



announcement.title

Registry of the EP ▾

Submission of applications

Registry of educational programs

OVPO passport

Administrative reports

Support

Back

Higher and Postgraduate Educational Programs

☐Project EP ☐Participant of project EP

Date of registration in the Registry

24.12.2021

Registration number

6B06100288

Date of EP passport updating

30.07.2026 10:38

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

6B06104 Designing SMART systems

EP purpose

Training of personnel in the field of information and communication technologies based on a multidisciplinary approach to acquire fundamental knowledge and practical analysis skills in the development, management of Internet systems and services using SMART technology.

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	Software testing
2	System and network administration
3	System analysis in information and communication technologies

Professional standards (career standards)

Professional standard has been used at developing EP ☒

Professional standard №1



announcement.title

Registry of the EP

Submission of applications

Registry of educational
programs

OVPO passport

Administrative reports

Support

Approval year

2022

CCEA

Professions

Profession №1

Profession

Инженер-программист

Уровень по ОРК

6

Labor functions

Составление алгоритма и создание блок схемы на основе с
Написание кода и разработка программы для ПО

Profession №2

Profession

Дизайнер программного обеспечения

Уровень по ОРК

6

Labor functions

Прототипирование ПО
Руководство программированием программного обеспечения и разработ
Проектирование ПО

Volume of the credits

240

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 (004)

☐The training format is online

☐EP accreditation existence

Atlas of new professions

<https://atlasbt.enbek.kz/profession/62> Разработчик универсального ИИ

Regional standard

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

Инженер по Smart системам;

Инженер по IoT

The formed educational outcomes

№	Educational outcome	Code	Reflects the labor function
1	Use financial instruments in practice when	ON1	Руководство программированием программного обеспечения и разра Проектирование ПО

announcement.title

Registry of the EP

Submission of applications

Registry of educational programs

OVPO passport

Administrative reports

Support

ЕДИНАЯ ПЛАТФОРМА
ВЫСШЕГО ОБРАЗОВАНИЯ

English

2	TO evaluate a holistic view of the basic concepts and	ON2	Составление алгоритма и создание блок схемы на основе специфика
3	Modify existing software to correct errors, adapt to	ON3	Написание кода и разработка программы для ПО Составление алгоритма и создание блок схемы на основе специфика
4	Design information models using modern	ON4	Написание кода и разработка программы для ПО Проектирование Г
5	Have the ability to evaluate and apply	ON5	
6	Possess the means and programming	ON6	Руководство программированием программного обеспечения и разра Написание кода и разработка программы для ПО
7	Develop technical requirements for	ON7	Составление алгоритма и создание блок схемы на основе специфика Прототипирование ПО
8	Develop computer networks based on the	ON8	Написание кода и разработка программы для ПО Проектирование Г
9	Speak a foreign language in the professional field of	ON9	Руководство программированием программного обеспечения и разра Проектирование ПО
10	Analyze the effectiveness of the application of	ON10	Проектирование ПО Написание кода и разработка программы для Г
11	Possess the methods and ability to collect and	ON11	Проектирование ПО Написание кода и разработка программы для Г
12	Conduct qualitative mathematical and	ON12	Составление алгоритма и создание блок схемы на основе специфика Руководство программированием программного обеспечения и разра

Data on disciplines

Nº	Name of discipline	Short description of discipline	Cycle
1	Fundamentals of Scientific Research	The goal is to form knowledge about the principles, technologies, practical methods and techniques of conducting scientific research based on modern achievements of scientists. Forms the basic foundations of scientific culture and ethics, flexible perception of scientific texts, skills of effective application of acquired knowledge in planning and organizing research work, the ability to analyze and summarize research results.	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
3	Fundamentals of Financial Literacy	The course is aimed at gaining knowledge and skills in the field of personal finance management. Also, as part of the course, students will learn how to use in practice all kinds of tools in the field of finance, save and increase savings, plan a budget competently, learn how to analyze financial information and navigate financial products to choose an adequate investment strategy.	GED

- announcement.title
- Registry of the EP
- Submission of applications
- Registry of educational programs
- OVPO passport
- Administrative reports

