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Higher and Postgraduate Educational Programs

☐ Project EP ☐ Participant of project EP

Date of registration in the Registry

24.07.2019

Registration number

6B05200016

Date of EP passport updating

08.07.2026 22:31

Field of education

6B05 Natural Sciences, Mathematics and Statistics

Direction of personnel training

6B052 Environment

Group of educational programs

B051 Environment

Educational program

6B05201 Ecology

EP purpose

Training of professionally competent specialists of a new formation, in demand on the labor market in the field of education, upbringing and environmental protection.

EP type

Acting EP

Level on NQF

6

Level on SQF

6

EP distinctive features

No

Language of education

Russian

Kazakh

Professional Standard for EP

Exists

№	Name of professional standard
1	Geoecological research (Geoecologist)

Professional standards (career standards)

Professional standard has been used at developing EP



Professional standard №1

Professional standard

Геоэкологические исследования (Геоэколог)



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CCEA

Professions

Profession №1

Profession

Геолог-эколог

Уровень по ОРК

6

Labor functions

- Обеспечение соответствия заданий исполнителям программе инженерно-экологичес
- Подготовка геологического отчета
- Руководство производством полевых и камеральных работ в ходе инженерно-экологичес

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

☐The training format is online

☒EP accreditation existence

Atlas of new professions

не предусмотрено

Regional standard

не предусмотрено

The formed educational outcomes

№	Educational outcome	Code	Reflects the labor function
1	Evaluate the	ON1	Руководство производством полевых и камеральных работ в ходе инженерно-экологичес
2	To conduct	ON2	Руководство производством полевых и камеральных работ в ходе инженерно-экологичес
3	To evaluate	ON3	Подготовка геологического отчета
4	To predict,	ON4	Руководство производством полевых и камеральных работ в ходе инженерно-экологичес
5	To know	ON5	Руководство производством полевых и камеральных работ в ходе инженерно-экологичес



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6	Have the	ON	Подготовка геологического отчета
7	Analyze the	ON	Руководство производством полевых и камеральных работ в ходе инженерно-экологичес Обеспечение соответствия заданий исполнителям программе инженерно-экологических
8	To assess	ON	Организация выполнения конкретного вида инженерно-экологических изысканий Руководство производством полевых и камеральных работ в ходе инженерно-экологичес
9	Be able to	ON	Руководство производством полевых и камеральных работ в ходе инженерно-экологичес Подготовка геологического отчета
10	Assess the	ON	Обеспечение соответствия заданий исполнителям программе инженерно-экологических
11	Apply knowle	ON	Подготовка геологического отчета Руководство производством полевых и камеральных работ в ходе инженерно-экологичес
12	To ensure	ON	Организация выполнения конкретного вида инженерно-экологических изысканий Руководство производством полевых и камеральных работ в ходе инженерно-экологичес

Data on disciplines

Nº	Name of discipline	Short description of discipline	Cycle
1	Methods 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 IlyasZhansugurov. Forms an understanding of the importance of the works of IlyasZhansugurov 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
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

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5	Ecology and Life Safety Basics	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	Low-Waste and Non-Waste Technologies	Within the discipline, issues related to the improvement of technological processes, enhancement of product quality, production greening, and rational water resource management are considered. Special attention is given to the development of technological processes that are economically and environmentally efficient and competitive in the global market. The discipline aims to provide knowledge and skills required for the development of low-waste and waste-free electroplating technologies. In addition, combined methods for the treatment of electroplating rinse waters in closed-loop water circulation systems are studied.	BD
8	Fundamentals of Artificial Intelligence	The discipline is aimed at studying the basic concepts, methods and algorithms that underlie the creation and application of artificial intelligence. As part of this course, students will learn the theoretical foundations of machine learning, neural networks, natural language processing algorithms, and computer vision. They will also get acquainted with the ethical, social and legal aspects of the application of artificial intelligence in various areas of life.	BD
9	Environmental Documentation in Enterprises	Within the discipline, types of environmental activities are studied, along with the principles and rules of environmental protection. The course examines regulatory and technical documentation in the field of environmental protection, including environmental quality standards. Special attention is given to environmental impact assessment (EIA) as a tool for analyzing and regulating the environmental consequences of economic activities.	BD
10	Rational Use of Natural Resources	Within the discipline, the principles of rational use and conservation of natural resources are examined, focusing on reducing resource consumption and ensuring the restoration of renewable resources. The course studies methods for monitoring the condition and quality of natural resources, as well as approaches to their protection during economic activities. Special attention is given to improving technologies for the extraction, transportation, and processing of natural resources, ensuring their efficient utilization while incorporating environmental impact assessment requirements. The discipline also addresses strategies for reducing industrial waste generation, applying waste treatment and neutralization technologies, and developing knowledge on biodiversity conservation through the establishment of specially protected natural areas free from economic activity.	BD

