computations used to solve complex mathematical problems using modern computational tools. Students study methods for solving nonlinear equations and systems of linear algebraic equations, interpolation and approximation of functions, numerical differentiation and integration, and methods for solving ordinary differential equations. Particular attention is given to computational accuracy, error estimation and analysis, and the study of stability and convergence of numerical algorithms. The acquired knowledge enables the application of modern computational methods to scientific, engineering, and applied problems.	BD
23	Linear Algebra and Geometry	The discipline is aimed at developing fundamental knowledge in linear algebra and analytical geometry, as well as enhancing skills in solving mathematical and engineering problems. It covers matrices and determinants of various orders, their properties and computational methods, inverse matrices, matrix rank, and methods for determining it. Particular attention is given to vector spaces, linear operations on vectors, coordinate systems in two- and three-dimensional spaces, and analytical methods for describing geometric objects. Students study different forms of equations of a line in a plane, methods for determining angles between lines, and the practical application of analytical geometry in solving applied problems.	BD
24	Electrical Engineering and Fundamentals of Electronics	The discipline is aimed at developing students' knowledge of the theoretical foundations of electrical engineering and electronics, as well as practical skills in analyzing and applying electrical and electronic devices in modern information systems. The course covers the fundamental laws of DC and AC electrical circuits, methods for electrical circuit analysis and calculation, the operating principles of electrical measuring instruments, semiconductor devices, and electronic components, as well as the fundamentals of analog and digital electronics. Students study methods for analyzing and designing electrical and electronic circuits, the characteristics of electronic components, the operating principles of electronic devices, and their application in modern information, computing, and automated systems.	BD
25	Web Technologies	The discipline is focused on studying the architectural principles of the modern Internet, fundamental data transmission protocols, and infrastructure solutions. The course covers interaction models, web service standards (REST, SOAP, GraphQL), and principles of organizing and managing enterprise information resources. Students analyze OSI network layers in the context of the web, study authentication mechanisms, network security issues, and accessibility standards, and evaluate the effectiveness of using various web services for business tasks.	BD

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26	Generative Artificial Intelligence	generative artificial intelligence models to solve applied problems. It covers deep learning architectures underlying generative systems, including large language models (LLMs), diffusion models, and transformer architectures. Students analyze mechanisms of content generation (text, images, and source code), master model fine-tuning and prompt engineering techniques, and evaluate the quality, effectiveness, and ethical aspects of generative model applications. The course develops practical skills in designing and using generative AI solutions for business process automation and applied problem-solving, while adhering to the principles of academic integrity in the use and creation of digital content, independently mastering modern artificial intelligence technologies, and preparing results in accordance with academic writing standards.	BD
27	AI Visualization and Tools	The discipline is aimed at developing knowledge and practical skills in data visualization and the presentation of results of intelligent data analysis. The course covers modern methods and tools of data visualization, as well as technologies for creating charts, diagrams, dashboards, and interactive analytical panels. Students study approaches to the effective presentation of outputs generated by artificial intelligence systems, data analysis and interpretation, and principles of designing visual decision-support tools. Special attention is given to the use of modern software platforms for visual analytics and solving applied data-driven tasks.	BD
28	Software Engineering	The discipline is aimed at developing knowledge and practical skills in software development using modern tools for software design, modeling, and project maintenance. Students learn to design and implement complex software systems using procedural programming languages and study the principles of object-oriented programming and their application in developing efficient, reliable, and scalable software solutions. Special attention is given to the preparation of software and project documentation in accordance with academic writing standards, adherence to the principles of academic integrity in software development, and the development of skills for independently mastering modern software engineering technologies and tools.	PD
29	Computer Networks	The discipline is aimed at developing knowledge and practical skills in the design, implementation, and administration of computer networks. The course covers technologies for integrating local area networks with the global Internet, principles of data transmission in network environments, as well as the functionality of modern communication equipment and its implementation. Students study methods for analyzing and optimizing network traffic, tools for network monitoring, and approaches to improving the efficiency of network infrastructure. Special attention is given to the design of local area networks, ensuring their reliable integration with global networks, and maintaining secure network communications.	PD
30	Mobile Application Development	The discipline is aimed at developing knowledge and practical skills in mobile application development for modern mobile platforms. The course covers the fundamental principles of designing, developing, and maintaining applications for Android and iOS operating systems. Students study mobile software development technologies using programming languages such as Java and C#, master development tools, user interface design methods, and the specifics of integrating mobile applications with device hardware and software resources. Special attention is given to the development of functional, high-performance, and user-friendly mobile solutions that meet contemporary user requirements.	PD
31	Operations Research	The discipline is aimed at developing students' knowledge of operations research methods and mathematical modeling, as well as practical skills in developing and applying optimization models for solving applied problems. The course covers methods of linear, integer, and dynamic programming, transportation and network optimization problems, inventory management models, queuing systems, decision-making models, and game theory. Students study methods for developing mathematical models, analyzing and optimizing processes, as well as modern software tools for decision support and operations research. Special attention is paid to the application of operations research methods in data analysis, business process optimization, resource management, and the design of information systems.	PD

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32	Circuit Design	design, analysis, and development of electronic devices and circuits. The course covers modern electronic components, including resistors, transistors, integrated circuits, and microprocessors. Students master the principles of designing analog and digital electronic systems, methods for developing amplifiers, filters, and logic circuits, and acquire skills in using computer-aided design tools for modeling electronic devices and designing printed circuit boards. The acquired knowledge provides a foundation for further studies in robotics, automation, and computer systems architecture.	PD
33	IT Infrastructure	The discipline is aimed at developing knowledge and practical skills in information technology infrastructure and distributed information systems in a business environment. The course covers the principles of inter-network data exchange and distributed information processing, as well as business requirements for modern information systems. Students study system architecture models, including client-server and distributed systems, key networking technologies and protocols, and methods for designing, configuring, and administering network infrastructure. Special attention is given to information security, network management, and ensuring the reliability and efficiency of corporate information systems.	PD
34	Web Programming	The course is aimed at developing skills in designing and developing modern dynamic web applications. During the course, students design client-server application architectures, develop frontend user interfaces and backend business logic, and study modern programming languages, frameworks, and database management systems. Students acquire practical skills in developing responsive user interfaces, integrating external APIs, deploying and maintaining web applications, and ensuring their performance, security, and cross-browser compatibility. The course also develops the ability for independent learning of modern web technologies, adherence to the principles of academic integrity when developing software and using digital resources, and preparation of technical documentation in accordance with established requirements.	PD