Ф.7.02-10

MINISTRY OF SCIENCES AND HIGHER EDUCATION OF THE REPUBLIC OF KAZAKHSTAN
M. AUEZOV SOUTH KAZAKHSTAN UNIVERSITY

«APPROVED»
Chairman of the Board-Rector
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[illegible] 03 [illegible]25y.

EDUCATIONAL PROGRAM

6B11088(3) - Safety management and steady development

Registration Number	№ 6B11000001
Code and Classification of Education	6B11- Services
Code and Classification of Areas of Training	6B112-Hygiene and labor protection in the production
Group of educational programs (EP)	B094-Sanitation and prophylaxis measures
Type of EP	innovative
ISCE level	6
NQF level	6
IQF level	6
Language learning	Russian
The complexity of EP	240 credits
Distinctive features of EP	-
Partner University (JEP) -	-
University partner (DDEP) -	-

Shymkent, 2025

Developers:

Full name	Position	Signature
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Orman A. O.	Head: LLP "Water resources-Marketing"	
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Dostiyarov E.K.	Head of the Shymkent State Arboretum Park named after A.Askarov, Department for the Development of a comfortable Urban Environment in Shymkent	
Kushbai D.	Student of XT-23-4tk group	

The EP was considered at a meeting of the Academic Quality Committee of the or the Higher School "Chemical Engineering and Biotechnology", Minutes # 7 «13» 03. 2025 y.

Chairman of the Committee _____ Daurenbek N.M.

The EP was considered and recommended for approval at Educational-methodical meeting of M.Auezov SKU
Minutes #4-1«18» 03. 2025 y.

Chairman of the EMM _____ E.Imangaliyev

The EP was approved by the decision of the Academic Council of the University
Minutes # 10 « 27 » 03. 2025 y.

CONTENT

1 Concept of the Educational program

Mission of the University	Generating new competencies, training a leader who translates research thinking and culture.
University Values	– Openness - open to change, innovation and cooperation. – Creativity - generates ideas, develops them and turns them into values – Academic freedom - free to choose, develop and act. – Partnership - creates trust and support in a relationship where everyone wins. – Social responsibility - ready to fulfill obligations, make decisions and be responsible for their results.
Graduate Model	– Deep subject knowledge, their application and continuous expansion in professional activity – Information and digital literacy and mobility – Research skills, creativity and emotional intelligence – Entrepreneurship, independence and responsibility for their activities and well-being – Global and national citizenship, tolerance to cultures and languages
Uniqueness of the EP	the program was developed in accordance with the Atlas of New Professions and Competencies, and is aimed at training competent specialists for transport and logistics and scientific and pedagogical structures who are able to organize and manage the activities of a structural enterprise, independently determine the goals of professional activity, choose and justify methods and means to achieve them.
Academic Integrity and Ethics Policy	The university has taken measures to maintain academic integrity and academic freedom, protection from any type of intolerance and discrimination: • Rules of academic integrity (order No. 212 of October 10, 2022); • Anti-corruption standard (order No. 221 n/a dated 12/07/2021). • Code of Ethics (Order No. 212 of October 10, 2022).
Regulatory and legal framework for the development of EP	1.Law of the Republic of Kazakhstan "On Education"; 2. Model rules for the activities of educational organizations implementing educational programs of higher and (or) postgraduate education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 30, 2018 No. 595 with amendments and additions dated December 29, 2021. No. 614 3. Standard rules for admission to training in educational organizations implementing educational programs of higher and postgraduate education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 31, 2018 No. 600 with amendments and additions dated 06/02/2023. No. 252 4. State mandatory standards for higher and postgraduate education, approved by order of the Ministry of Education and Science of July 20, 2022 No. 2; 5. Rules for organizing the educational process in credit technology of education, approved by order of the Ministry of Education and