4	Basics of Law and Anti-Corruption Culture	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	Computational Mathematics	The discipline is aimed at studying numerical methods for solving mathematical problems using computer technologies, mastering methods for approximate solving of equations, interpolation, numerical integration and differentiation, solving systems of linear and nonlinear equations, as well as mathematical physics problems. Special attention is paid to algorithm development, evaluation of computational accuracy, and practical implementation of numerical methods using programming languages.	BD
8	Professional Terms in the Field of Information Systems	Studies English as a necessary and sufficient level of communicative competence, which will allow to use a foreign language in various fields of official business, professional activity, in scientific and practical work, in communication with foreign partners, for self-education and other purposes.	BD
9	Discrete Mathematics and Mathematical Logic	Within the framework of the course, the basic concepts of number systems, the main concepts and methods of set theory and combinatorics, the basic concepts and methods of graph theory, as well as elements of coding theory are considered. The course covers methods of converting numbers from one number system to another, representing statements in the formal language of propositional logic, solving basic combinatorial problems, and performing elementary operations on graphs.	BD
10	Introduction to Artificial Intelligence	The discipline is aimed at studying the theoretical foundations of the development and functioning of artificial intelligence systems, modern technologies for designing intelligent systems, the main research areas in artificial intelligence, knowledge representation methods, the principles of organizing knowledge bases and expert systems, their types and application features, as well as image recognition technologies.	BD
11	Computer Networks	The discipline is aimed at mastering the principles of organization and functioning of computer networks, studying the features of personal computer operation in a network environment, modern network technologies and methods of information transmission, storage, retrieval, processing and presentation, as well as developing practical skills in working with local computer networks.	BD

- announcement.title
- Registry of the EP
- Submission of applications
- Registry of educational programs
- OVPO passport
- Administrative reports

12	Introduction to Programming Languages	theoretical and practical foundations of programming. It covers key concepts such as algorithm development, variables and data types, arithmetic and logical operators, conditional statements, and loops. Students learn how to create functions, work with modules, and organize program structure effectively. The course also provides an overview of different programming languages and their characteristics. Practical exercises help develop logical thinking and problem-solving skills. This course lays the foundation for working with more complex software systems in the future.	BD
13	Signals and Systems	The discipline is aimed at studying the theoretical and practical foundations of signal representation, analysis, transformation, and processing in digital systems, mastering the main types of signals, their characteristics and methods of mathematical description, as well as the principles of operation of linear and nonlinear systems. Special attention is paid to signal analysis methods in the time and frequency domains, signal sampling and quantization processes, and digital data processing technologies.	BD
14	Fundamentals of Electronics	The discipline is aimed at studying the principles of construction, structure and organization of intelligent and smart systems. Within the framework of the course, architectural models of intelligent systems, methods of knowledge representation, interaction of software and hardware components, basics of artificial intelligence, as well as principles of integration of intelligent modules into smart infrastructure are considered. Particular attention is paid to the design of adaptive, distributed and autonomous systems for IoT, robotics and digital platforms. The discipline forms students' skills in analyzing and designing intelligent solutions necessary for further study of disciplines related to machine learning.	BD
15	3D Modeling	The aim of the course is to study a graphic editor, with the help of which it is possible to model three-dimensional images of objects, as well as basic concepts of animation programs and fundamental tools, which are necessary for creating three-dimensional characters and animations. This discipline occupies an important place in the system of knowledge, forming a modern approach to creativity with the help of computer technologies.	BD
16	Fundamentals of Cloud Technologies	The discipline is aimed at developing students' knowledge of the basic principles and approaches of system analysis and design that enable the study of complex information systems, developing skills in applying acquired knowledge for the system analysis of business processes, and mastering methods for using modern tools of system analysis and business process design.	BD
17	Vector and Raster Graphics	Provides for the theoretical study and practical development of the basics of computer graphics, the study of computer technologies for the processing of graphic information, since professional activities of a modern specialist in the field of information technology is associated with the widespread practical application of various methods of computer processing of graphic information.	BD
18	Computational Physics	The discipline is aimed at developing students' professional competencies in applying modern theoretical concepts of computational physics, acquiring theoretical knowledge and practical skills in developing and applying physical and mathematical models and numerical methods for solving fundamental and applied physical problems, as well as modeling physical processes and systems.	BD
19	General Physics	The discipline is aimed at studying matter and energy, the fundamental interactions of nature that govern the motion of matter, as well as developing students' modern understanding of the physical picture of the world, research skills, abilities to obtain and process experimental results, and apply methods of modeling physical processes in solving specific problems.	BD
20	Project Studies	The course is aimed at developing students' ability to form independent theoretical and practical judgments, objectively evaluate scientific information, exercise freedom in scientific inquiry, and apply scientific knowledge in educational activities, including during the preparation of a thesis (final project).	BD

