"Kazakh University of Technology and Business" named after K.Kulazhanova" JSC

EDUCATIONAL PROGRAM

6B11230 Life safety and environmental protection

Level: Bachelor

Approved
by the Board of Directors of JSC «K.Kulazhanov KazUTB» "17" 02 2026, protocol No. 4

Recommended
by the Academic Council of JSC «K.Kulazhanov KazUTB» "17" 02 2026, protocol No. 7

Astana – 2026

©Is the intellectual property of JSC "KazUTB named after K.Kulazhanov"
Reprinting and/or further transfer to third parties is prohibited

CONTENT

Preface	3
Approval sheet	4
1 Passport of the educational program	5
2 Qualification characteristics of a graduate of an educational program	5
3 Requirements for the content of the educational program	7
4 Additional educational programs (minor)	8
5 Competency map of the educational program	8
6 Learning outcomes of the educational program and modules	10
7 The relationship between the attainability of the formed learning outcomes according to the educational program and academic disciplines	16
8 Alignment of planned learning outcomes with assessment technologies and teaching methods within the module	36
9 Correlation of learning outcomes of the educational program with the labor functions of professional standards	38
10 Graduate model	43
11 Typical curriculum (appendix to the OP)	44
12 Expert opinion	45

Preface

The educational program "6B11230 Life safety and environmental protection" was developed in accordance with the State Compulsory Standard of Higher Education / Postgraduate Education, approved by the order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 No. 2, as well as on the basis of professional standards: Professional standard: Occupational health and safety 25.12.2024; Hydrometeorology and ecology 13.03.2025; Emergency rescue activities for hazardous production facilities 20.11.2025 the sectoral Atlas and the regional Atlas of occupations and competencies: "Personal Protective Equipment Developer for Harsh Working Conditions," "Environmental Analyst in the Extractive Industries," and "Industrial Safety Engineer" of the Republic of Kazakhstan.

The educational program "6B11230 Life safety and environmental protection " was approved at the meeting of the Council on Academic Quality on "22" 01 2026, protocol No. 3
Chairman E.B. Askarbekov

The educational program "6B11230 Life safety and environmental protection " was approved at the meeting of the Commission on Academic Quality of the Faculty on "21" 12 2025, protocol No. 3/1
Chairman B.A. Serimbetov

The educational program "6B11230 Life safety and environmental protection" was developed and discussed at the meeting of the department "Chemistry, chemical technology and ecology" dated "22" 11 2025, protocol No. 4
Head of the department Zh.T. Nurtai

Approval sheet

Educational program 6B11230 Life safety and environmental protection

AGREED:

Vice-Rector for Administrative Affairs		E.Askarbekov	"22" 01 2026year
Head of Educational Programs Department		B.Bayadilova	"22" 01 2026year
Director «KazGeoMap»		A.Rakhmetolla	"27" 11 2025year
Director «Astana Gas Service» LLP		K.Bagramova	"27" 11 2025year
Director Scientific and Production Association «Energy-saving Technologies» LLP		E.Zhatkanbayev	"27" 11 2025year
Director «Institute of chemistry, Coal and Technology» LLP		B.Ermagambet	"27" 11 2025year
Director of «Petrum»LLP		R.Romazanov	"27" 11 2025year
Student *LSaEP-221*		L.Jumaken	"27" 11 2025year

1 Passport of the educational program

International Standard Classification of Education (ISCED) level	6
National Qualification Framework (NQF) level	6
Sectoral Qualifications Framework (SQF) level	6
Code and name of the field of education	6B11 Services
Direction of training	6B112 Hygiene and labor protection at work
Number and name of the group of educational programs	B094 Sanitary preventive measures
Code and name of the educational program (EP)	6B11230 Life safety and environmental protection
Educational program profile	Higher engineering education
Purpose of the educational program	Preparing competitive graduates in the labor market, providing conditions for obtaining a full-fledged high-quality professional education, professional competence in the field of industrial safety, environmental protection and protection in emergency situations.
Completion criterion of an educational program	At least 240 academic credits
Language of instruction of the educational program	Russian, Kazakh
Distinctive features of the educational program	-
Partner University	-

2 Qualification characteristics of a graduate of an educational program

Degree awarded	Bachelor's Degree in services in the educational program "6B11230 Life safety and environmental protection "
Field of professional activity	Graduates of this educational program carry out activities in the field of life safety and labor protection, including industry, transport, agriculture and utilities, production and consumption, government agencies, and environmental services. Bachelors in this field have all the necessary knowledge and practical skills for qualified work and can hold positions of employees in the departments of labor and emergency situations, as well as specialists from the Ministries of Emergency Situations, Environmental Protection, and labor protection at all industrial enterprises, including in the energy and telecommunications industries.
Types of professional activities	Production and technological activities: - participation in carrying out activities to ensure the safety of life and the protection of the environment, the prevention and elimination of natural and man-made emergencies; - development, implementation and operation of technological systems, networks and equipment designed to ensure the safety of life, environmental protection, protection in emergency situations; - assessment of technical, ecological and economic efficiency in the

	implementation of measures to ensure the safety of life and environmental protection; - assessment of hazardous and harmful factors of production; - prevention of emergency situations in enterprises; - formation and organization of the activities of specialized monitoring, emergency rescue, labor and security services, their material and technical base. Project activities: - development of regulatory, technical and environmental documentation related to the safety of life and environmental protection; - development of technical and working documentation and projects for research of socio-ecological systems and problems related to environmental protection, rational use of natural resources and safety of life. Organizational and managerial activities: - setting goals and formulating tasks for current work and for the future; - maintenance of technical and environmental documentation related to professional activities; - development of norms and rules in the field of life safety, as well as establishing the procedure for their implementation during economic and other activities. Experimental and research activities: - carrying out measurements and surveys of the actual condition of the work area, the environment, natural resources, their quality management and forecasting for the current and long-term periods and analyzing the results; - participation in the development and implementation of methods and programs in the field of life safety, environmental protection, and emergency prevention.
Object of professional activity	- enterprises and organizations that influence natural, man-made, social, information systems and their components; - water, land, biotic and other resources, as well as the health of workers; - factors determining the safety of life, environmental protection, involved in the development, implementation and operation of technological systems, networks and protection in emergency situations; - to prevent industrial, fire, environmental, chemical, radiation and other hazards.
Functions of professional activity	- ensuring the effectiveness of the Occupational Health and Safety Management System at the enterprise; - operational monitoring of working conditions. Conducting production control; - formation and management of communication of summary data for the analysis of production control results; - management and supervision of emergency rescue, search and rescue and other urgent work at hazardous production facilities using special equipment; - guidance and supervision in the preparation of emergency rescue operations; - production of environmental monitoring; - control over regulatory support and compliance in the organization's divisions with legislative and other regulatory legal acts on occupational safety and health of the Republic of Kazakhstan;

	- participation in the organization and conduct of training and advanced training of employees in the field of occupational safety and health; - organization, preparation and implementation of measures aimed at controlling and reducing occupational risks; - ensuring internal control over the state of occupational safety and health at workplaces; - ensuring the effective functioning of the organization's occupational safety and health management system; - participation in the investigation and accounting of industrial accidents and occupational diseases; - ensuring the investigation and accounting of industrial accidents and occupational diseases; - control over regulatory support and compliance in the organization's divisions with legislative and other regulatory legal acts on occupational safety and health of the Republic of Kazakhstan (8-12 labor functions (occupational safety and health engineer category II); - organization and conduct of training and advanced training of employees in the field of occupational safety and health; - organization, preparation and implementation of measures aimed at controlling and reducing occupational risks; - ensuring internal control over the state of occupational safety and health at workplaces; - ensuring the effective functioning of the organization's occupational safety and health management system; - participation in the organization of control over regulatory support and compliance in the organization's divisions with legislative and other regulatory legal acts on occupational safety and health of the Republic of Kazakhstan; - participation in the organization and conduct of training and advanced training of employees in the field of occupational safety and health; - participation in ensuring internal control over the state of occupational safety and health at workplaces.

3 Requirements for the content of the educational program

Name of cycles and disciplines	Workload in academic credits
The cycle of general education disciplines (GED)	**56**
Required component	51
University component	5
The cycle of basic disciplines (BD)	**96**
University component	40
Component of choice	49
Professional practice	7
Cycle of major disciplines (MD)	**80**
University component	5
Component of choice	65
Professional practice	10
Final certification	**8**
Total	**240**

4 Additional educational programs (minor)

4.1 Minor "Modern aspects of artificial intelligence application"

Name of disciplines	Workload in academic credits
Introduction to Artificial Intelligence	5
Development of artificial neural networks	5
Artificial intelligence in object management	5
Total:	15

5 Competency map of the educational program «6B11230 Life safety and environmental protection »

Type of competence	Learning Outcomes Code	Learning outcome (according to Bloom's taxonomy)
Behavioral skills and personality traits (Softskills)	GEK1	Forms a system of general competencies that ensure the socio-cultural development of the future specialist's personality, based on the formation of their worldview, civic, and moral stance, oriented towards a healthy lifestyle.
	GEK3	Promotes the development of information literacy through the mastery and use of modern information and communication technologies in all areas of activity.
	LO1	Develops competencies in the field of economics, law, the foundations of an anti-corruption culture, as well as entrepreneurship and financial literacy skills in professional activities, taking into account the principles of sustainable development, ecology and life safety.
Digital competencies (Digital skills)	GEK2	Capable of communication in both oral and written forms in Kazakh, Russian, and foreign languages to solve tasks related to interpersonal, intercultural, and professional communication.
Professional skills (Hardskills)	LO2	Applies in practice modern methods of physico-chemical, economic analysis, experimental research to solve applied engineering and environmental problems using artificial intelligence.
	LO3	Analyzes working conditions and occupational risks at production facilities using methods of toxicology, hygiene, and equipment reliability assessment in accordance with regulatory documentation, ensuring safe working conditions for employees based on the selection of personal protective, diagnostic, and preventive measures.
	LO4	Designs engineering and organizational solutions for a safe and hygienic production environment, including ventilation, communications, electrical safety, construction materials, and work organization.
	LO5	Evaluates the radiation, chemical and engineering condition of the work area, studying the basic requirements of regulatory documents in the field of fire and industrial safety and the basics of scientific research in the field of safety.

	LO6	Analyzes the state of the environment and sources of pollution using monitoring methods, impact assessment, environmental expertise, waste control, and the evaluation of air, water, and soil quality, in accordance with environmental regulatory requirements.
	LO7	Organizes work on waste management, treatment of emissions and wastewater, land protection, and ensuring the safety of production processes using engineering protection, computer-aided design (CAD) systems, and intelligent technologies, as well as the development of measures to reduce the harmful impact on the environment.
	LO8	Defines solutions to educational, practical and professional tasks in the ability to act competently in case of accidents, catastrophes and emergency situations, as well as for guidance and supervision in the preparation of rescue operations.
	LO9	Develops engineering and design solutions for environmental protection and life safety, including air and wastewater purification, waste management, design of treatment devices, and the use of AI technologies to ensure environmental safety.
	LO10	Formulates conclusions and proposals for improving an enterprise, organization, industry or country as a whole.