	Science of the Republic of Kazakhstan dated April 20, 2011 No. 152; with changes and additions from 09/23/2022. No. 79 6. Qualification reference book for positions of managers, specialists and other employees, approved by order of the Minister of Labor and Social Protection of the Population of the Republic of Kazakhstan dated December 30, 2020 No. 553. 7. Methodological recommendations for introducing ECTS principles into the educational process and expanding academic freedom. Appendix to the order of the Minister of Science and Higher Education. of the Republic of Kazakhstan dated February 12, 2024 No. 57 8. Guidelines for the development of educational programs for higher and postgraduate education, Appendix 1 to the order of the Director of the National Center for the Development of Higher Education of the Ministry of Education and Science of the Republic of Kazakhstan dated May 4, 2023 No. 601 n/k
Organization of the educational process	– Implementation of the principles of the Bologna Process – Student-centered learning – Availability – Inclusivity
Quality assurance of EP	– Internal quality assurance system – Involvement of stakeholders in the development of the EP and its evaluation – Systematic monitoring – Updating the content (updating)
Requirements for applicants	They are established in accordance with the Standard Rules for admission to training in educational organizations implementing educational programs of higher and postgraduate education by order of the Ministry of Education and Science of the Republic of Kazakhstan No. 600 dated October 31, 2018, with changes and additions dated Jule 26, 2024. №372
Conditions for the implementation of educational programs (EP) for persons with disabilities and special educational needs(SSN)	For students with SEN (special educational needs) and persons with disabilities (PSI), tactile PVC tiles, specially equipped toilets, a mnemonic diagram, and shower bars have been installed in educational buildings and student dormitories. Special parking spaces have been created. Crawler lift installed. There are desks for people with limited mobility (PLM), signs indicating the direction of movement, ramps. In the educational buildings (main building, building No. 8) there are 2 rooms with six working places adapted for users with disorders of the musculoskeletal system (DMS).For visually impaired users, the SARA™ CE Machine (2 pcs.) is available for scanning and reading books. The library website is adapted for the visually impaired. There is a special NVDA audio program with a service. The JIC website http://lib.ukgu.kz/ is open 24/7. An individual differentiated approach is provided for all types of classes and in the organization of the educational process.

2. Passport of the Educational program

Purpose of the EP	Training of competitive specialists in the labor market in safety management and sustainable development for state, local, regional and foreign organizations.
Tasks of the EP	– To promote the acquisition of skills in predicting and assessing security problems, the conditions for their effective use, the trend of their improvement ; – To form skills in the development and implementation of environmentally friendly solutions for energy supply, water supply, waste management and resource conservation ; – to form managerial skills with ecological thinking in the conditions of sustainable development ; - providing lifelong learning skills that will enable them to successfully adapt to changing conditions throughout their professional careers; - providing conditions for students to acquire a high general intellectual level of development, mastering literate and developed speech, a culture of thinking and the skills of scientific organization of labor in the field of sustainable development and security; - Creating conditions for the formation of in-demand knowledge and skills, a conscious attitude towards improving the well-being of the population and protecting the planet in the context of the SDGs .
Harmonizationof EP	• 6th level NationalframeworkRK qualifications ; • Dublin descriptors 6 skilllevel; • 1 cyclequalifyingframe _Europeanspacein higherabout education (A Framework for Qualification of the European Higher Education Area); • Level 6 European _ qualifyingframeworkForeducationVthroughout life (TheEuropeanQualificationFrameworkforlifelonglearning).
ConnectionEPWithprofessionalsphere	1. Industry qualification Framework "Industrial Safety Services" (dated October 25, 2019). Minutes of the Committee meeting No. 263 dated 26.12.2019 2.Professional standard "Risk management" dated 26.12.2019 No. 263.
Name of the degree awarded	After successful completion of this educational program, the graduate is awarded the degree: "Bachelor in Services according to EP 6B11088(3) - Safety management and steady development .
Scrollqualifications and positions	Graduatesaccording to EP"6B11088(3)- Safety management and steady development" canhold positions: production safety engineer, product managerstrategic and operational management of production safety , engineer-expert in the field of industrial safety, process engineer for the processing of building materials , specialist in sustainable development . Qualification directory of positions of managers, specialists and other employees, approved by order of the Minister of Labor and Social Protection of the Population of the Republic of Kazakhstan dated May 21, 2012 No. 201-ө-m.
Sphere of professional activity	The area of professional activity of the bachelor in the EP "6B11088(3) - Safety management and steady development" is the production, management, research, technological and environmental monitoring service, quality control of the working environment and