announcement.title

Registry of the EP

Submission of applications

Registry of educational programs

OVPO passport

Administrative reports

Support

ЕДИНАЯ ПЛАТФОРМА ВЫСШЕГО ОБРАЗОВАНИЯ English			
21	Programming in High Level Language	complex programs using modern tools of the high-level C# language, master modern technologies for creating programs in the C# programming language, and will be able to test and verify programs.	BD
22	Engineering and Computer Graphics	The discipline includes three sections: descriptive geometry, engineering graphics and computer graphics. Descriptive geometry deals with questions about the subject and method of descriptive geometry. Engineering graphics considers issues related to design documentation, design drawings, in the AutoCAD computer-aided design system.	BD
23	Intelligent Robotic Systems	The course covers the principles of building the architecture of intelligent control systems for mobile robots, the main models and approaches underlying the modules of the intelligent control system for mobile robots. Principles of distributed management. Aspects of designing and creating software for mobile robots, unmanned vehicles, and robotic complexes.	BD
24	Programming Technology	As a result of studying the «Programming Technology» discipline, students will gain competence in organizing data structures, developing structural diagrams of algorithms for solving set problems, knowing how to choose a programming language, using it as a means of solving a set task, debugging and testing developed programs, and using methods for compiling high-quality software documentation.	BD
25	Digital Animation Technology	Introduces the student to the basic digital technologies necessary for the implementation of projects in various areas of design. Forms the initial skills of using application programs in the field of raster, vector and 3D graphics; animation; video and audio editing; web design, presentation graphics, etc.	BD
26	Development of Electronic Courses	The discipline is aimed at studying the methods of preparation and use in the educational process of electronic courses; technologies of collective creation and sharing of electronic documents and audio-visual materials for their application in the educational process and scientific research.	BD
27	Programming in the ARDUINO Environment	System analysis of the applied area, formalization of solving applied problems and processes of information systems; development of projects for automation and informatization of applied processes and creation of information systems in applied areas; performing work on the creation, modification, implementation and maintenance of information systems and managing these works.	BD
28	DevOps and Cloud Management	The discipline is aimed at studying modern approaches to the development, deployment and maintenance of software systems using cloud technologies. Within the framework of the course, principles of DevOps culture, automation of development and testing processes, continuous integration and delivery of software (CI/CD), containerization and orchestration of applications are considered. Particular attention is paid to working with cloud platforms, virtual infrastructure management, ensuring scalability, fault tolerance and security of services.	BD
29	Architecture of Intelligent Systems	The discipline is aimed at studying the principles of construction, structure and organization of intelligent and smart systems. Within the framework of the course, architectural models of intelligent systems, methods of knowledge representation, interaction of software and hardware components, basics of artificial intelligence, as well as principles of integration of intelligent modules into smart infrastructure are considered. Particular attention is paid to the design of adaptive, distributed and autonomous systems for IoT, robotics and digital platforms. The discipline forms students' skills in analyzing and designing intelligent solutions necessary for further study of disciplines related to machine learning.	PD
30	Software Development Methods	The content of the discipline is aimed at studying the concepts, methodologies and methods of programming. This course aims to teach students the popular principles, tools, and techniques used for effective software development. Requirements analysis, UML, object-oriented analysis, design and programming, use of application programming interfaces (APIs), software maintenance, project management.	PD