6 Learning outcomes of the educational program and modules

Key competencies	Learning Outcomes (LO) for the educational program	Name of module	Learning outcomes for the module	Name of disciplines that form learning outcomes
Behavioral skills and personality traits (Softskills)	GEK1 Forms a system of general competencies that ensure the socio-cultural development of the future specialist's personality, based on the formation of their worldview, civic, and moral stance, oriented towards a healthy lifestyle.	Man and Society – the foundation of worldview and socio-political knowledge.	Applies the fundamental laws of Kazakhstan's history, philosophy, and socio-political knowledge for effective socialization and adaptation in changing socio-cultural conditions, shaping a personality capable of mobility in the modern world, critical thinking, and physical self-improvement.	History of Kazakhstan
				Philosophy
				Physical Culture
				Module of socio-political knowledge (political science, sociology, cultural studies, psychology)
	GEK3 Promotes the development of information literacy through the mastery and use of modern information and communication technologies in all areas of activity.		Possesses various types of information and communication technologies for searching, storing, processing, protecting, and disseminating information.	Foreign language
				Kazakh (Russian) language
	LO1 Develops competencies in economics, law, the fundamentals of anti-corruption culture, as well as entrepreneurship and financial literacy skills in professional activities, taking into account the principles of sustainable development, environmental protection, and life safety.		Possess the basics of economics, law, and finance, and is able to apply them to business activities, legal protection, and personal finance management. Possesses basic knowledge in the field of information and communication technology	Module of economics, entrepreneurship, law and financial literacy (fundamentals of economics and entrepreneurship, basics of law and anti-corruption culture, basics of financial literacy)

Digital competencies (Digital skills)	GEK2 Capable of communication in both oral and written forms in Kazakh, Russian, and foreign languages to solve tasks related to interpersonal, intercultural, and professional communication	Information and Communication Module	Capable of interpersonal social and professional communication in Kazakh, Russian, and foreign languages.	Information and communication technologies
Professional skills (Hardskills)	LO2 Applies in practice modern methods of physico-chemical, economic analysis, experimental research to solve applied engineering and environmental problems using artificial intelligence.	Technical and economic sciences	Masters fundamental natural science and engineering knowledge, is able to apply them to solve professional problems, analyze technical processes, introduce sustainable development technologies, and ensure environmental and industrial safety.	Physics
				Engineering Graphics Descriptive geometry
				General chemistry
				Theory of combustion and explosion
				Standardization, certification and metrology Introduction to Artificial Intelligence
				Sustainable development, ecology and life safety
	LO3 Analyzes working conditions and occupational risks	Organization of safety at production	Forms professional competencies in the field of occupational safety, industrial safety, ergonomics and engineering, is able to identify and assess risks,	Industrial ventilation Materials Science and Technology of Structural

	at production facilities using methods of toxicological assessment, hygienic rationing, ergonomic analysis and special assessment of working conditions, in accordance with the requirements of labor legislation and regulatory documentation. LO4 Designs engineering and technical solutions that ensure a safe working environment, including ventilation systems, electrical safety, engineering communications and protection from hazardous factors, taking into account the reliability of technical systems, requirements and standards of occupational safety.	facilities	develop measures to reduce them, ensure safe working conditions and the operation of technical systems in accordance with the requirements of industrial and sanitary safety.	Materials Occupational safety risk management Reliability of technical systems and production risks Basics of toxicology Industrial sanitation and occupational health Hygiene and sanitation of the workplace Occupational safety and health Ergonomics and workplace organization Physiology and psychology of work Security of engineering communications Engineering systems, networks and equipment Electrical safety of industrial enterprises Safety of work in the electric and heat power industry Production practice 1
Professional skills (Hardskills)	LO6 Provides knowledge on the development of regulatory, technical and environmental documentation related to environmental protection LO7 He plans to organize and	Engineering environmental protection	Masters knowledge and skills in the field of environmental protection and sustainable use of natural resources, is able to assess environmental risks and develop technical solutions to minimize the impact of production activities on nature.	Environmental monitoring Production and consumption waste management Solid waste management Processes and devices for protection of atmospheric

	coordinate work on the implementation of systematic observations of the state of the environment (atmospheric air, precipitation, surface water, soil), environmental expertise. LO9 Develops measures to ensure the safety of life, environmental protection, protection in emergency situations using international standards and standards of the Republic of Kazakhstan			air Protection of the air basin from pollution
				Environmental expertise Environmental Impact Assessment
				Engineering environmental protection Safety of production processes
				Wastewater treatment equipment and technology Natural and waste water treatment Protection and rational use of land resources Soil science and protection of land resources
				Development of artificial neural networks
				Fundamentals of the APS Basics of design of sewage treatment plants
				Production practice II
Professional skills (Hardskills)	LO5 Evaluates the radiation, chemical and engineering condition of the work area, studying the basic requirements of regulatory documents in the field of fire and industrial safety and the basics of scientific	Industrial safety and civil defense	Possess knowledge and skills in the field of industrial safety and protection in emergency situations, is able to effectively prevent and manage risks to life, health and the environment.	Fundamentals of industrial safety Technical regulation of industrial safety
				Seismological research Thermodynamics, heat transfer and hydraulics

	research in the field of safety. LO8 Defines solutions to educational, practical and professional tasks in the ability to act competently in case of accidents, catastrophes and emergency situations, as well as for guidance and supervision in the preparation of rescue operations. LO9 Develops measures to ensure the safety of life, environmental protection, protection in emergency situations using international standards and standards of the Republic of Kazakhstan			Fire safety Explosion and fire safety of production Radiation Safety Basics Emergency assistance to victims in emergency situations Technical solutions and methods of protection in emergencies Emergency rescue operations at hazardous production facilities Regulatory aspects of life safety and environmental protection Prevention and elimination of natural and man-made emergencies Industrial ecology Basics of chemical and biological safety Ensuring safe conditions for the chemical industry

				Organization and conduct of civil defense Fundamentals of rescue work in emergency situations Artificial intelligence in the management of object
				Fundamentals of scientific research in the field of industrial safety
				Pre-graduate/industrial practice
	LO10 Formulates conclusions and proposals for improving an enterprise, organization, industry or country as a whole	Final certification	Performs and successfully defends a thesis or passes a comprehensive exam	Occupational safety and health Final certification

7 The relationship between the attainability of the formed learning outcomes according to the educational program and academic disciplines

№	Name of the discipline	Brief description of the discipline	Number of credits	Formed learning outcomes (codes)													
				GEK$_1$	GEK$_2$	GEK$_3$	LO$_1$	LO$_2$	LO$_3$	LO$_4$	LO$_5$	LO$_6$	LO$_7$	LO$_8$	LO$_9$	LO$_{10}$
The cycle of general education disciplines Required component																	
1	History of Kazakhstan	The purpose of the discipline shall be to give objective knowledge about the main stages in the development of the history of Kazakhstan from ancient times to the present. The program consists of 5 thematic blocks: Ancient people and the formation of a nomadic civilization, Turkic civilization and the Great Steppe, Kazakhstan in a new era (XVIII-early XX centuries), Kazakhstan in the Soviet period, and Independent Kazakhstan. Upon completion of the discipline, student applies skills of analytical, axiological, critical analysis in the study of historical processes for an objective understanding of the modern Kazakh model of development.	5	+													
2	Philosophy	The purpose of the program is to develop students' holistic understanding of philosophy as a special form of knowledge of the world, its main branches, problems, and methods of their study in the context of future professional activity. The discipline covers the key directions in the emergence and development of philosophy, the foundations of the philosophical understanding of the world, the philosophy of the human being, and the world of values. Upon completion of the discipline, student	5	+													

		argue their own moral position regarding relevant issues of contemporary global society.															
3	Physical Culture	The goal of the curriculum shall be the formation of socio-personal competences of students and the ability to purposefully use the means and methods of physical culture for conservation, promotion of health to prepare for professional activities; to take physical stress, mental stress and adverse factors in their future activities. Upon completion of the curriculum, the student shall to use a variety of forms and types of physical activities for healthy life, active recreation and leisure.	8	+													
4	Module of socio-political knowledge (political science, sociology, cultural studies, psychology)	The objective of the discipline is to form the socio-humanitarian worldview of learners in the context of addressing the tasks of modernizing public consciousness, encompassing the interdisciplinary study of sociology, political science, cultural studies, and psychology while integrating principles of inclusion and the «Adal Azamat» (Honest Citizen) value orientations as fundamental pillars for the development of modern society. Upon completion of the discipline, the student interprets socio-humanitarian knowledge and ethical values based on scientific methods of social analysis, participates in conflict resolution, and provides reasoned advocacy for positions regarding the modernization of Kazakhstan.	8	+													
5	Foreign language	The goal of the curriculum shall be the formation of intercultural communicative competence of students in the process of foreign language education at a sufficient level (A2, common European framework) and the level of basic sufficiency (B1, common European framework). The course content entails a sequential study of	10			+											

		language proficiency levels by integrating social, socio-cultural, and academic-professional communication spheres. Upon completion of the discipline, student will be able to articulate potential solutions to contemporary issues in a foreign language, utilizing evidence-based information and reasoned arguments.															
6	Kazakh (Russian) language	The purpose of the program - to teach the Kazakh (Russian) language in accordance with international standards for teaching languages, to increase the importance of the Kazakh language as the state language and the Russian language as a medium for intercultural and professional communication, developing competence in the use of the Kazakh (Russian) language by a future specialist as a means of communication in scientific, socio-cultural, political, professional spheres of public life. Upon completion of the curriculum, the student shall show competence in conditions of personal, social and professional communication in accordance with the peculiarities of the language, culture, communication situation.	10			+											
7	Information and communication technologies	The purpose of the program is to develop the ability to critically evaluate and analyze processes, methods of searching, storing and processing information, and methods of collecting and transmitting information through digital technologies. Studies the fundamentals of working with information, digital technologies, and computer systems; the application of software, internet services, and ICT in professional and research activities; information security; and artificial intelligence technologies. Upon completion of the discipline, student will be able to	5		+												

		utilize digital technologies to develop data analysis and management tools for various fields of activity.																
The cycle of general education disciplines The university component																		
8	Module of economics, entrepreneurship, law and financial literacy (fundamentals of economics and entrepreneurship, basics of law and anti-corruption culture, basics of financial literacy)	The discipline is aimed at developing entrepreneurial thinking, financial responsibility, legal literacy, fostering an anti-corruption culture, and commitment to the principles of law and order in a market economy. Its content includes the fundamentals of economics, entrepreneurship, financial literacy, law, anti-corruption culture. As a result of studying the discipline, the student has the skills to make effective economic decisions, ensure legal protection, apply financial literacy, and adhere to anti-corruption practices.	5				+										
The cycle of general education disciplines The university component																		
9	Environmental monitoring	The purpose of the discipline is to form knowledge about the concepts, principles of organization and functioning of modern monitoring systems that affect all complex relationships and all components of the environment. The discipline studies theoretical and practical issues of monitoring the state of the natural environment and warning about emerging critical situations harmful or dangerous to human health, flora and fauna.	5										+	+		+	
10	General chemistry	The purpose of the discipline is to form systematic knowledge about the properties, structure and chemical behavior of compounds, about the	6					+									

		quantum mechanical structure of atoms and molecules, about the nature of chemical bonds in compounds, as well as modern ideas about the nature of chemical bonds. The discipline covers the theoretical foundations of chemistry and how they can be used to solve specific chemical and materials science problems.														
11	Fundamentals of scientific research in the field of industrial safety	Builds students' knowledge in conducting scientific research in the field of safety at enterprises. Students study methods of hazard analysis and assessment, as well as develop recommendations for reducing threats at production facilities.	3								+			+	+	
12	Radiation Safety Basics	Formation of knowledge on radiation safety, ensuring safe operation with ionizing radiation sources, their dosimetry and control. The discipline studies the basics of radiation safety, radioactivity, mechanisms of interaction of ionizing radiation with biological objects and methods of measuring ionizing radiation, methods of protection against ionizing radiation, methods of radiometric control, legal aspects of radiation safety.	5								+			+	+	
13	Industrial Toxicology	The discipline develops knowledge about the sources of formation of toxic compounds, the transformation of toxicants, and the effects of toxic substances at various levels of organization of living matter. The content covers the concepts of toxicology and toxicometry, the characteristics and specific effects of major ecotoxicants, radioactive radiation, and radionuclides on living organisms, as well as the mechanisms of toxic action. As a result of studying the discipline, the student analyzes the impact of toxic substances on the human body and environmental components.	5						+	+						
14	Theory of	The aim of the discipline is to study the conditions	5				+									