	human health safety.
Objects of professional activity	Objects of professional activity of graduatesaccording to EP"6B11088(3) - Safety management and steady development" are: - state institutions and public organizations; - production and intermediary enterprises, small and medium-sized businesses ; - transport, construction, warehousing and communications .
Subjects of professional activity	The subjects of professional activity of a bachelor in EP"6B11088(3)- Safety management and steady development" are : - planning and implementation of technosphere safety in state and non-state organizations ; – techno- ecological monitoring and marketing; – analysis, inspection and control of the state of the production environment; – compilation of prognostic models based on the collection and processing of initial data and the implementation of forecasting ; – management and consulting functions in the field of industrial safety and sustainable development ; – the process of creating regulatory and organizational documentation in the field of environmental management, industrial safety and sustainable development , taking measures to protect public health and the environment from negative impacts, environmental management, production technology; – techno- ecological research .
Types of professional activity	Bachelor in EP "6B11088(3) - Safety management and steady development" can perform the followingtypes of professional activity: - organizational and managerial; - production and technological; - service and operational ; - experimental research; - settlement and design ; -consulting .
Learning Outcomes	**LO 1-** Communicate freely in a professional environment and society in Kazakh, Russian and English, taking into account the principles of academic honesty and the culture of academic writing;
	LO 2 - Demonstrate socio-cultural, professional developmentbased on the formation of ideological, civil, spiritual and social responsibility, methods ofscientific and experimental research;
	LO 3 Possess information and computational literacy, use professional programs in professional activities;
	LO 4 Apply the theoretical foundationsengineering systems, networks and equipment ,their structure and principles of operation , typical schemes and designs of elements , rules of operation and safety in their professional activities;
	LO 5 Assess technological and environmental safety based on monitoring, auditing, examination and analysis of data on the current state of the production environment;
	LO 6 Propose solutions for the creationresource saving, low-waste and non-waste technologies, improvement of the state of the environment based on the results of research in the field of sustainable development;

	LO7 Undertake safety and sustainability risk management activities, offering practical recommendations to organisations on safety management of production using AI to optimise performance in reducing the environmental burden of energy, heat, gas, water, waste management, resource conservation and technical regulation;
	LO 8 Develop competent solutions in various professional situations based on critical analysis ,in accordance with the legislative, regulatory and legal framework in the field of industrial safety - andenvironmental regulation;
	LO 9 Possess the skills of resource-saving management, audit and assessment of production risks;
	LO 10 Organise accident prevention activities using the regulatory framework of industrial toxicology, expertise, auditing and safety management using neural network models for prediction;
	LO 11 Demonstrate how to recycle construction waste and treat wastewater to solve environmental problems;
	LO12 Perform work on the assessment of occupational risks, environmental impact and develop documentation and methodological materials, proposals and measures to improve working conditions and reduce anthropogenic impact on the environment;
	LO13 Work effectively individually and in teams ,using research, entrepreneurial and leadershipskills in conditions of uncertainty in the field of sustainable development.

