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Higher and Postgraduate Educational Programs

☐Project EP ☐Participant of project EP

Date of registration in the Registry

28.07.2025

Registration number

6B06100383

Date of EP passport updating

14.07.2026 21:58

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

6B06105 Artificial Intelligence engineering

EP purpose

To train bachelor's degree specialists in the field of information and communication technologies, equipped with up-to-date practical skills in the development, implementation, and maintenance of artificial intelligence systems, including machine learning, data analysis, computer vision, and natural language processing — for effective application in various sectors of the economy.

EP type

Innovative EP

Level on NQF

6

Level on SQF

6

EP distinctive features

No

Language of education

Russian Kazakh English multilingual

Professional Standard for EP

Exists

№	Name of professional standard
1	Development of IoT systems
2	Development of artificial intelligence applications
3	Software development

Professional standards (career standards)

Professional standard has been used at developing EP ☒

Professional standard №1



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Approval year2022

CCEA

Professions

Profession №1

Profession

Инженер-программист IoT систем

Уровень по ОРК

6

Labor functions

Обеспечение взаимодействия и управления устройствами IoT

Совершенствование и проведение процедуры контроля работоспособности

Professional standard №2

Professional standard

Разработка приложений искусственного интеллекта

Approval year

2022

CCEA

Professions

Profession №1

Profession

Инженер по искусственному интеллекту

Уровень по ОРК

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Labor functions

Опытная эксплуатация систем искусственного интеллекта

Реализация систем искусственного интеллекта

Volume of the credits

240

Degree to be conferred

Bachelor

Period of study

4

Date of approval EP on the Academic Council

26.04.2026

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

The license number on the direction of training

KZ49LAM00007465 (004)

☐The training format is online

☒EP accreditation existence

Atlas of new professions

Инженер-разработчик искусственных нейронных сетей<https://atlasbt.enbek.kz/profession/65>

IoT-специалист<https://atlasbt.enbek.kz/profession/57>

Regional standard



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The formed educational outcomes

Nº	Educational outcome	Code	Reflects the labor function
1	Have the ability to evaluate and apply research	ON1	Обеспечение взаимодействия и управления устройствами IoT
2	Analyze system requirements, design,	ON2	Реализация систем искусственного интеллекта
3	Apply mathematical methods and computer	ON3	Обеспечение взаимодействия и управления устройствами IoT
4	Analyze software requirements, synthesize	ON4	Опытная эксплуатация систем искусственного интеллекта и ее внедрение
5	Create graphical solutions using modern digital	ON5	Реализация систем искусственного интеллекта
6	Use computer technologies in the design, development,	ON6	Совершенствование и проведение процедуры контроля работоспособности систем искусственного интеллекта Обеспечение взаимодействия и управления устройствами IoT
7	Evaluate requirements necessary for modeling and	ON7	Совершенствование и проведение процедуры контроля работоспособности систем искусственного интеллекта Реализация систем искусственного интеллекта
8	Synthesize concepts and methodologies for	ON8	Обеспечение взаимодействия и управления устройствами IoT Совершенствование и проведение процедуры контроля работоспособности систем искусственного интеллекта Опытная эксплуатация систем искусственного интеллекта и ее внедрение
9	Possess foreign language proficiency for social and	ON9	Реализация систем искусственного интеллекта Совершенствование и проведение процедуры контроля работоспособности систем искусственного интеллекта Опытная эксплуатация систем искусственного интеллекта и ее внедрение
10	Analyze and implement tasks that require natural	ON10	Опытная эксплуатация систем искусственного интеллекта и ее внедрение Совершенствование и проведение процедуры контроля работоспособности систем искусственного интеллекта
11	Design and develop mobile solutions using modern	ON11	Опытная эксплуатация систем искусственного интеллекта и ее внедрение Совершенствование и проведение процедуры контроля работоспособности систем искусственного интеллекта Реализация систем искусственного интеллекта