	combustion and explosion	of formation of shock waves and detonation phenomena, as well as their sources. Knowledge of these issues allows for a qualitative and quantitative assessment of combustion and explosion processes. Formation of knowledge in students about the physical and chemical processes of combustion and explosion, material and heat balances, development of combustion processes and conditions for their occurrence															
15	Sustainable development, ecology and life safety	This discipline is designed to cultivate a systemic understanding of the principles of balancing economic development, social well-being, environmental preservation, and the protection of human life and health. It covers key issues in ecology, environmental protection, life safety, and sustainable development. Upon completion of the course, students will be able to apply the principles of sustainable development, environmental safety, and occupational health and safety to manage energy and waste within a circular economy framework.	5				+										
16	Physics	The discipline studies fundamental physical laws and their application in technology. The sections of physics such as mechanics, molecular physics, thermodynamics, electromagnetism and optics are considered. Measurement methods in experimental studies are being studied. As a result, students gain an understanding of physical processes and their application in the development and analysis of technical systems and devices.	4					+									
17	Introduction to the Specialty	The aim of the course is to develop foundational knowledge about professional activities in the field of life safety and environmental protection, including understanding the role and							+								

		responsibilities of a specialist in this area. The course covers the basic concepts and categories of safety, sources of hazards in the technosphere and natural environment, requirements of the regulatory and legal framework, and also provides knowledge about directions of professional activity and principles for ensuring the safety of humans and the environment at various levels.																
The cycle of basic disciplines Component of choice																		
18	Emergency rescue operations at hazardous production facilities	The purpose of the discipline is to form knowledge about the use of special search devices, take measures to save them, provide them with first aid and other types of assistance. This discipline studies emergency rescue, search and rescue and other urgent work at hazardous production facilities using special equipment and equipment, as well as the search for victims.	5												+			
19	Safety of work in the electric and heat power industry	he purpose of the discipline is to master knowledge about the basic requirements for protective equipment used when working in existing electrical installations. The discipline examines the effects of electric current on the human body, the effects of electromagnetic radiation on biological objects, requirements for personnel allowed to work in existing electrical installations, the procedure and conditions for work in existing electrical installations. T	5								+							
20	Explosion and fire safety of production	The purpose of the discipline is theoretical and practical training on fire and explosion safety, the formation of fundamental knowledge about the theory of gorenje and explosion and the dangers of these processes. The discipline contains knowledge about the student's preparation for the use in	5									+						

		professional activities of the acquired body of knowledge, skills and abilities to ensure fire and explosion safety in the field of industrial activity.																
21	Engineering Graphics	The purpose of the discipline is to study and master the rules for the implementation, designation, drawing, which make it possible to depict parts and assemblies of technological machines using views, sections, sections, assembly drawings at the request of the unified system for design documentation. The study of the discipline allows you to develop the spatial and logical thinking of a specialist necessary for the development of drawings when creating new technological equipment.	4					+										
22	Materials Science and Technology of Structural Materials	The purpose of the discipline is to form students"" knowledge about technological methods of obtaining and processing blanks. This discipline reveals the essence of various technological methods (metallurgical, foundry, welding, metalworking and cutting), their technological capabilities, as well as processing schemes, information about the appropriate equipment and tools.	5							+								
23	Reliability of technical systems and production risks	The purpose of the discipline is to train young specialists who know the theoretical and practical basics of labor protection. Formation of a complex of knowledge, skills and abilities necessary for identification (identification) of hazards of industrial activity that can have a negative impact on the body of the worker, assessment of the associated occupational risks, determination of measures to manage such risks.	5						+	+								
24	Descriptive geometry	The purpose of the discipline is to study the basic provisions of the rectangular projection method, on	4					+										

		which the theoretical foundations and rules for constructing images of spatial objects on a plane, their properties and features, and mastering the rules when drawing up a technical drawing at the request of the unified system for design documentation are based. The study of the discipline allows you to develop the ability to analyze and synthesize spatial forms and their relationships based on graphic models of space.															
25	Regulatory aspects of life safety and environmental protection	The purpose of the discipline is to form knowledge about regulatory legal acts in the field of labor protection, industrial safety, and environmental protection. The discipline studies the main provisions of the Constitution of the Republic of Kazakhstan, the Labor Code, the Environmental Code, the Law on Civil Protection, legislative and regulatory acts in the field of industrial safety, labor protection and environmental protection, emergency situations.	5								+						
26	Fire safety	The purpose of the discipline is to study the main directions for ensuring fire safety in buildings and premises with a mass stay of people. The discipline considers the rules on fire safety, the technical regulations "General requirements for fire safety", as well as the development of evacuation and emergency response plans, training alarm programs and emergency training.	5								+			+	+		
27	Industrial ventilation	The purpose of the discipline is to form a system of knowledge among students on the basics of theory and practice of industrial ventilation design. The discipline studies the scientific foundations, technical means and practical ways to create and maintain normal atmospheric conditions and the required degree of air cleanliness in workplaces and	5						+	+							

		in the human habitat in production conditions.																
28	Seismological research	The purpose of the discipline is to form students' knowledge and skills on the internal structure of the Earth and methods of seismology. The discipline studies the patterns of the distribution of seismicity of the territory of Kazakhstan and the World, the available points of view on the conditions of occurrence of earthquakes, as well as the scientific approach to the seismic zoning of the studied object, the ability to analyze the seismic hazard and the consequences of earthquakes.	5											+		
29	Standardization, certification and metrology	The purpose of studying the discipline is to form knowledge of the basic principles of standardization, certification and metrology necessary for the analysis, application, assessment and confirmation of compliance with the requirements of technical regulations and standards in the field of life safety and environmental protection, as well as the application of skills in using measuring instruments to monitor facilities in the field of life safety and environmental protection.	5					+								
30	Introduction to Artificial Intelligence (Minor 1)	The discipline is aimed at studying the basic concepts, methods and technologies used in modern artificial intelligence systems. The course covers artificial neural networks, machine learning, deep learning, as well as applied algorithms and models used in various fields such as computer vision, natural language processing, robotics, and game art. At the end of the course, students are able to analyze and solve problems using artificial intelligence methods.	5					+								
31	Thermodynamics, heat transfer	The purpose of the discipline is to form students' knowledge about the subject of thermodynamics,	5											+		

	and hydraulics	heat transfer, hydraulics and their relationship to other branches of knowledge. The discipline studies basic concepts and definitions, fundamentals of thermodynamic and thermal processes, hydrostatics and hydrodynamics in order to analyze and solve engineering problems related to energy and heat engineering.															
32	Technical solutions and methods of protection in emergencies	The purpose of the discipline is to form knowledge about the performance of work on accident localization, preparation for the operation of emergency rescue equipment, property and equipment for emergency rescue operations. The discipline contains information in the field of protecting the population and territories from emergency situations, and provides information on predicted and emerging emergencies and their consequences.	5												+		
33	Occupational safety risk management	The purpose of the discipline is to develop knowledge in the field of organization, preparation and conduct of activities aimed at controlling and reducing occupational risks. The discipline considers measures to manage occupational risks in the workplace, including analyzing and developing plans to reduce them using artificial intelligence.	5						+	+							
34	Comprehensive Labor Management System	The discipline develops knowledge of a comprehensive system for organizing labor in production processes, taking into account the requirements of physiology, labor psychology, and ergonomics. The content covers the principles of rational labor organization, workplaces, work and rest regimes, as well as factors influencing safety, work capacity, and labor productivity. As a result of studying the discipline, the student develops measures for the rational organization of	5						+								

		workplaces aimed at reducing occupational risks and improving labor efficiency.															
35	Emergency assistance to victims in emergency situations	The purpose of the discipline is to form knowledge in the field of disaster medicine and psychological resilience, namely the organization of medical and psychological protection of the population and rescuers in emergency situations. The discipline studies a set of organizational and medical measures carried out to prevent or reduce the level of violations among the population and rescuers involved in emergency response.	5								+			+	+	
36	Electrical safety of industrial enterprises	The purpose of the discipline is to study the system of organizational and technical measures and means to protect people from the harmful and dangerous effects of electric current, electric arc, electromechanical current. The issues of creating safe conditions in work areas, on the development and implementation of measures to protect humans and their environment from dangerous influences are considered.	5							+							
37	Ergonomics and workplace organization	The aim of the discipline is to develop knowledge and skills in creating safe, comfortable, and efficient working conditions in accordance with ergonomic requirements. The course studies the principles of workplace design, human anthropometric and psychophysiological characteristics, labor standardization, organization of the work environment, and methods for improving productivity.	5						+	+							
The cycle of profile disciplines The university component																	
38	Occupational safety and health	The purpose of the discipline is to acquire skills by future specialists in monitoring the state of working conditions in the workplace, monitoring the	5						+	+							+

		implementation of preventive and reactive measures, monitoring MPC, MPC of harmful and dangerous production factors. The discipline examines regulatory legal acts in the field of life safety, as well as safety requirements for production equipment and processes.															
The cycle of profile disciplines Component of choice																	
39	Security of engineering communications	The purpose of the discipline is to form students"" knowledge about engineering communications and their safe operation. The discipline examines theoretical knowledge and practical skills in the design, fundamentals of design and operation of engineering systems for heat and gas supply, heating, ventilation, water supply and sewerage, as well as environmental protection systems.	5							+						
40	Development of artificial neural networks (Minor 2)	The discipline focuses on the study of methods for creating and training neural networks, which are mathematical models that mimic the work of the human brain. During the course of studying this discipline, students will learn about various types of neural networks, their structures and learning algorithms. Upon completion of the course, students will be able to create, train and apply neural networks to solve various tasks in the field of artificial intelligence and machine learning.	5												+	
41	Safety of production processes	The purpose of the discipline is to form knowledge about the safety of production equipment, which includes the safety of production processes. The discipline studies the requirements for the safety of production processes, which reflect technical regulations and national standards, and also contains knowledge about the safety of production processes throughout time, technological process,	5									+	+			

		reception, operating mode and maintenance of production equipment.															
42	Hygiene and sanitation of the workplace	Forms knowledge about the identification and assessment of the levels of exposure to harmful production factors, as well as the justification for the need to use technical means and methods of protecting workers to preserve health and efficiency. The discipline studies occupational hazards arising in a particular industrial environment in order to develop and implement preventive measures to ensure safe working conditions.	5						+							
43	Engineering environmental protection	The aim of the course is to develop students' knowledge and skills necessary for designing, developing and implementing engineering solutions aimed at preventing, minimizing and eliminating the impact of industrial and other anthropogenic factors on the natural environment. The course is aimed at mastering methods for assessing environmental risks, developing environmentally friendly technologies and structures, as well as applying the principles of sustainable development and environmental protection in engineering practice.	5												+	
44	Engineering systems, networks and equipment	The discipline aims to provide future specialists with the basics of theoretical knowledge and practical skills in the field of engineering systems. Examines the basic laws of hydraulics and thermodynamics, issues of water supply, heat supply, gas and electricity supply, ventilation and air conditioning of residential, public and industrial buildings.	5						+							
45	Ensuring safe conditions for	The purpose of the discipline is to form knowledge on ensuring safe working conditions in the	5								+					

	the chemical industry	chemical industry. The discipline covers all aspects of safe behavior at the facility, the work process itself, the handling of reagents, substances or technical equipment, and also considers the main measures to ensure safe working conditions in the chemical industry.															
46	Organization and conduct of civil defense	The purpose of the discipline is to form knowledge about measures to ensure fire and industrial safety, the formation, storage and use of the state material reserve. The discipline studies activities carried out in peacetime and wartime aimed at preventing and eliminating emergencies and their consequences, organizing and conducting civil defense, and providing emergency medical and psychological assistance to the population.	5												+		
47	Basics of design of sewage treatment plants	The purpose of the discipline is to study the basics of designing sewage treatment plants, as well as to teach future specialists how to correctly draw up technical specifications for design. The discipline considers the issues of conducting a qualified assessment of the design and technical solutions adopted in the project, as well as the control of installation and commissioning work at wastewater treatment plants.	5									+					
48	Fundamentals of industrial safety	The goal is to theoretically and practically prepare future specialists with fundamental knowledge in the field of industrial safety at hazardous production facilities, allowing them to independently operate hazardous production facilities, as well as analyze the causes of accidents and emergencies, and readiness for emergency response. The discipline studies regulatory legal acts in the field of industrial safety at hazardous production facilities.	5								+						