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		  ЕДИНАЯ ПЛАТФОРМА ВЫСШЕГО ОБРАЗОВАНИЯ	English 	
11	Ecology of Soils	biosphere, and its contribution to biodiversity conservation are studied. The course examines soil-forming processes, the main properties of soils, and the influence of environmental factors on them. Special attention is given to soil fertility, soil profile structure and its types, as well as the particle size (granulometric) composition of soils and their classification by mechanical composition. The discipline also covers the mineralogical composition of soils and its significance in the formation of soil properties.	BD	
12	Ecology and Sustainable Development	Within the discipline, the fundamental patterns of interaction between living organisms and their environment are studied, environmental issues resulting from anthropogenic impacts are analyzed, and the key tasks and priorities of environmental protection activities are examined. The discipline contributes to the development of environmental awareness and an understanding of the principles of sustainable development.	BD	
13	Research Methods in Ecology	Within the discipline, methods of environmental research, contemporary issues in environmental science, and the characteristics of various research approaches are studied. Special emphasis is placed on improving environmental literacy, developing environmental awareness, and fostering a responsible attitude toward the environment. The course provides knowledge and skills for organizing preventive measures aimed at avoiding environmental disasters, while promoting compliance with environmental norms and principles of sustainable interaction between humans and nature.	BD	
14	Environmental Education and Upbringing	Within the discipline, the continuous process of teaching, upbringing, and personal development is examined, aimed at forming a system of scientific and practical knowledge and skills, as well as value orientations, behavior, and activities. The integrative role of environmental education within the general secondary education system is studied. The discipline develops general learning and universal human skills for predicting one's own activities and those of others. Single-subject, multi-subject, and mixed models of environmental education are also considered.	BD	
15	Environmental Cartography	Within the discipline, knowledge, competencies, and professional skills are developed in the application of cartographic research methods for assessing environmental conditions. The course covers the fundamentals of environmental mapping, methodologies for creating ecological maps, and their use in supporting decision-making in natural resource management and environmental policy. Particular attention is given to the themes, content, and methods of developing integrated environmental maps at global, regional, and local levels.	BD	
16	Artificial Intelligence-Based Environmental Safety Technologies	Within the discipline, methods of protecting the environment and humans from the negative impacts of economic activities and natural processes are studied. Students are introduced to the fundamentals of environmental safety, modern environmental risks, and regulatory and legal acts in the field of environmental protection. The course examines methods for assessing, preventing, and minimizing environmental threats.	BD	
17	Human Ecology	Within the discipline, the historical development of human ecology, its relationship with other scientific fields, and the basic concepts of the environment and its components are examined. The course studies the causes of the environmental crisis induced by human activity and the ways to overcome it. Special attention is given to environmental protection issues, including international aspects, the development of environmental awareness, and environmental education. The discipline also covers the foundations of socio-environmental policy and the role of public environmental movements.	BD	