Data on disciplines

Nº	Name of discipline	Short description of discipline	Cycle
1	Fundamentals of Scientific Research	The course is aimed at studying the main theoretical principles, technologies, practical methods, and techniques for conducting scientific research based on the modern achievements of scholars. The discipline contributes to the development of students' scientific culture, enhances their skills in critical and flexible interpretation of scientific texts, promotes active participation in scientific discussions, and supports the effective application of acquired knowledge in research activities.	GED
2	Ilyastanu	The purpose of the discipline is to develop a deep-thinking personality with 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

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		 ЕДИНАЯ ПЛАТФОРМА ВЫСШЕГО ОБРАЗОВАНИЯ	English 	
3	Fundamentals of Financial Literacy	of law, the basics of anticorruption culture, as well as the regularities of the emergence, development and functioning of the state and law. The course develops anticorruption culture skills and a high level of theoretical knowledge of the main functions of law in the state and society, its influence on the development of the rule of law and civil society.	GED	
4	Basics of Law and Anti-Corruption Culture	The objective is to familiarize students with the fundamental branches and institutions of law, the foundations of anti-corruption culture, as well as the patterns of emergence, development, and functioning of the state and law. The course cultivates anti-corruption awareness and a high level of theoretical knowledge concerning the primary functions of law within the state and society, its impact on the development of the rule of law and civil society, and the value of inclusion as an integral component of a just and equitable legal order. Particular emphasis is placed on fostering students' understanding of the importance of human rights for all individuals, regardless of their social, cultural, physical, or other characteristics.	GED	
5	Ecology and Life Safety Basics	Purpose – the goal is to develop knowledge of the fundamentals of ecology, sustainable development, and life safety, enabling the analysis of ecological processes, the assessment of the socio-environmental consequences of anthropogenic activities, the assurance of environmental safety, and the application of methods and technologies for protection in emergency situations. Develops the ability to assess the impact of environmental factors on human health; to forecast ecological processes for planning and implementing measures aimed at enhancing life safety and ensuring environmental security; and to make informed decisions in adverse environmental and emergency situations, taking into account the potential consequences of accidents, disasters, and natural hazards within the framework of sustainable development principles.	GED	
6	Economics and Entrepreneurship	Objective – to familiarize students with the economic challenges of modern society, develop economic thinking, and provide knowledge of the theoretical foundations and practical skills in the field of entrepreneurship. The program is aimed at forming a comprehensive understanding of the functioning of the economy, while delivering business education focused on acquiring applied competencies in various areas of entrepreneurial activity. Special attention is given to issues of sustainable development, efficient resource use, and the implementation of lean production principles as key elements of effective and environmentally responsible business practices. The course also explores the specifics of creating and successfully managing a business, taking into account modern requirements for environmental and social responsibility in entrepreneurship.	GED	
7	Professional Terms in the Field of Information Systems	The course develops English language skills to a necessary and sufficient level of communicative competence, enabling the use of the foreign language in various areas of official and business communication, professional activities, scientific and practical work, interaction with international partners, as well as for self-education and other purposes.	BD	
8	Designing Cloud Solutions	The course aims to develop students' systemic understanding of the principles of designing, developing, and implementing cloud solutions using modern approaches and technologies. The goal of the course is to teach how to create scalable, fault-tolerant, and secure cloud architectures based on business requirements and technical constraints.	BD	
9	Data Analytics	The discipline forms theoretical knowledge of modern principles, methods and tools of data analysis, practical skills and abilities to apply modern methods of data analysis in information systems.	BD	
10	Discrete Mathematics and Mathematical Logic	Formation of fundamental knowledge in the field of discrete mathematics and mathematical logic, necessary for formalization, analysis and solution of problems related to logical, combinatorial and structural modeling in the field of computer science, programming, cybernetics and related disciplines.	BD	
11	Database Theory and Design	The course is dedicated to the study of fundamental database theory and methods for designing efficient data storage systems. It covers key aspects such as normalization, creation of logical and physical database schemas, and query development for data manipulation. The course aims to develop skills in database design, optimization, and ensuring data integrity.	BD	