49	Fundamentals of AI-Based Automated Design Systems	Brief description of the course: The discipline is aimed at developing knowledge of the fundamentals of computer-aided design using artificial intelligence. The content covers the basic principles of CAD, including design automation, modeling and analysis, as well as artificial intelligence technologies to improve design solutions in the field of safety and environmental protection. As a result of studying the discipline, the student develops design solutions using engineering system modeling software with the application of AI.	5										+		+	
50	Fundamentals of rescue work in emergency situations	The aim of the discipline is to develop students' theoretical knowledge and practical skills in organizing and conducting rescue operations during emergencies. The course covers the classification of emergencies, organization of rescue units, rescue tools and methods, safety regulations, and coordination between emergency services.	5											+		
51	Basics of chemical and biological safety	The purpose of the discipline is to form knowledge about the classification of chemical and biological toxins, the mechanism of their effects. The discipline contains an analysis of technological processes in the production or use of harmful chemical or biological substances, natural sources of harmful chemical or biological substances and recommendations, measures, methods and techniques for the neutralization of harmful chemical and biological substances.	5								+					
52	Protection of the air basin from pollution	The purpose of the discipline is to familiarize students with the methods and equipment of air basin protection, the formation of skills and abilities necessary for the calculation and design of	5										+			

		air basin protection systems, as well as the formation of knowledge on the development, implementation and operation of equipment. The discipline outlines the scientific, organizational and legal foundations of environmental protection.															
53	Protection and rational use of land resources	The purpose of the discipline is to form fundamental knowledge about the living shell of the Earth – the soil, as a natural body, its properties, formation, evolution. The discipline contains the study of the soil formation process, its manifestations on the Earth"s surface, the influence of environmental factors on soil formation, the role of soil in nature and human economic activity, in maintaining the stability of the biosphere.	5										+			
54	Environmental Impact Assessment	The purpose of the discipline is the scientific, theoretical and legal foundations of the system of preventive environmental regulation. The discipline studies the assessment of the impact of planned economic and other activities on the environment, the procedure and procedure for environmental impact assessment in the Republic of Kazakhstan in accordance with current legislation, as well as the impact of various types of economic activities.	5										+			
55	Natural and waste water treatment	The purpose of the discipline is to develop students' knowledge and skills in the field of natural and wastewater treatment technology, design of water treatment facilities. The discipline studies the essence of the processes occurring during the operation of individual wastewater treatment plants, a whole complex of facilities, the methodology for calculating and selecting equipment and designing water treatment and precipitation treatment plants.	5										+			
56	Environmental Protection and	The discipline is aimed at developing knowledge about the relationship between environmental	5									+					

	Human Health	conditions and human health. The content covers the study of environmental risk factors, protection methods, monitoring of air, water, and soil pollution, and environmental impact assessment. As a result of studying the discipline, the student develops measures for environmental protection and public health aimed at reducing the negative impact of industrial and natural factors.																
57	Prevention and elimination of natural and man-made emergencies	The purpose is to form knowledge about control and supervision in the field of civil protection, civil protection measures to prevent emergencies, eliminate natural and man-made emergencies and their consequences, emergency rescue and emergency work in emergency situations. The discipline studies basic information about emergency situations of a natural, man-made, social and military nature.	5									+			+			
58	Industrial sanitation and occupational health	The purpose of the discipline is the theoretical and practical training of students on industrial sanitation, including biological, chemical, physical and psychophysiological factors. The discipline considers the classification of harmful substances, defines and normalizes the content of harmful substances in the air of the working area, defines the main diseases arising from exposure to harmful substances, describes the influence of microclimate parameters on human health and performance.	5						+									
59	Industrial ecology	The purpose of the discipline is to study the effects of industrial facilities (from individual apparatuses and enterprises to the technosphere) on nature and the impact of environmental conditions on the functioning of enterprises and their complexes. The discipline considers monitoring, regulation, control, and environmental impact management both at the	5									+				+		

		individual production level and at the territorial level.															
60	Processes and devices for protection of atmospheric air	The purpose of the discipline is to form knowledge in the field of atmospheric air protection through the use of processes and devices that reduce emissions of harmful gases and vapors into the environment. The discipline examines the basics of designing processes and devices (dry, wet, filtration) to protect the atmosphere from harmful gases and vapors	5										+			
61	Wastewater treatment equipment and technology	The purpose of the discipline is to familiarize students with the technology of natural and wastewater treatment and their facilities. To familiarize future engineers with the environmental problems currently facing humans, specific problems of protecting the water basin, ways and promising methods of solving these problems, that is, to provide modern engineering and environmental training.	5									+	+			
62	Technical regulation of industrial safety	The purpose of the discipline is to provide an opportunity for students to acquire and assimilate knowledge in the field of legislation on technical regulation and civil protection of the Republic of Kazakhstan. The discipline studies industrial safety, signs of hazardous production facilities, industrial safety expertise, mandatory declaration of industrial safety of a hazardous production facility, training, retraining of specialists, employees of hazardous production facilities.	5								+				+	
63	Production and consumption waste management	Forms knowledge about the identification and assessment of the levels of exposure to harmful production factors, as well as the justification for the need to use technical means and methods of protecting workers to preserve health and	5									+	+			

		efficiency. The discipline studies occupational hazards arising in a particular industrial environment in order to develop and implement preventive measures to ensure safe working conditions															
64	Artificial intelligence in the management of object	The discipline studies the basic concepts and principles of artificial intelligence systems, as well as their application in object management. Methods and technologies of artificial intelligence for effective management of objects. Upon completion of the course, students gain the skills and knowledge necessary for successful management of facilities using	5												+		
65	Solid waste management	The purpose of the discipline is to form students"" knowledge about solid waste management, as well as about the regulatory framework for solid waste management and the tasks of environmental protection services. The discipline considers the classification of solid waste based on their chemical and physical nature, types and properties that pose a huge threat to the ecological balance of nature, the impact of the role of solid waste storage on the natural environment	5									+	+				
66	Environmental expertise	The purpose of the discipline is to familiarize students with the methods and equipment of air basin protection, the formation of skills and abilities necessary for the calculation and design of air basin protection systems, as well as the formation of knowledge on the development, implementation and operation of equipment. The discipline outlines the scientific, organizational and legal foundations of environmental protection.	5										+				

8 Alignment of planned learning outcomes with assessment technologies and teaching methods within the module

Learning Outcomes (LO) Number	Planned learning outcomes for the module	Assessment technologies (tools)	Methods of learning and teaching
GEK1	Applies the fundamental laws of Kazakhstan's history, philosophy, and socio-political knowledge for effective socialization and adaptation in changing socio-cultural conditions, shaping a personality capable of mobility in the modern world, critical thinking, and physical self-improvement.	Colloquium	Interactive lecture, discussion
GEK2	Capable of interpersonal social and professional communi-cation in Kazakh, Russian, and foreign languages.	Colloquium, project work, case study	Interactive lecture, project defense, case studies
GEK3	Possesses various types of information and communication technologies for searching, storing, processing, protecting, and disseminating information.	Testing, multi-level tasks and assignments	Test assignments, interactive lecture, brainstorming
LO1	Develops competencies in economics, law, the foundations of an anti-corruption culture, as well as entrepreneurship and financial literacy skills in professional activities	Colloquium	Interactive lecture
LO2	Applies in practice modern methods of physico-chemical, economic analysis, experimental research to solve applied engineering and environmental problems using artificial intelligence.	Colloquium, project work, case study	Interactive lecture, project defense, case studies
LO3	Analyzes working conditions and occupational risks at production facilities using methods of toxicological assessment, hygienic rationing, ergonomic analysis and special assessment of	Testing, multi-level tasks and assignments	Test assignments, lecture-discussion, round table method, lecture-discussion

	working conditions, in accordance with the requirements of labor legislation and regulatory documentation.		
LO4	Designs engineering and technical solutions that ensure a safe working environment, including ventilation systems, electrical safety, engineering communications and protection from hazardous factors, taking into account the reliability of technical systems, requirements and standards of occupational safety.	Testing, multi-level tasks and assignments	Test assignments, lecture-discussion, round table method, lecture-discussion
LO5	Evaluates the radiation, chemical and engineering condition of the work area, studying the basic requirements of regulatory documents in the field of fire and industrial safety and the basics of scientific research in the field of safety.	Testing, multi-level tasks and assignments	Test assignments, lecture-discussion, round table method, lecture-discussion
LO6	Provides knowledge on the development of regulatory, technical and environmental documentation related to environmental protection	Testing, multi-level tasks and assignments	Test assignments, lecture-discussion, round table method, lecture-discussion
LO7	He plans to organize and coordinate work on the implementation of systematic observations of the state of the environment (atmospheric air, precipitation, surface water, soil), environmental expertise.	Testing, multi-level tasks and assignments	Test assignments, lecture-discussion, round table method, lecture-discussion
LO8	Defines solutions to educational, practical and professional tasks in the ability to act competently in case of accidents, catastrophes and emergency situations, as well as for guidance and supervision in the preparation of rescue operations.	Testing, multi-level tasks and assignments	Test assignments, lecture-discussion, round table method, lecture-discussion
LO9	Develops measures to ensure the safety of life, environmental protection, protection in emergency situations using international standards and standards of the Republic of Kazakhstan	Testing, multi-level tasks and assignments	Test assignments, lecture-discussion, round table method, lecture-discussion

LO_{10}	Formulates conclusions and proposals for improving an enterprise, organization, industry or country as a whole	Exam, thesis	Consultations, independent work, oral exam, thesis defense

9 Correlation of learning outcomes of the educational program with the labor functions of professional standards (if any)

Name of used professional standards	Professions at level of the SQF	Labor functions	Tasks	Learning Outcomes by LO
«Emergency rescue activities for hazardous production facilities»	Shift Supervisor of the Emergency Rescue Service for Maintenance of Hazardous Industrial Facilities	Labor function 1. Carrying out operations for the containment and elimination of an emergency situation.	Skill 1: Making decisions on conducting rescue and urgent response operations at the facilities and sites of organizations located in emergency zones. Skill 2: Monitoring changes in the situation within the emergency zone and making appropriate decisions.	LO_5 Evaluates the radiation, chemical and engineering condition of the work area, studying the basic requirements of regulatory documents in the field of fire and industrial safety and the basics of scientific research in the field of safety. LO_8 Defines solutions to educational, practical and professional tasks in the ability to act competently in case of accidents, catastrophes and emergency situations, as well as for guidance and supervision in the preparation of rescue operations. LO_9 Develops measures to ensure the safety of life, environmental protection, protection in emergency situations using international standards and standards of the Republic of Kazakhstan
		Labor Function 2: Maintaining constant readiness to participate in emergency rescue operations.	Skill 1: Establishing a reserve of personnel and resources for conducting emergency rescue operations.	LO9 Participates in the development of structures of production and technological, service and operational, and installation and adjustment units for oil and gas production, using the skills of collecting and systematizing data on technical supervision of the operation of drilling equipment in professional activities