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18	Social Ecology and Sustainable Development	relationship with other sciences, and its fundamental laws are examined. The concept of the environment and its components, as well as the nature of the environmental crisis and ways to overcome it, are studied. Special attention is given to environmental protection issues, including international aspects, the formation of environmental awareness and environmental education. The course also covers the foundations of socio-environmental policy and the activities of public environmental movements.	BD
19	Origin and Evolution of the Biosphere	Within the discipline, the main stages of biosphere evolution and the patterns of the origin, development, and distribution of life on Earth are studied. The composition, structure, and boundaries of the biosphere, as well as the interactions among its major components, are examined. The course also covers energy flows, productivity formation, biomass accumulation processes, and the dynamics of the biosphere. Special attention is given to the factors that ensure the stability and sustainability of the biosphere.	BD
20	Planning and Organization of Scientific and Research Works	Within the discipline, skills in processing statistical data and interpreting obtained results are developed. Students are introduced to basic and modern models of environmental processes. The course covers types of environmental activities, principles and rules of environmental protection, as well as regulatory and technical documentation, including environmental quality standards.	BD
21	Ecological Basis of Agriculture and Soil Protection	Within the discipline, the processes of organic matter synthesis in agroecosystems are studied, along with its transformation into complex organo-mineral compounds, including decomposition, mineralization, and humification processes. The course examines resource renewal, achieving high crop yields without the use of chemical inputs, and modern environmentally oriented technological approaches in agriculture. The discipline aims to develop knowledge for obtaining stable yields and producing environmentally safe agricultural products to protect human health, as well as to study the main physicochemical and ecological properties of soils and their conservation.	BD
22	Ecological Aspects of Natural Science	Within the discipline, the formation of a responsible attitude toward the natural environment is studied based on the recognition of its universal value. The course examines the natural limits of modern socio-economic development and the causes of the environmental crisis. It aims to develop knowledge of the consequences of human activities from the perspective of ecological compatibility, minimizing or preventing harm to the environment. The discipline also fosters the ability to perceive environmental threats, develop ecological sensitivity, and promote readiness to protect and conserve nature.	BD
23	Environmental Issues of Zhetysu Region	Within the discipline, general information about the Zhetysu region is studied, including the characteristics of its relief, climate, landscapes, and natural regional complexes. The course examines data on land, water, and forest resources, mineral wealth, flora and fauna, as well as specially protected natural areas. Special attention is given to environmental requirements and pollution issues in the Almaty region, including water, soil, and atmospheric environmental problems of the area.	BD
24	Development of Environmental Regulations of Enterprises	Within the discipline, types of environmental activities are studied, along with the principles and rules of environmental protection. The course examines regulatory and technical documentation in the field of environmental protection, including environmental quality standards. Special attention is given to environmental impact assessment (EIA) as a tool for environmental analysis and decision-making.	BD
25	Waste Disposal, Decontamination and Disposal	Within the discipline, the main groups of pollutants and their migration, transformation, and accumulation pathways in ecosystems are studied. The course examines the mechanisms of environmental factor impacts on living organisms, their limits of tolerance, and adaptive responses to stress conditions. The discipline develops knowledge about the effects of various types of pollutants on individual organisms, the physiological foundations of human health, environmental risk factors, and the potential for ecological adaptation.	BD

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26	Teaching on the Environmen	interaction of living organisms with the environment are studied, covering the period from the origin of life on Earth to the present day. The course examines the concept of the environment, the dynamics of its changes, and their impact on the biosphere. It also provides a systematic understanding of the key concepts, terminology, and research methods used in environmental science.		BD
27	Methods and Means of Monitoring Environmental Measurements	Within the discipline, methods and instruments for measurement control used in environmental monitoring are studied. The course examines the principles of ecosystem standardization and methodologies for assessing environmental impacts caused by human activities. Special attention is given to modern environmental monitoring and sampling techniques, including filtration, sedimentation, electrostatic sampling, the use of impingers, absorption, condensation, and methods for collecting individual and composite samples for environmental assessment and research.		BD
28	Mutagenesis and Environment	Within the discipline, the molecular mechanisms of action of genotoxic factors on genetic material are studied, along with the processes of repair of genetic damage and methods for protecting and preserving the gene pool of populations. The course examines approaches to assessing the genotoxicity of substances, as well as the analysis of the magnitude and dynamics of the genetic load in populations in order to predict the consequences of genotoxic impacts on living organisms. The discipline develops modern understanding of the effects of environmental factors on the genetic apparatus of living organisms.		BD
29	Industrial Ecology	Within the discipline, the criteria for evaluating production efficiency are studied, along with the general patterns of production processes and technological systems. The course examines major industrial methods for treating exhaust gases and wastewater, as well as technologies for processing and reusing industrial and consumer waste. The discipline develops knowledge of the theoretical foundations of industrial ecology as a system of technological, economic, biological, and social relationships between humans, economic activities, and the environment. Special attention is given to developing skills in designing measures for the protection of air, water, and land resources.		BD
30	Radiation Ecology	Within the discipline, the fundamentals of radioecology, its goals and objectives, as well as natural and anthropogenic sources of radioactive exposure are studied. The course examines radioactive contamination arising from the nuclear fuel cycle, accidents at nuclear facilities, and the use of nuclear weapons, as well as its impact on the biosphere. Special attention is given to the current state and challenges of environmental safety in the Republic of Kazakhstan.		BD
31	Bases of System Ecology	Within the discipline, the fundamentals of systems ecology are examined as an innovative approach to ecosystem research based on models adopted from engineering sciences, including mathematical calculations and computer modeling. The methodology studied is aimed at identifying potential problems in ecosystems, describing their functioning, and predicting possible future developments.		BD
32	Static Analysis in Ecology	Within the discipline, the features of modeling as a tool for identifying and resolving socio-geoecological contradictions are studied. The course examines the fundamentals of mathematical modeling of ecological processes, as well as the object and subject of research as systems composed of interrelated and interacting natural components. Special attention is given to constructing models of complex natural socio-economic systems using mathematical relationships while taking into account their specific properties.		BD
33	Environmental Biotechnologies	Within the discipline, the main research areas in environmental protection are studied, including the processing of primary and secondary resources, the reclamation of disturbed lands, and the treatment of natural and industrial wastewater to remove pollutants and restore the natural properties of environmental resources. The course examines the development and application of biological systems for addressing and mitigating environmental pollution problems. The discipline provides knowledge in technologies and genetic engineering for the processing of organic and inorganic materials aimed at improving environmental quality and promoting sustainable development.		BD