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12	Computational Mathematics	numerical modeling, algorithmization and application of numerical methods to solve applied problems arising in artificial intelligence systems, machine learning and data mining.	BD
13	Introduction to Artificial Intelligence	The course aims to develop students' basic understanding of the concepts, methods, and technologies of artificial intelligence (AI), as well as to enhance their skills in applying AI techniques to solve practical problems. It is designed to provide a theoretical and practical foundation for further study of specialized subjects such as machine learning, deep learning, natural language processing, and other AI-related fields.	BD
14	Practicum on AI Model Development	The course is aimed at developing and applying machine learning and deep learning models using the TensorFlow library in the Python environment. The TensorFlow library in Python focuses on the fundamentals of machine learning and deep neural networks. The course covers environment setup and configuration, working with tensors, building and training models, convolutional and recurrent neural networks, image and text processing, model saving and deployment, as well as practical projects in Python.	BD
15	Machine Learning	Developing students' theoretical knowledge and practical skills in machine learning, understanding the principles behind algorithm operation, and enhancing the ability to apply machine learning methods to solve real-world problems involving data analysis, forecasting, and decision automation.	BD
16	Neural Networks	The course is focused on studying the basic principles of operation and architecture of neural networks. During the course, students will master both theoretical foundations and practical aspects related to the structure and functional capabilities of neural networks. The goal of the course is to develop a comprehensive understanding of neural networks as a universal tool for information analysis and processing. Students will become familiar with basic concepts such as artificial neurons, network layers, activation functions, backpropagation algorithms, and optimization methods. Various types of neural networks will also be examined.	BD
17	Object-Oriented Programming	Formation of students' theoretical knowledge and practical skills of software design, development and maintenance using object-oriented programming paradigm. Mastering the principles of OOP contributes to the creation of modular, scalable and reusable software solutions.	BD
18	Introduction to Programming Languages	The course is designed to provide students with basic knowledge and skills in software development. The course covers fundamental programming concepts, including working with variables, operators, conditions, loops, functions, arrays and data structures. Emphasis is placed on logical thinking, algorithmic approach to problem solving and writing readable, correct and efficient code. The discipline covers the basics of structural and procedural programming, as well as the first ideas about the principles of object-oriented approach.	BD
19	Web Application Development	A course that studies the process of creating web applications for the internet. Within this course, students learn the fundamental concepts and technologies used to build modern websites and applications. During the training, students practice designing user interfaces, optimizing performance, and ensuring the security of web applications.	BD
20	3D Modeling	The course covers the fundamentals of modern 3D graphics and animation, including mastering the principles of operation and basics of modeling. A key objective of the course is to acquire solid knowledge and practical skills in using new technologies for collecting and processing spatial data, as well as creating three-dimensional objects.	BD
21	Modeling of Information Processes and Systems	The course covers the main classes of models and modeling methods, principles of constructing models of information processes, methods of formalization, algorithmization, and implementation of models using modern computer tools, methods for conducting computational experiments using simulation modeling techniques.	BD