" Hydrometeorology and ecology"	Environmental Engineer	Labor Function 1. Conducting environmental monitoring.	Skill 1. Planning, organizing, and coordinating the activities of the state observation network in the field of environmental monitoring.	LO_6 Provides knowledge on the development of regulatory, technical and environmental documentation related to environmental protection LO_7 He plans to organize and coordinate work on the implementation of systematic observations of the state of the environment (atmospheric air, precipitation, surface water, soil), environmental expertise. LO_9 Develops measures to ensure the safety of life, environmental protection, protection in emergency situations using international standards and standards of the Republic of Kazakhstan
«Occupational health and safety»	Occupational Health and Safety Engineer	Labor Function 1. Monitoring regulatory compliance and ensuring that the organization's departments comply with the legislative and other regulatory legal acts of the Republic of Kazakhstan on occupational safety and health.	Skill 1. Organizing and coordinating work within structural divisions to ensure compliance with legislative and other regulatory legal acts on occupational safety and health, as well as keeping them up to date.	LO_3 Analyzes working conditions and occupational risks at production facilities using methods of toxicological assessment, hygienic rationing, ergonomic analysis and special assessment of working conditions, in accordance with the requirements of labor legislation and regulatory documentation. LO_4 Designs engineering and technical solutions that ensure a safe working environment, including ventilation systems, electrical safety, engineering communications and protection from hazardous factors, taking into account the reliability of technical systems, requirements and standards of occupational safety.
		Labor Function 2. Participating in the organization and delivery of training and professional development for employees in the field of occupational	Skill 1. Organizing and identifying training needs in occupational safety and health, taking into account the requirements of relevant regulatory legal acts, and preparing the training process for employees of structural	

		safety and health.	divisions.	
		Labor Function 3. Organizing, preparing, and conducting activities aimed at monitoring and reducing occupational risk levels.	Skill 1. Planning and organizing occupational risk management activities.	
		Labor Function 4. Ensuring internal control over occupational safety and health conditions in workplaces.	Skill 1. Planning and organizing activities for internal control of occupational safety and health, coordinating actions, and monitoring the implementation of occupational safety and health measures.	
			Skill 2. Monitoring the implementation of the list of recommended measures to improve working conditions, developed based on the results of the assessment of working conditions.	
		Labor Function 5. Ensuring the effective functioning of the organization's occupational safety and health management system.	Skill 1. Participating in monitoring the development and implementation by the organization's structural divisions of measures to improve working conditions and occupational safety.	

		Labor Function 6. Ensuring the investigation and recording of occupational accidents and occupational diseases.	Skill 1. Collecting, systematizing, and analyzing information on the circumstances of accidents for documentation, preparation of materials, and completion of document forms during the investigation of occupational accidents and occupational diseases.	
		Labor Function 7. Monitoring regulatory compliance and ensuring that the organization's departments comply with the legislative and other regulatory legal acts of the Republic of Kazakhstan on occupational safety and health (Job Functions 8–12 — Occupational Safety and Health Engineer, Category II).	Skill 1. Developing regulatory and technical documents (procedures, instructions, and standards) in the field of occupational safety and health and ensuring that the organization's departments are provided with them.	

		Labor Function 8. Organizing and conducting training and professional development for employees in the field of occupational safety and health.	Skill 1. Preparing for the training of employees in occupational safety and health.	
		Labor Function 9. Participating in ensuring internal control over occupational safety and health conditions in workplaces.	Skill 1. Developing skills in conducting internal control and inspections of employees' compliance with occupational safety and health requirements in the workplace.	
			Skill 2. Maintaining occupational safety and health documentation.	

10 Graduate model

GRADUATE MODEL			
Professional standard «Labor protection», «*Occupational health and safety*», «*Hydrometeorology and ecology*», «*Emergency rescue activities for hazardous*», *the sectoral Atlas and the regional Atlas of occupations and competencies: "Personal Protective Equipment Developer for Harsh Working Conditions," "Environmental Analyst in the Extractive Industries," and "Industrial Safety Engineer."*	Competencies (Soft skills, digital skills)		
	Attributes of a graduate	Knowledge	Skills
	1. Organizational and managerial skills and document management 2. The ability to make decisions in non-standard and emergency situations 3. Competencies in the field of communication, instruction and professional training 4. Practical professional experience and proven qualifications 5. Higher professional education in the field of activity	Knowledge of regulatory legal acts, methodological documents and standards in ensuring industrial and fire safety, occupational safety, environmental monitoring and emergency rescue operations	1. Verification of compliance of working conditions with established standards 2. Monitoring compliance with instructions and regulations on occupational safety, safety and ecology 3. Checking the readiness of equipment and tools for safe operation 4. Monitoring the implementation of measures to prevent emergencies and eliminate the consequences of accidents 5. Maintaining documentation and reporting on established standards 6. Monitoring of environmental safety and environmental conditions
	Professional skills (hard skills)		
	- Management of the occupational safety and industrial risks system. - Organization and management of emergency rescue operations at hazardous production facilities. - Planning and conducting environmental monitoring and environmental protection activities. - Analysis of working conditions and implementation of labor protection measures. - Knowledge of methods of analysis, assessment and management of professional risks.		

Typical curriculum

Educational program «6B11230 Life Safety and Environmental Protection»

Модульдің № / № модуля / Module №	Пәннің № / № дисциплины / Discipline №	ОҚУ ПӘНДЕРІНІҢ АТАУЫ НАИМЕНОВАНИЕ УЧЕБНЫХ ДИСЦИПЛИН NAME OF TEACHING DISCIPLINES	Оқу пәнінің циклы (міндетті компонент / таңдау компоненті) Цикл учебных дисциплин (обязательный компонент / компонент по выбору) Educational disciplines cycle (compulsory component / component of choice)	Оқу пәнінің коды Код учебной дисциплины Educational discipline code	Семестр / semester	Кредиттер саны Количество кредитов Number of credits	Курстық жұмыс (жоба) Курсовая работа (проект) Course work (project)	Білім алушылардың жұмыс уақытының бюджеті сағатпен Бюджет рабочего времени (час) Budget of working time (hours)							Кафедра атауы / Наименование кафедры / Name of the department	Семестр бойынша бөлу Распределение по семестрам Distribution of semesters								Пән бойынша қорытынды бақылау (емтихан, дифференциалды сынақ, мемлекеттік емтихан, жоба және т.б.) / Форма итогового контроля по дисциплине (экзамен, дифференцированный зачет, государственный экзамен, проект и др.) / Final assessment form for the discipline (exam, differentiated credit, state exam, project, etc.)	Пән бойынша қорытынды бақылаудың форматы (ауызша, жазбаша, тесттілік, шығармашылық және т.б.) / Форма проведения итогового контроля по дисциплине (устно, письменно, тест, творческий и т. д.) / The format of the final assessment for the discipline (orally, in writing, test, creative, etc.)
								Барлық сағат / Всего часов / Total hours	Аудиториялық жұмыс / Аудиторная работа / Class work				ОБӨЖ / СРОП / IWST	БАӨЖ / СРО / IWS		1 КУРС / YEAR		2 КУРС / YEAR		3 КУРС / YEAR		4 КУРС / YEAR			
									Барлық аудит. сағат / Всего аудит. часов / Total classroom hours	оның ішінде / в том числе / including						1 Академиялық кезең / Academic period	2 Академиялық кезең / Academic period	3 Академиялық кезең / Academic period	4 Академиялық кезең / Academic period	5 Академиялық кезең / Academic period	6 Академиялық кезең / Academic period	7 Академиялық кезең / Academic period	8 Академиялық кезең / Academic period		
										Д / ЛК / Lec	СПС / СПЗ / SPL	ЛС / ЛЗ / LC				Семестрдағы апталар саны / Недель в семестре / Weeks in a semester									
																15	15	15	15	15	15	15	15		
																аптасына аудиториялық сағат / аудиторных часов в неделю / classroom hours per week									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
		/ /																							
	1	Шетел тілі Иностранный язык Foreign Language	ЖБП (МК) ООД (ОК) GED (CS)	IYa 1104-26 (1) IYa 1104-26 (1) IYa 1104-26 (1)	1	5		150	45		45		15	90	Барлық кафедралар Все кафедры All chairs	0 + 3 + 0								Емтихан Экзамен Examination	Басқа Другое More
	2	Қазақ (Орыс) тілі Казахский (Русский) язык Kazakh (Russian) Language	ЖБП (МК) ООД (ОК) GED (CS)	K(R)Ya 1105-26 (1) K(R)Ya 1105-26 (1) K(R)Ya 1105-26 (1)	1	5		150	45		45		15	90	Барлық кафедралар Все кафедры All chairs	0 + 3 + 0								Емтихан Экзамен Examination	Басқа Другое More
	3	Дене шынықтыру Физическая культура Physical Culture	ЖБП (МК) ООД (ОК) GED (CS)	PhK 1107-26 (1) PhK 1107-26 (1) PhK 1107-26 (1)	1	2		60	30		30			30	Барлық кафедралар Все кафедры All chairs	0 + 2 + 0								Емтихан Экзамен Examination	Басқа Другое More
	4	Қазақстан тарихы История Казахстана History of Kazakhstan	ЖБП (МК) ООД (ОК) GED (CS)	IK 1101-26 IK 1101-26 IK 1101-26	1	5		150	45	30	15		15	90	Барлық кафедралар Все кафедры All chairs	2 + 1 + 0								Емтихан Экзамен Examination	Басқа Другое More
	5	Шетел тілі Иностранный язык Foreign Language	ЖБП (МК) ООД (ОК) GED (CS)	IYa 1104-26 (2) IYa 1104-26 (2) IYa 1104-26 (2)	2	5		150	45		45		15	90	Барлық кафедралар Все кафедры All chairs		0 + 3 + 0							Емтихан Экзамен Examination	Басқа Другое More
	6	Қазақ (Орыс) тілі Казахский (Русский) язык Kazakh (Russian) Language	ЖБП (МК) ООД (ОК) GED (CS)	K(R)Ya 1105-26 (2) K(R)Ya 1105-26 (2) K(R)Ya 1105-26 (2)	2	5		150	45		45		15	90	Барлық кафедралар Все кафедры All chairs		0 + 3 + 0							Емтихан Экзамен Examination	Басқа Другое More
	7	Ақпараттық-коммуникациялық технологиялар Информационно-коммуникационные технологии Information and Communication Technologies	ЖБП (МК) ООД (ОК) GED (CS)	IKT 1106-26 IKT 1106-26 IKT 1106-26	2	5		150	45	15		30	15	90	Барлық кафедралар Все кафедры All chairs		1 + 0 + 2							Емтихан Экзамен Examination	Басқа Другое More
	8	Дене шынықтыру Физическая культура Physical Culture	ЖБП (МК) ООД (ОК) GED (CS)	PhK 1107-26 (2) PhK 1107-26 (2) PhK 1107-26 (2)	2	2		60	30		30			30	Барлық кафедралар Все кафедры All chairs		0 + 2 + 0							Емтихан Экзамен Examination	Басқа Другое More
	9	Экономика, кәсіпкерлік, құқық және қаржылық сауаттылық модулі (экономика және кәсіпкерліктің негіздері, құқық негіздері және сыбайлас жемқорлыққа қарсы мәдениет, қаржылық сауаттылық негіздері) Модуль экономики, предпринимательства, права и финансовой грамотности (основы экономики и предпринимательства, основы права и антикоррупционная культура, основы финансовой грамотности) Module of Economics, Entrepreneurship, Law and Financial Literacy (Fundamentals of Economics and Entrepreneurship, Fundamentals of Law and Anti-corruption Culture, Fundamentals of Financial Literacy)	ЖБП (ЖК) ООД (ВК) GED (EC)	MEPPFG 1101-26 MEPPFG 1101-26 MEPPFG 1101-26	2	5		150	45	30	15		15	90	Барлық кафедралар Все кафедры All chairs		2 + 1 + 0							Емтихан Экзамен Examination	Басқа Другое More
	10	Дене шынықтыру Физическая культура Physical Culture	ЖБП (МК) ООД (ОК) GED (CS)	PhK 1107-26 (3) PhK 1107-26 (3) PhK 1107-26 (3)	3	2		60	30		30			30	Дене шынықтыру Физическое воспитание physical education			0 + 2 + 0						Емтихан Экзамен Examination	Басқа Другое More
	11	Әлеуметтік-саяси білім модулі (әлеуметтану, саясаттану, мәдениеттану, психология) Модуль социально-политических знаний (политология, социология, культурология, психология) Module of Socio-Political Knowledge (Political Science, Sociology, Cultural Studies, Psychology)	ЖБП (МК) ООД (ОК) GED (CS)	MSPZ 2103-26 MSPZ 2103-26 MSPZ 2103-26	3	8		240	120	60	60		15	105	Барлық кафедралар Все кафедры All chairs			4 + 4 + 0						Емтихан Экзамен Examination	Басқа Другое More
	12	Философия Философия Philosophy	ЖБП (МК) ООД (ОК) GED (CS)	Fil 2102-26 Fil 2102-26 Fil 2102-26	4	5		150	45	30	15		15	90	Әлеуметтік-гуманитарлық пәндер Социально-гуманитарные дисциплины Socio-humanitarian disciplines				2 + 1 + 0					Емтихан Экзамен Examination	Басқа Другое More
	13	Дене шынықтыру Физическая культура Physical Culture	ЖБП (МК) ООД (ОК) GED (CS)	PhK 1107-26 (4) PhK 1107-26 (4) PhK 1107-26 (4)	4	2		60	30		30			30	Барлық кафедралар Все кафедры All chairs				0 + 2 + 0					Емтихан Экзамен Examination	Басқа Другое More
	14	Физика Физика Physics	БП (ЖК) БД (ВК) BD (EC)	Fiz 1203-26 Fiz 1203-26 Fiz 1203-26	1	4		120	45	15	15	15	15	60	Ақпараттық технология Информационные технологии Information technology	1 + 1 + 1								Емтихан Экзамен Examination	Басқа Другое More
	15	Өндірістік токсикология Промышленная токсикология Industrial Toxicology	БП (ЖК) БД (ВК) BD (EC)	PT 1205-26 PT 1205-26 PT 1205-26	1	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology	1 + 2 + 0								Емтихан Экзамен Examination	Басқа Другое More