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34	Methods of Environmental Design	economic activity projects is studied, including environmental justification, environmental assessment, and modern state project expertise within the system of state-legal regulation of environmental quality and rational natural resource management. The course examines the theoretical and legal foundations of environmental expertise, as well as its socio-environmental prerequisites and development trends. The discipline develops knowledge of the stages and specific features of environmental support of project activities in accordance with regulatory, legal, and methodological documentation requirements.	BD
35	Environmental Standardization and Certification	Within the discipline, regulatory and technical documents establishing mandatory requirements, standards, and rules in the field of environmental protection and natural resource management are studied. The course examines issues related to improving environmental safety, protecting the life and health of humans, animals, and plants, and ensuring the safety of facilities with consideration of risks associated with natural and technological emergencies. The discipline develops skills in assessing and verifying environmentally significant product quality indicators, enhances competencies in environmental certification and product safety control, and provides an understanding of mechanisms for protecting consumers from unfair manufacturing practices while ensuring the safety of products for the environment, public health, and property.	BD
36	Ecological Tourism	Within the discipline, the principles of organizing tourism based on respect for the environment, conservation of natural and cultural resources, and promotion of sustainable territorial development are studied. Students are introduced to the fundamentals of ecotourism, its types, international standards and practices, the specifics of planning ecological routes, and the principles of minimizing environmental impact. The socio-economic significance of ecotourism for local communities is also examined.	BD
37	Ecological Urbanization	Within the discipline, the goals and methods of ecology are considered, along with the main approaches to studying adverse environmental phenomena. The course examines natural and technological disasters, their characteristics and impacts, as well as the patterns of their occurrence under the influence of natural and anthropogenic factors.	BD
38	Reclamation of Disturbed Lands	Within the discipline, the problems of modern agriculture and the main approaches to their solution are considered. The course studies biological and agro-physical factors of soil fertility and methods of their regulation using primarily biological approaches. It also examines the most common weed species in northern Kazakhstan, as well as the features of adaptive landscape farming systems on eroded and sodic soils.	PD
39	Geoecology	Within the discipline, the ecological properties of landscapes and larger taxonomic units of physical-geographical regionalization, such as districts, provinces, regions, countries, and other territorial entities, are studied. The course examines the conditions of human habitation and economic activity within specific geosystems.	PD
40	Practical Applications of Skills in the Preparation of an EIA	Within the discipline, the procedure for preparing project documentation regulating the construction, development, reconstruction, conservation, and decommissioning of large-scale and/or environmentally hazardous facilities and structures is studied, with mandatory consideration of environmental impact assessment (EIA). The course examines the requirements for conducting state environmental expertise and the procedure for coordinating project documentation as a unified package.	PD
41	Impact of Industrial Facilities on Environmental Components and Emission Damage Assessment Calculations	Determination of the category of an object that has a negative impact on the environment, description of objects (maps), classification of collected and or buried waste, calculation of emission damage	PD