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34	Computer Vision 1	covers the basics of image processing (noise reduction, color correction, edge detection), image classification (key functions), and content-based image retrieval (descriptor compression, approximate methods for descriptor comparison).	PD
35	Computer Vision 2	The course is dedicated to an in-depth study of methods and technologies used to solve complex computer vision tasks, such as 3D image processing, real-time object detection, as well as enhancement and optimization of algorithms for handling large datasets. The course covers advanced approaches, including the use of convolutional neural networks (CNNs), generative models, and deep learning techniques to address more complex problems.	PD
36	Research Methodology Based on Artificial Intelligence	Developing students' systematic understanding of scientific research methodology through artificial intelligence technologies, as well as cultivating their skills in applying AI methods and algorithms for data analysis, pattern recognition, forecasting, and decision-making support in scientific research.	PD
37	Intelligent Robotic Systems	The course is dedicated to the fundamentals of the theory and methodology for creating intelligent systems and robotic complexes. It covers the basics of intelligent systems theory, including knowledge representation and problem-solving methods. The course also provides methodology and examples of expert system development.	PD
38	Neural Networks and Text Processing	The course focuses on studying neural networks and their application for processing textual information. It covers the fundamentals of working with neural networks, including architectures of deep neural networks, recurrent neural networks (RNN), and transformers. The course also includes the study of natural language processing (NLP) methods, such as text analysis, classification, information extraction, and text generation using modern technologies. This knowledge is essential for developing intelligent systems and applications focused on working with text, which is relevant for professional activities in the field of artificial intelligence and data processing.	PD
39	NLP and Operational Management	The goal of the discipline is to master the theory and practice of natural language processing. The course covers theoretical aspects of NLP, including basic information from the field of linguistics, as well as practical methods of text processing using natural language tools and system queries to solve practical problems based on NLP.	PD
40	AI in Industry and Research	Forming a systematic understanding of the methods and technologies of artificial intelligence (AI) and their application in industrial automation, production process control, technical diagnostics, as well as in scientific research and engineering data analysis. Special attention is paid to the practical use of machine learning algorithms, intelligent information processing and modeling.	PD
41	Recurrent Neural Networks (RNN)	The course is aimed at studying the theoretical foundations and practical methods for building and training recurrent neural networks for sequential data processing. It covers RNN, LSTM, and GRU architectures, training methods for temporal models, working with time series and sequences, and the application of recurrent networks in natural language processing, speech recognition, forecasting, and data analysis tasks. Special attention is given to implementing models in Python using modern deep learning libraries and evaluating their effectiveness on practical tasks.	PD
42	Deep Learning	The course focuses on the theoretical foundations and practical methods of building, training, and applying deep neural networks. It covers key deep learning architectures, including convolutional and recurrent neural networks, as well as optimization, regularization, and hyperparameter tuning techniques. The discipline develops professional competencies in artificial intelligence and intelligent software solution development.	PD
43	Big Data	A discipline aimed at studying methods for storing, processing and analyzing large volumes of data that cannot be processed by traditional means. The course covers the features of working with structured and unstructured data, the basics of distributed computing, Hadoop, Spark technologies, NoSQL databases (for example, MongoDB, Cassandra), as well as data visualization and analysis tools. Particular attention is paid to the practical application of Big Data in business, science and industry.	PD

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44	Mobile Application Development for Android	development for the Android operating system, including both frontend and backend programming. During the course, students learn the basics of the Kotlin (or Java) programming language, working with the Android Studio development environment, and the principles of designing a user interface using XML and Jetpack Compose.	PD
45	Programming in the ARDUINO Environment	The course aims to develop students' theoretical knowledge and practical skills in programming microcontrollers within the ARDUINO integrated development environment. It also focuses on building competencies in designing and implementing devices based on the ARDUINO hardware platform to solve tasks related to automation, control, sensing, and interaction with external devices.	PD
46	Blockchain Technologies	The course is focused on studying the mathematical algorithm of Blockchain. Blockchain is a mathematical algorithm that enables secure and private data exchange through peer-to-peer networks. The main idea of Blockchain technology is a chain of blocks containing information about each transaction, stored across all nodes in the network. Blockchain ensures efficient and reliable data protection, as well as transparent and tamper-resistant information exchange. The discipline covers mathematical methods related to elliptic curve cryptography and software development techniques for Blockchain systems using Java and Python. The course also introduces students to the fundamentals of Blockchain across various platforms.	PD
47	Mobile Application Development for iOS	The course is dedicated to developing iOS applications on Swift using Xcode. Students study architecture and OS, creating interfaces with SwiftUI and programming using UIKit, working with the API, data storage, the basics of testing and publishing in the app store based on Apple's human interface recommendations.	PD
48	Development of Web Application Based on the Spring Framework	The discipline is designed to improve web application development skills, allowing students to learn markup languages and technologies, fundamental concepts of server-side programming, client-side programming using scripting languages, create HTML documents containing simple scripts, and develop server applications.	PD
49	Web Programming	Mastering the discipline "Web Programming" is aimed at developing students' theoretical knowledge of Internet programming and practical skills in web application development. The course covers modern technologies for creating web pages, principles of designing the client and server sides of web applications, as well as methods of effective use and integration of various web technologies. Students acquire skills in designing, developing, and optimizing interactive web resources using modern programming tools.	PD