Модуль / Module № 1

	16	Мамандыкпен таныстыру Введение в специальность Introduction to the specialty	БП (ЖК) БД (ВК) BD (EC)	VS 1202-26 VS 1202-26 VS 1202-26	2	3		90	30	15	15		15	45	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology		1 + 1 + 0							Емтихан Экзамен Examination	Басқа Другое More
	17	Жалпы химия Общая химия General Chemistry	БП (ЖК) БД (ВК) BD (EC)	OH 1204-26 OH 1204-26 OH 1204-26	2	5		150	45	15	15	15	15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology		1 + 1 + 1							Емтихан Экзамен Examination	Басқа Другое More
	18	Жану және жарылыс теориясы Теория горения и взрыва Theory of Combustion and Explosion	БП (ЖК) БД (ВК) BD (EC)	TGV 2203-26 TGV 2203-26 TGV 2203-26	3	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology			1 + 2 + 0						Емтихан Экзамен Examination	Басқа Другое More
	19	Қоршаған орта мониторингі Мониторинг окружающей среды Environmental Monitoring	БП (ЖК) БД (ВК) BD (EC)	MOS 2205-26 MOS 2205-26 MOS 2205-26	3	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology			1 + 2 + 0						Емтихан Экзамен Examination	Басқа Другое More
	20	Өнеркәсіптік қауіпсіздік саласындағы ғылыми зерттеулердің негіздері Основы научных исследований в области промышленной безопасности Fundamentals of Scientific Research in the Field of Industrial Safety	БП (ЖК) БД (ВК) BD (EC)	ONIPB 2207-26 ONIPB 2207-26 ONIPB 2207-26	4	3		90	30	15	15		15	45	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology				1 + 1 + 0					Емтихан Экзамен Examination	Басқа Другое More
	21	Өндірістік практика I Производственная практика I Industrial Practice I	БП (ЖК) БД (ВК) BD (EC)	PP 1-26 (BZhDiZOS) PP 1-26 (BZhDiZOS) PP 1-26 (BZhDiZOS)	4	5		150	0						Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology				5 апта / недель / weeks					Практика сынының қорытынды бағa Итоговая оценка по практике	Басқа Другое More
	22	Радиациялық қауіпсіздік негіздері Основы радиационной безопасности Radiation Safety Basics	БП (ЖК) БД (ВК) BD (EC)	ORB 3208-26 ORB 3208-26 ORB 3208-26	5	5		150	45	30	15		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology					2 + 1 + 0				Емтихан Экзамен Examination	Басқа Другое More
	23	Тұрақты даму, экология және тіршілік қауіпсіздігі Устойчивое развитие, экология и безопасность жизнедеятельности Sustainable Development, Ecology, and Life Safety	БП (ЖК) БД (ВК) BD (EC)	UREBZh 3207-26 UREBZh 3207-26 UREBZh 3207-26	6	5		150	45	30	15		15	90	Барлық кафедралар Все кафедры All chairs						2 + 1 + 0			Емтихан Экзамен Examination	Басқа Другое More
	24	Өндірістік тәжірибе II Производственная практика II Production Practice II	БП (ЖК) БД (ВК) BD (EC)	PP 2-26 (BZhDiZOS) PP 2-26 (BZhDiZOS) PP 2-26 (BZhDiZOS)	6	5		150	0						Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology						5 апта / недель / weeks			Практика сынының қорытынды бағa Итоговая оценка по практике	Басқа Другое More
	25	Диплом алдындағы/Өндірістік тәжірибе Преддипломная / Производственная практика Undergraduate/Production Practice	БП (ЖК) БД (ВК) BD (EC)	PDP/PP 26 (BZhDiZOS) PDP/PP 26 (BZhDiZOS) PDP/PP 26	8	7		210	0						Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology							7 апта / недель / weeks		Практика сынының қорытынды бағa Итоговая оценка по практике Total mark on practice	Басқа Другое More
	26	Еңбек қауіпсіздігі және еңбекті қорғау Безопасность и охрана труда Occupational Safety and Health	БеП (ЖК) ПД (ВК) PD (EC)	BOT 4301-26 BOT 4301-26 BOT 4301-26	7	5		150	45	30	15		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology								2 + 1 + 0	Емтихан Экзамен Examination	Басқа Другое More
Барлығы модуль бойынша / Итого по модулю / Total for module						**118**		**3540**	**1020**	**360**	**600**	**60**	**285**	**1725**												
								/ /																		
Модуль / Module № 2	1	Сызба геометриясы Начертательная геометрия Descriptive Geometry	БП (ТК) БД (КВ) BD (UC)	NG 1203-26 NG 1203-26 NG 1203-26	1	4		120	45	15	30		15	60	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology	1 + 2 + 0								Емтихан Экзамен Examination	Басқа Другое More
	2	Инженерлік графика Инженерная графика Engineering Graphics		IG 1203-26 IG 1203-26 IG 1203-26																						
Барлығы модуль бойынша / Итого по модулю / Total for module						**4**		**120**	**45**	**15**	**30**	**0**	**15**	**60**												
								/ /																		
Модуль / Module № 3	1	Техникалық жүйелердің сенімділігі және өндірістік тәуекелдер Надежность технических систем и производственные риски Reliability of Technical Systems and Production Risks	БП (ТК) БД (КВ) BD (UC)	NTSPR 2204-26 NTSPR 2204-26 NTSPR 2204-26	3	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology			1 + 2 + 0						Емтихан Экзамен Examination	Басқа Другое More
	2	Еңбек қауіпсіздігі саласындағы тәуекелдерді басқару Управление рисками в области безопасности труда Occupational Safety Risk Management		UROBT 2204-26 UROBT 2204-26 UROBT 2204-26																						
Барлығы модуль бойынша / Итого по модулю / Total for module						**5**		**150**	**45**	**15**	**30**	**0**	**15**	**90**												
								/ /																		
Модуль / Module № 4	1	Жасанды интеллектке кіріспе (Minor) Введение в искусственный интеллект (Minor) Introduction to Artificial Intelligence (Minor)	БП (ТК) БД (КВ) BD (UC)	VII 2200-26 (Minor 1) VII 2200-26 (Minor 1)	4	5		150	45	30	15		15	90	Барлық кафедралар Все кафедры All chairs					2 + 1 + 0				Емтихан Экзамен Examination	Басқа Другое More
	2	Стандарттау, сертификаттау және метрология Стандартизация, сертификация и метрология Standardization, Certification, and Metrology		SSM 2202-26 SSM 2202-26 SSM 2202-26																						
Барлығы модуль бойынша / Итого по модулю / Total for module						**5**		**150**	**45**	**30**	**15**	**0**	**15**	**90**												
								/ /																		
Модуль / Module № 5	1	Сейсмологиялық зерттеулер Сейсмологические исследования Seismological Research	БП (ТК) БД (КВ) BD (UC)	SI 2207-26 SI 2207-26 SI 2207-26	4	5		150	45	30	15		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology					2 + 1 + 0				Емтихан Экзамен Examination	Басқа Другое More
	2	Термодинамика, жылу беру және гидравлика Термодинамика, теплопередача и гидравлика Thermodynamics, Heat Transfer, and Hydraulics		TTG 2207-26 TTG 2207-26 TTG 2207-26																						
Барлығы модуль бойынша / Итого по модулю / Total for module						**5**		**150**	**45**	**30**	**15**	**0**	**15**	**90**												
								/ /																		
Модуль / Module № 6	1	Электр және жылу энергетикасындағы жұмыс қауіпсіздігі Безопасность производства работ в электро и теплоэнергетике Safety of Work in the Electric and Heat Power Industry	БП (ТК) БД (КВ) BD (UC)	BPRET 3205-26 BPRET 3205-26 BPRET 3205-26	5	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology							1 + 2 + 0		Емтихан Экзамен Examination	Басқа Другое More
	2	Өнеркәсіптік кәсіпорындардың электр қауіпсіздігі Электробезопасность промышленных предприятий Electrical Safety of Industrial Enterprises		EPP 3205-26 EPP 3205-26 EPP 3205-26																						
Барлығы модуль бойынша / Итого по модулю / Total for module						**5**		**150**	**45**	**15**	**30**	**0**	**15**	**90**												