 announcement.title

 Registry of the EP

Submission of applications

Registry of educational programs

 OVPO passport

 Administrative reports

 Support

31	Database Theory and Design	information repositories, data warehouses and databases, basic data organization models, the relational model, database typology and classification, principles of database design, as well as the life cycle of information systems using databases; mastering the main methods and tools for database management and developing applications based on client-server technologies.	PD
32	Practicum on AI Model Development	The discipline is aimed at the development and application of machine and deep learning models using the TensorFlow library in the Python environment. The course is oriented toward mastering the basics of machine learning and deep neural networks. Installation and configuration of the environment, work with tensors, creation and training of models, convolutional and recurrent neural networks, image and text processing, saving and deployment of models, as well as execution of practical projects in Python are considered.	PD
33	Internet of Things	The content of the discipline is aimed at studying the main technologies of the Internet of Things, software and hardware tools for context perception; methods of programming Intel Edison devices in Python; principles of building IoT class systems; solve practical issues of planning, design, development, integration and operation of IoT class information systems.	PD
34	Computer Vision	The discipline introduces technologies for integrating local area networks into the global Internet and data transmission in global networks; functional capabilities of communication equipment and technologies for its implementation; tools for analyzing network traffic and methods of its optimization; fundamentals of designing local networks and their integration into global networks.	PD
35	Machine Learning	Formation of students theoretical knowledge and practical skills in the basics of machine learning, mastering the tools, models and methods of machine learning, as well as acquiring the skills of a data scientist and a developer of mathematical models, methods and algorithms for data analysis.	PD
36	Object-Oriented Programming	As a result of studying the "Object-Oriented Programming" discipline, students will receive the competence of the theoretical principles of object-oriented programming, the use of modern methods and tools for developing algorithms and programs, the ability to apply modern object-oriented programming technologies in solving complex applied problems when creating information systems.	PD
37	IT Project Management	The discipline is aimed at studying modern methods and tools of planning, organization, implementation and control of projects in the field of information technologies. Within the framework of the course, the life cycle of an IT project, methods of managing resources, timeframes, risks and quality, as well as issues of teamwork and interaction with the customer are considered.	PD
38	SMART Systems Security	The purpose of the discipline "SMART Systems Security" is the formation of professional knowledge in the field of building a comprehensive protection system. The study of current trends in international and domestic standards in the field of information security; the construction of information security systems of the organization; the development of an effective security policy and program depending on the objects of protection, the degree of its confidentiality.	PD
39	Smart City Technologies	The discipline is aimed at studying modern digital solutions and intelligent systems used for managing urban infrastructure and increasing the quality of life of the population. Within the framework of the course, concepts of a "smart city", Internet of Things (IoT) technologies, big data (Big Data), artificial intelligence, cloud computing, intelligent transportation systems, energy-efficient solutions and digital urban management services are considered. Particular attention is paid to the issues of automation of urban processes, information security, sustainable development and the introduction of innovative technologies in the fields of transport, ecology, healthcare, education and public utilities.	PD

announcement.title

Registry of the EP

Submission of applications

Registry of educational programs

OVPO passport

Administrative reports

40	Web Application Development	will allow you to study markup languages (HTML, XML) and technologies related to (CSS, XHTML, AJAX), basic concepts of server-side programming (PHP, JSF), client-side programming using scripting languages, create HTML documents containing simple scripts; develop server applications.	PD
41	Extended NoSQL Databases	Methodology of database design for NoSQL systems. The approach is based on NoAM (NoSQL Abstract Model), a new abstract data model for NoSQL databases that uses common features of various NoSQL systems and is used to define a system-independent data representation application. In general, the methodology aims to support the scalability, performance, and consistency needed for next-generation web applications.	PD
42	Mobile Application Development	The discipline considers basic principles of creating applications for the Android and iOS operating systems, as well as mobile application development technologies using Java and C# languages for Android and iOS platforms.	PD
43	Recurent Neural Networks	The discipline is aimed at studying the main architectures of neural networks, methods of their configuration (adaptation), testing and control, mastering the methodology for synthesizing neural network structures to solve applied problems, as well as exploring the prospects for the development of neural network theory.	PD
44	Deep Learning	The discipline is aimed at studying the theoretical foundations and practical methods of building, training and applying deep neural networks. Within the framework of the course, basic deep learning architectures are considered, including convolutional and recurrent neural networks, methods of optimization, regularization and hyperparameter tuning. The discipline forms professional competencies in the field of artificial intelligence and development of intelligent software solutions among learners.	PD
45	Big Data and Cloud Computing	The study of the discipline is aimed at training scientific and pedagogical specialists in the field of ICT, as well as managers and analytical specialists in demand in IT companies and large industrial enterprises, where regular analysis of large volumes of data is required. The discipline develops skills in organizing processes for optimal data collection, real-time data processing, data analysis, business process optimization, consumer behavior forecasting, statistical indicators analysis, risk assessment, and business solution development.	PD
46	AR/VR Technologies	The discipline is aimed at studying the principles of developing and applying augmented and virtual reality technologies, mastering methods for creating interactive three-dimensional environments, the fundamentals of object modeling and visualization, as well as working with modern AR/VR software and hardware tools. Special attention is paid to designing user interfaces for immersive systems and developing skills in creating AR/VR applications for education, medicine, industry, gaming, and other areas of digital technologies.	PD