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42	Environmental Assessment	environmental management and auditing, as well as the fundamentals of environmental mapping are studied. The course examines methods for processing, analyzing, and synthesizing field and laboratory environmental data, with the application of theoretical knowledge in practice. The structure of the current system of industrial environmental control and management is also considered. The discipline develops basic environmental understanding of the theoretical foundations of environmental assessment and methods of environmental research in solving standard professional tasks.	PD
43	Fundamentals of Environmental Monitoring	Within the discipline, the fundamental principles of environmental monitoring and control are studied, including the nature, characteristics, and functions of environmental monitoring. The course examines the organization of monitoring systems at different hierarchical levels, methods and tools for collecting geoecological data, and the specific features of biological monitoring. Special attention is given to the methodology of collecting and analyzing environmental information for the comprehensive assessment of geosystems.	PD
44	Bases of Ecological Rationing and Examination	Within the discipline, types of environmental activities are examined based on a system of norms and rules in the areas of design, environmental protection, rational use of natural resources, and environmental safety, as established in regulatory and legal documentation. The course develops knowledge of regulatory and technical documentation governing the creation of new technologies, engineering solutions, and drafts of regulatory and administrative acts, as well as current environmental legislation.	PD
45	Environmental Code of the Republic of Kazakhstan and Its Enforcement	Public relations arising in the field of use of natural resources, as well as in the field of their conservation, restoration and reproduction, depending on the magnitude of their use, shall be determined by the Land, Water, Forest legislation of the Republic of Kazakhstan, the legislation of the Republic of Kazakhstan On Subsoil and subsoil use, in the field of protection, reproduction and use of wildlife and other legislation of the Republic of Kazakhstan in the field of protection and use of natural resources, respectively	PD
46	Equipment and Technology of Wastewater Treatment	Within the discipline, methods for assessing wastewater pollution and selecting appropriate treatment schemes are considered. The course studies the fundamentals of rational use and protection of water resources. Special attention is given to technologies for treating natural and wastewater, including mechanical, chemical, physicochemical, and biological methods.	PD
47	Equipment and Technology of Atmosphere Protection	Within the discipline, the basic principles of nature and atmospheric protection, as well as applicable environmental laws, are considered. The course studies permissible loads on natural systems of society, as well as the main patterns and theories of biosphere stability. The discipline develops knowledge of the state of the atmosphere, practical measures for its protection, and the impact of environmental conditions on human health. Special attention is given to developing skills in protecting the atmosphere from pollutants generated by anthropogenic activities.	PD
48	Equipment and Technology for Cleaning Industrial Emissions	Within the discipline, issues of environmental purification from industrial emissions and atmospheric air pollution are considered. The course studies modern methods and technologies for air purification, as well as their practical application. The discipline develops knowledge of the characteristics of emissions from various sources and technologies for removing them from the air. Special attention is given to developing skills in handling hazardous waste and solving tasks aimed at reducing environmental risks in the field of industrial ecology.	PD
49	Greenhouse Gases Regulation and Methods of Their Calculation	Within the discipline, the rules for implementing project mechanisms in the regulation of greenhouse gas emissions and removals, as well as the procedures for their practical application, are considered. The course studies approaches to organizing and implementing project mechanisms aimed at reducing emissions and increasing greenhouse gas absorption.	PD

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50	Rational use of Water	treating wastewater from dissolved and suspended pollutants are considered. The course studies approaches to assessing wastewater pollution levels and selecting appropriate treatment schemes. The discipline develops knowledge required for the rational use and protection of water resources and includes the study of natural and wastewater treatment technologies, such as mechanical, chemical, physicochemical, and biological methods.	PD
51	Ecological Modeling and Design of Production	Within the discipline, the concept of a mathematical model of biological population dynamics is introduced, along with the main types of models and principles of their construction. The course studies methods for analyzing mathematical models used to describe and investigate population dynamic processes.	PD