Модуль / Module № 7																											
	1	Өндірістердің жарылыс өрт қауіпсіздігі Взрывопожаробезопасность производства Explosion and Fire Safety of Production	БП (ТК) БД (КВ) BD (UC)	VPBP 3209-26 VPBP 3209-26 VPBP 3209-26	5	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology					1 + 2 + 0				Емтихан Экзамен Examination	Басқа Другое More
	2	Өрт қауіпсіздігі Пожарная безопасность Fire Safety		PB 3209-26 PB 3209-26 PB 3209-26																						
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	15	30	0	15	90													
Модуль / Module № 8																											
	1	Төтенше жағдайлар кезіндегі техникалық шешімдер мен қорғау әдістері Технические решения и методы защиты в чрезвычайных ситуациях Technical Solutions and Methods of Protection in Emergency Situations	БП (ТК) БД (КВ) BD (UC)	TRMZChS 3210-26 TRMZChS 3210-26 TRMZChS 3210-26	5	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology					1 + 2 + 0				Емтихан Экзамен Examination	Басқа Другое More
	2	Төтенше жағдайлар кезінде зардап шеккендерге шұғыл көмек Экстренная помощь пострадавшим при чрезвычайных ситуациях Emergency Assistance to Victims in Emergency Situations		EPPChS 3210-26 EPPChS 3210-26 EPPChS 3210-26																						
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	15	30	0	15	90													
Модуль / Module № 9																											
	1	Еңбекті ұйымдастырудың кешенді жүйесі Комплексная система организации труда Comprehensive Labor Management System	БП (ТК) БД (КВ) BD (UC)	KSOT 3206-26 KSOT 3206-26 KSOT 3206 -26	6	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology						1 + 2 + 0			Емтихан Экзамен Examination	Басқа Другое More
	2	Эргономика және жұмыс орындарын ұйымдастыру Эргономика и организация рабочих мест Ergonomics and Workplace Organization		EORM 3206-26 EORM 3206-26 EORM 3206-26																						
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	15	30	0	15	90													
Модуль / Module № 10																											
	1	Материалтану және құрылымдық материалдардың технологиясы Материаловедение и технология конструкционных материалов Materials Science and Technology of Structural Materials	БП (ТК) БД (КВ) BD (UC)	MTKM 3203-26 MTKM 3203-26 MTKM 3203-26	6	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology						1 + 2 + 0			Емтихан Экзамен Examination	Басқа Другое More
	2	Өнеркәсіптік желдету Промышленная вентиляция Industrial Ventilation		PV 3203-26 PV 3203-26 PV 3203-26																						
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	15	30	0	15	90													
Модуль / Module № 11																											
	1	ТҚҚ және ҚОО нормативті-құқық аспектілері Нормативно-правовые аспекты БЖД и ООС Regulatory Aspects of Life Safety and Environmental Protection	БП (ТК) БД (КВ) BD (UC)	NPABZhDiOOS 4208-26 NPABZhDiOOS 4208-26 NPABZhDiOOS [illegible]	8	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology								1 + 2 + 0	Емтихан Экзамен Examination	Басқа Другое More
	2	Қауіпті өндірістік объектілердегі авариялық-құтқару жұмыстары Аварийно-спасательные работы на опасных производственных объектах Emergency Rescue Operations at Hazardous Production Facilities		ASROPO 4208-26 ASROPO 4208-26 ASROPO 4208-26																						
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	15	30	0	15	90													
Модуль / Module № 12																											
	1	Жұмыс орнының гигиенасы және санитариясы Гигиена и санитария рабочего места Hygiene and Sanitation of the Workplace	БеП (ТК) ПД (КВ) PD (UC)	GSRM 2302-26 GSRM 2302-26 GSRM 2302-26	3	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology				1 + 2 + 0					Емтихан Экзамен Examination	Басқа Другое More
	2	Өндірістік санитария және еңбектің гигиенасы Производственная санитария и гигиена труда Industrial Sanitation and Occupational Health		PSGT 2302-26 PSGT 2302-26 PSGT 2302-26																						
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	15	30	0	15	90													
Модуль / Module № 13																											
	1	Табиғи және техногендік сипаттағы төтенше жағдайлардың алдын алу және оларды жою Предупреждение и ликвидация чрезвычайных ситуаций природного и техногенного характера Prevention and Elimination of Natural and Man-Made Emergencies	БеП (ТК) ПД (КВ) PD (UC)	PLChSPTH 2311-26 PLChSPTH 2311-26 PLChSPTH 2311-26	4	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology					1 + 2 + 0				Емтихан Экзамен Examination	Басқа Другое More
	2	Өнеркәсіптік экология Промышленная экология Industrial Ecology		PE 2311-26 PE 2311-26 PE 2311-26																						
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	15	30	0	15	90													
Модуль / Module № 14																											
	1	Инженерлік жүйелер және кондырғы торлары Инженерные системы и сети оборудования Engineering Systems and Network Equipment	БеП (ТК) ПД (КВ) PD (UC)	ISSO 3301-26 ISSO 3301-26 ISSO 3301-26	5	5		150	45	30	15		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology					2 + 1 + 0				Емтихан Экзамен Examination	Басқа Другое More
	2	Жасанды нейрондық желілерді әзірлеу (Minor) Разработка искусственных нейронных сетей (Minor) Development of Artificial Neural Networks (Minor)		RINS 3300-26 (Minor 2) RINS 3300-26 (Minor 2) RINS 3300-26 (Minor 2)																						
	3	Инженерлік коммуникациялардың қауіпсіздігі Безопасность инженерных коммуникаций Security of Engineering Communications		BIK 3301-26 BIK 3301-26 BIK 3301-26																						
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	30	15	0	15	90													

Модуль / Module № 15	1	Объектілерді басқарудағы жасанды интеллект (Minor) Искусственный интеллект в управлении объектами (Minor) Artificial Intelligence in Object Management (Minor)	БеП (ТК) ПД (КВ) PD (UC)	IIUO 3301-26 (Minor 3) IIUO 3301-26 (Minor 3) IIUO 3301-26 (Minor 3)	5	5		150	45	15	30		15	90	Барлық кафедралар Все кафедры All chairs					1 + 2 + 0				Емтихан Экзамен Examination	Басқа Другое More
	2	Өндіріс және тұтыну қалдықтарын басқару Управление отходами производства и потребления Production and Consumption Waste Management		UOPP 3304-26 UOPP 3304-26 UOPP 3304-26																					
	3	Қатты қалдықтарды басқару Управление твердыми отходами Solid Waste Management		UTO 3304-26 UTO 3304-26 UTO 3304-26																					
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	15	30	0	15	90											
							/ /																		
Модуль / Module № 16	1	Химиялық және биологиялық қауіпсіздік негіздері Основы химической и биологической безопасности Basics of Chemical and Biological Safety	БеП (ТК) ПД (КВ) PD (UC)	OHBB 3309-26 OHBB 3309-26 OHBB 3309-26	6	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology						1 + 2 + 0			Емтихан Экзамен Examination	Басқа Другое More
	2	Химия өнеркәсібінің қауіпсіз жағдайларын қамтамасыз ету Обеспечение безопасных условий в химической промышленности Ensuring Safe Conditions for the Chemical Industry		OBUHP 3309-26 OBUHP 3309-26 OBUHP 3309-26																					
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	15	30	0	15	90											
							/ /																		
Модуль / Module № 17	1	Азаматтық қорғанысты ұйымдастыру және жүргізу Организация и ведение гражданской обороны Organization and Conduct of Civil Defense	БеП (ТК) ПД (КВ) PD (UC)	OVGO 3313-26 OVGO 3313-26 OVGO 3313-26	6	5		150	45	30	15		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology						2 + 1 + 0			Емтихан Экзамен Examination	Басқа Другое More
	2	ТЖ кезінде құтқару ісінің негіздері Основы спасательного дела при ЧС Fundamentals of Rescue Work in Emergency Situations		OSDChS 3313-26 OSDChS 3313-26 OSDChS 3313-26																					
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	30	15	0	15	90											
							/ /																		
Модуль / Module № 18	1	Экологиялық сараптама Экологическая экспертиза Environmental Expertise	БеП (ТК) ПД (КВ) PD (UC)	EE 4303-26 EE 4303-26 EE 4303-26	7	5		150	45	30	15		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology							2 + 1 + 0		Емтихан Экзамен Examination	Басқа Другое More
	2	Қоршаған ортаға әсерді бағалау Оценка воздействия на окружающую среду Environmental Impact Assessment		OVOS 4303-26 OVOS 4303-26 OVOS 4303-26																					
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	30	15	0	15	90											
							/ /																		
Модуль / Module № 19	1	Ауа бассейнін ластанудан қорғау Охрана воздушного бассейна от загрязнений Protection of the Air Basin from Pollution	БеП (ТК) ПД (КВ) PD (UC)	OVBZ 4305-26 OVBZ 4305-26 OVBZ 4305-26	7	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology							1 + 2 + 0		Емтихан Экзамен Examination	Басқа Другое More
	2	Атмосфералық ауаны қорғауға арналған процестер мен құрылғылар Процессы и аппараты защиты атмосферного воздуха Processes and Devices for Protection of Atmospheric Air		PAZAV 4305-26 PAZAV 4305-26 PAZAV 4305-26																					
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	15	30	0	15	90											
							/ /																		
Модуль / Module № 20	1	Табиғи және ағынды суларды тазарту Очистка природных и сточных вод Natural and Waste Water Treatment	БеП (ТК) ПД (КВ) PD (UC)	OPSV 4306-26 OPSV 4306-26 OPSV 4306-26	7	5		150	45	30	15		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology							2 + 1 + 0		Емтихан Экзамен Examination	Басқа Другое More
	2	Ағынды суларды тазарту техникасы және технологиясы Техника и технология очистки сточных вод Wastewater Treatment Equipment and Technology		TTOSV 4306-26 TTOSV 4306-26 TTOSV 4306-26																					
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	30	15	0	15	90											
							/ /																		
Модуль / Module № 21	1	Жасанды интеллектке негізделген автоматтандырылған жобалау жүйелері Основы САПР с применением искусственного интеллекта Fundamentals of AI-Based Automated Design Systems	БеП (ТК) ПД (КВ) PD (UC)	OSAPRII 4307-26 OSAPRII 4307-26 OSAPRII 4307-26	7	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology							1 + 2 + 0		Емтихан Экзамен Examination	Басқа Другое More
	2	Тазарту құрылғыларын жобалау негіздері Основы проектирования очистных устройств Basics of Design of Sewage Treatment Plants		OPOU 4307-26 OPOU 4307-26 OPOU 4307-26																					
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	15	30	0	15	90											
							/ /																		
Модуль / Module № 22	1	Жер ресурстарын қорғау және тиімді пайдалану Охрана и рациональное использование земельных ресурсов Protection and Rational Use of Land Resources	БеП (ТК) ПД (КВ) PD (UC)	ORIZR 4312-26 ORIZR 4312-26 ORIZR 4312-26	7	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology							1 + 2 + 0		Емтихан Экзамен Examination	Басқа Другое More
	2	Қоршаған ортаны және адам денсаулығын қорғау Защита окружающей среды и здоровье человека Environmental Protection and Human Health		ZOSZCh 4312-26 ZOSZCh 4312-26 ZOSZCh 4312-26																					
Барлығы модуль бойынша / Итого по модулю / Total for module						5		150	45	15	30	0	15	90											
							/ /																		
Module № 23	1	Өндірістік процесстердің қауіпсіздігі Безопасность производственных процессов Safety of Production Processes	БеП (ТК) ПД (КВ) PD (UC)	BPP 4308-26 BPP 4308-26 BPP 4308-26												Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology									Емтихан Экзамен Examination	Басқа Другое More

Модуль /	2	Қоршаған ортаны инженерлік қорғау Инженерная защита окружающей среды Engineering Environmental Protection	ПД (КВ) PD (UC)	IZOS 4308-26 IZOS 4308-26 IZOS 4308-26	6	5		150	45	30	15		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology								2 + 1 + 0	Емтихан Экзамен Examination	Басқа Другое More
Барлығы модуль бойынша / Итого по модулю / Total for module						**5**		**150**	**45**	**30**	**15**	**0**	**15**	**90**												
								/ /																		
Модуль / Module № 24	1	Өнеркәсіптік қауіпсіздік негіздері Основы промышленной безопасности Fundamentals of Industrial Safety	БеП (ТК) ПД (КВ) PD (UC)	OPB 4310-26 OPB 4310-26 OPB 4310-26	8	5		150	45	15	30		15	90	Химия, химиялық технология және экология Химия, химическая технология и экология Chemistry, chemical technology and ecology								1 + 2 + 0	Емтихан Экзамен Examination	Басқа Другое More
	2	Өнеркәсіптік қауіпсіздікті техникалық реттеу Техническое регулирование промышленной безопасности Technical Regulation of Industrial Safety		TRPB 4310-26 TRPB 4310-26 TRPB 4310-26																						
Барлығы модуль бойынша / Итого по модулю / Total for module						**5**		**150**	**45**	**15**	**30**	**0**	**15**	**90**												
Модуль / Module № 25	**Қорытынды аттестация / Итоговая аттестация / Final assessment**																									
	1	Қазақстан тарихы История Казахстана History of Kazakhstan			1	5		150								5										
	2	Қорытынды аттестаттау Итоговая аттестация Final certification			2	8		240																6 апта / неделя / weeks		
Барлығы модуль бойынша / Итого по модулю / Total for module						**13**		**390**	**0**	**0**	**0**	**0**	**0**	**0**												
БАРЛЫҚТЫ МОДУЛЬДАР БОЙЫНША / ИТОГО ПО МОДУЛЯМ / TOTAL FOR MODULES						**240**		**3810**	**1035**	**450**	**585**	**0**	**345**	**2040**												

Expert opinion

for the educational program: 6B11230 Life Safety and Environmental Protection

in the area of training: B094 Sanitary and preventive measures

Name of the educational organization/enterprise - partner in the development of the educational program: LLP «Kazyna-SR»

General description of the educational program

The educational program is aimed at training highly qualified specialists with modern theoretical knowledge and practical skills necessary for professional activity in the relevant field. The program has been developed taking into account the requirements of the labor market, professional standards, modern scientific and technological achievements, as well as employers' needs.

The content of the program is focused on the formation of professional, research, managerial, and communication competencies that ensure graduates' competitiveness and readiness to solve professional tasks of varying complexity. Particular attention is given to developing analytical thinking, practical skills, and the ability for continuous professional development.

Description and evaluation of the structure of the educational program

The structure of the educational program complies with the requirements of current regulatory documents and ensures a consistent progression in the acquisition of necessary competencies by students. The curriculum includes cycles of general education, basic, and specialized disciplines aimed at forming fundamental knowledge and professional skills.

The content of the disciplines is interconnected and ensures the achievement of the intended learning outcomes. Practical training includes various types of internships that allow students to consolidate their knowledge in real professional conditions, gain experience in solving practical tasks, and master modern working methods.

The program also includes disciplines aimed at developing digital competencies, research skills, project management abilities, and professional communication skills. The methodological and instructional support of the program meets modern requirements and contributes to high-quality specialist training.

General conclusion

The presented educational program complies with modern educational standards and employers' requirements, ensures the formation of necessary professional competencies, and prepares in-demand specialists for the labor market. The structure and content of the program are relevant, balanced, and practice-oriented.

The educational program is recommended for implementation and is suitable for training specialists capable of effectively performing professional activities in the relevant field and adapting to modern labor market requirements.

Recommendations for improving the educational program

In order to update and improve the educational program, it is recommended to introduce the following disciplines: "Introduction to the Specialty," "Integrated System of Labor Organization," and "Environmental Protection and Human Health," as well as to revise the titles and content of existing disciplines by replacing "Fundamentals of Toxicology" with "Industrial Toxicology" and "Fundamentals of CAD" with "Fundamentals of CAD with the Application of Artificial Intelligence." These changes are aimed at enhancing the relevance and practical orientation of the educational program.

Expert
Director LLP «Kazyna-SR» Mataibaev A.

KAZYNA-SR
ДЛЯ ДОКУМЕНТОВ

Expert opinion

for the educational program: 6B11230 Life Safety and Environmental Protection

in the area of training: B094 Sanitary and preventive measures

Name of the educational organization/enterprise - partner in the development of the educational program: JSC "Kentau Transformer Plant", Kentau, Kazakhstan

General description of the educational program

The educational program is aimed at training specialists with modern knowledge and practical skills in the field of industrial, environmental, and sanitary safety. The program takes into account current requirements for professional training and is focused on ensuring safe working conditions, reducing occupational risks, and protecting the environment.

Special attention is given to the development of professional thinking, the ability to analyze potential threats, and to make effective decisions in the field of occupational safety and life safety. The content of the program corresponds to current industry trends and contributes to the preparation of in-demand specialists.

Description and evaluation of the structure of the educational program

The curriculum includes disciplines that provide comprehensive training of students in occupational safety, industrial ecology, civil protection, and sanitary and hygienic control. The structure of the program is characterized by a practical orientation and a consistent progression in the development of professional competencies.

Practical and professional training promotes the development of skills in working with regulatory documentation, conducting risk assessments, and organizing measures to ensure workplace safety. The content of the courses corresponds to the stated learning outcomes and employers' requirements.

General conclusion

The educational program complies with modern educational standards and ensures high-quality training of specialists for various sectors of the economy. Graduates of the program possess the necessary level of professional preparation, enabling them to effectively perform activities in the field of occupational safety and environmental protection.

Recommendations for improving the educational program

It is recommended to include the discipline "Integrated Occupational Work Organization System" in the educational program in order to develop students' modern approaches to organizing safe and efficient work activities.

Chairman of the Board
JSC "Kentau Transformer Plant"

Khudaibergenov B.A.

«27» 11 2025 y.

Expert opinion

for the educational program: 6B11230 Life safety and environmental protection
in the area of training: B094 Sanitary preventive measures
Name of the educational organization/enterprise - partner in the development of the educational program: Research Institute for Labor Protection, Astana, Kazakhstan

General characteristics of the educational program

The educational program «6B11230 Life Safety and Environmental Protection»has been developed in accordance with the National Qualifications Framework, professional standards, and modern labor market requirements. The relevance of the program is driven by the growing need for qualified specialists in the field of occupational safety, industrial safety, and environmental protection.

The program is aimed at developing students' professional competencies required to ensure the safety of production activities, protect the environment, and prevent emergency situations. The content of the educational program meets employers' requirements and is focused on training competitive specialists with both theoretical knowledge and practical skills.

Description and evaluation of the educational program structure

The structure of the educational program is logically designed and includes basic and profile disciplines that ensure comprehensive training of students. The content of the disciplines corresponds to the competency-based graduate model and is aimed at developing professional, analytical, and practical skills.

Professional internships are organized at specialized enterprises and allow students to consolidate their acquired knowledge in real production conditions. The educational process is practice-oriented and focused on the application of modern methods of occupational safety and environmental monitoring.

General conclusion

The educational program meets the modern requirements of the higher education system and the needs of the labor market. Training of specialists is carried out at a high methodological and professional level. The program ensures the development of competent and in-demand specialists in the field of life safety and environmental protection.

Recommendations for using or improving the educational program

It is recommended to further develop practice-oriented learning, expand cooperation with employers, and update the content of disciplines in accordance with modern requirements in occupational and environmental safety.

Taking into account the «Atlas of New Professions and Competencies», it is recommended to include the disciplines «Introduction to the Specialty», «Integrated Occupational Management System», and «Environmental Protection and Human Health», and to exclude the discipline «Physiology and Psychology of Labor».

Deputy Head of the Professional Risk Assessment Center Republican Research Institute for Occupational Safety and Health of the Ministry of Labor and Social Protection of the Population of the Republic of Kazakhstan — **Ibrayeva A.B.**

Expert opinion

for the educational program: 6B11230 Life safety and environmental protection
in the area of training: B094 Sanitary preventive measures
Name of the educational organization/enterprise - partner in the development of the educational program: Tashkent Institute of Textile and Light Industry/ Uzbekistan, Tashkent

General characteristics of the educational program

The educational program is aimed at training qualified specialists in the fields of life safety, occupational health and safety, fire safety, and environmental protection. The program takes into account modern requirements for ensuring safe working conditions, preventing occupational injuries, minimizing environmental risks, and organizing measures for the prevention and elimination of emergency situations.

The content of the program is focused on the development of professional competencies in industrial safety, civil protection, fire prevention, and environmental control. Special attention is paid to preparing specialists capable of effectively operating in emergency situations, conducting risk assessments, and developing safety measures for industrial facilities.

Description and evaluation of the educational program structure

The structure of the educational program includes a set of basic and specialized disciplines aimed at studying occupational safety, fire safety, industrial ecology, civil protection, and emergency prevention. Academic disciplines ensure the development of practical skills in hazard analysis, organization of safe production processes, and development of measures for eliminating the consequences of accidents and emergency situations.

Professional internships and laboratory classes contribute to strengthening theoretical knowledge and developing competencies in conducting safety briefings, assessing occupational risks, organizing evacuation procedures, and ensuring fire safety at various facilities.

General conclusion

The educational program meets modern requirements of the higher education system and current labor market demands. Specialist training is carried out in accordance with contemporary approaches in occupational safety, fire safety, and emergency prevention. Graduates of the program possess the necessary knowledge and practical skills for professional activities in industrial, environmental, and emergency rescue sectors.

Recommendations for using or improving the educational program

It is recommended to continue improving and updating environmentally oriented disciplines in accordance with modern international requirements in the fields of sustainable development, environmental safety, and public health protection, including the introduction of the discipline "Environmental Protection and Human Health."

Associate Professor, PhD, Department of Occupational Safety and Ecology, Tashkent Institute of Textile and Light Industry — Arabov J.S.

International Academic Advisor Confirmation/ Шетелдік кеңесшінің қатысуы/ Участие зарубежного консультанта

Educational Program/ Білім беру бағдарламасы/ Образовательная программа	6B11230 Life safety and environmental protection/ 6B11230 Қоршаған ортаны қорғау және өмір тіршілігінің қауіпсіздігі/ 6B11230 Безопасность жизнедеятельности и защита окружающей среды
Level/ Дәрежесі/ Уровень	Bachelor/Бакалавр/Бакалавр
International Academic Advisor/ Шетелдік академиялық кеңесші/ Зарубежный консультант	Khudaiberdieva Dilfuza Bakhramovna/ Худайбердиева Дилфуза Бахрамқызы/ Худайбердиева Дилфуза Бахрамовна
Academic degree/ Ғылыми дәреже/ Ученая степень	Doctor of Technical Sciences/Техника ғылымдарының докторы/Доктор технических наук
Position/ Лауазымы/ Должность	Professor/Профессор/Профессор
University/ Университет/ Университет	Tashkent Institute of Textile and Light Industry/ Ташкент тоқыма және жеңіл өнеркәсіп институты/ Ташкентский институт текстильной и легкой промышленности
Country/ Ел/ Страна	Uzbekistan/ Өзбекстан /Узбекистан

Approved/ Келісілді/ Согласовано

The educational program has been reviewed and approved. The updated content of the educational program, the sequence of courses, and the revised learning outcomes (LO) have been developed in accordance with modern academic approaches.

Білім беру бағдарламасы қарастырылып, келісілді. Білім беру бағдарламасының жаңартылған мазмұны, пәндерді оқу реттілігі және жаңартылған оқу нәтижелері (ОН) заманауи академиялық тәсілдерге сәйкес әзірленді.

Образовательная программа рассмотрена и согласована. Актуализированное содержание образовательной программы, последовательность изучения дисциплин и обновленные результаты обучения (РО) сформированы с учетом современных академических подходов.

International Academic Advisor/ Шетелдік академиялық кеңесші/ Зарубежный консультант	D. Khudaiberdieva/ Д. Худайбердиева/ Д. Худайбердиева	(Signature/ Қолы/ Подпись)	27.11.2025 г. (Date/ Күні/ Дата)
Seal/ МО/ МП			