3. Competencies of a graduate of the EP

GENERAL COMPETENCIES (SOFTSKILLS). Behavioral skills and personal qualities	
GC 1. Competence in managing one's literacy	OK1.1.Abilityself-learning, self-development and constantupdatetheirknowledge withinselectedtrajectory and under conditionsinterdisciplinarity. OK1.2. Abilityto expressthoughts, feelings, facts and opinions in professionalsphere. OK1.3. With the ability tomobility in modernworld andcriticalthinking .
GC 2. Language competence	OK2.1. Abilityline upprogramscommunicationsonstate, Russian and foreignlanguages.
GC 3. Mathematical competence and competence in the field of science	OK3.1. Ability and willingnessapplyeducationalpotential, experience and personalqualities acquiredintimestudymathematical, natural science, technicaldisciplines at the university ,forsolutionsprofessionaltasks .
GC 4. Digital competence, technological literacy	OK4.1. Ability to demonstrate and develop information literacy throughmastery and usecontemporaryinformation and communicationtechnologiesinallareashislife and professional activity. OK4.2. The ability to confidently and critically use modern information and digital technologies for work, leisure and communication, mastering the skills of using, recovering, evaluating, storing, producing, presenting and exchanging information through a computer, communicating and participating in collaborative networks using the Internet in the field of professional activity .
GC 5. Personal, social and educational competencies	OK5.1 The ability to physical self-improvement and orientation to a healthy life to ensure full-fledged social and professional activity through the methods and means of physical culture. OK5.2. Ability to social and cultural development on the basis of citizenship and morality. OK5.3.The ability to build a personal lifelong educational trajectory for self-development, career growth and professional success. OK5.4 The ability to interact successfully in a variety of socio-cultural contexts at school, at work, at home, and at leisure. OK5.5 Ability to engage in interpersonal social and professional communication in the context of intercultural communication and inclusion.
GC 6. Entrepreneurialcompetence	OK6.1. Abilityexercisecreativity andentrepreneurial spirit in variousenvironment. OK 6.2. Abilitywork in modeuncertainty and fastshiftsconditionstasks, takedecisions, distributeresources and managetheirtime . OK 6.3. Abilitywork with requestsconsumer.
GC 7. Cultural awareness and self-expression	OK7.1. Abilityto show ideological , civil and moralpositions . OK7.2. Abilitybetolerant of traditions and cultureotherspeoplespeace, possesshighspiritualqualities .
PROFESSIONAL COMPETENCES (HARDSKILLS).	
The oretical knowledge and practical skills specific to this	PC1 - the ability to apply monitoring methods, analyze situations in the field of various industries, demonstrate creativity and initiative

field	in management processes, including training others in order to improve teamwork .The ability to identify dangerous and harmful factors and ensure production safety.
	PC 2 - with the ability to assess the environmental impact of industrial emissions from enterprises in the region and report the results to the public . Ability to use state and international standards in the field of ecology.
	PC 3 - the ability to classify and evaluate the natural resources of the world and the republic and propose methods for their rational use using AI; the ability to collectively solve problems related to environmental issues when using biological and raw material resources.

3. 1 Matrix of correlation of the learning outcomes of the educational program as a whole with the competences formed

	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9	LO 10	LO 1 1	LO 12	LO 13
GC 1	+	+	+	+	+	+	+	+	+	+	+	+	+
GC 2	+	+	+	+	+	+	+	+	+	+	+	+	+
GC 3	+	+	+	+	+	+	+	+	+	+	+	+	+
GC 4	+	+	+	+	+	+	+	+	+	+	+	+	+
GC 5	+	+	+	+	+	+	+	+	+	+	+	+	+
GC 6	+	+	+	+	+	+	+	+	+	+	+	+	+
GC 7	+	+	+	+	+	+	+	+	+	+	+	+	+
PC1	+	+	+	+	+	+	+	+	+	+	+	+	+
PC2	+	+	+	+	+	+	+	+	+	+	+	+	+
PC3	+	+	+	+	+	+	+	+	+	+	+	+	+

4. Matrix of the influence of modules and disciplines on the formation of learning outcomes and information on labor intensity

No.	Module name	cycle	component	Name of the discipline	Brief description of the discipline	Amount of credits	Formed learning outcomes (codes)												
							LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO 10	LO 11	LO 12	LO 13
1.	Fundumentals of the Public Sciences	GED	OC	History of Kazakhstan	*Purpose:* The purpose of the discipline isformation of an objective idea of the history of Kazakhstan based on a deep understanding and scientific analysis of the main stages, patterns and originality of the historical development of Kazakhstan. *Contents:* Ancient people and the formation of nomadic civilization. Turkic civilization and the great steppe. Kazakh Khanate. Kazakhstan in the era of modern times. Kazakhstan as part of the Soviet administrative-command system. Declaration of Independence of Kazakhstan. State system, socio-political development, foreign policy and international relations of the Republic of Kazakhstan. Methods and techniques of historical description for the analysis of the causes and consequences of events in the history of Kazakhstan.	5	V	V												
2.			OC	Philosophy	*Purpose:* The formation of a holistic idea among students about philosophy as a special form of knowledge of the world, about its main sections, problems and methods of studying them in the context of future professional activity. And also the	5	V	V												

					formation of philosophical reflection, introspection and moral self-regulation among students. *Contents:* Emergence of a culture of thinking. Subject and method of philosophy. Fundamentals of philosophical understanding of the world: questions of consciousness, spirit and language. Being. Ontology and metaphysics. Cognition and creativity. Education, science, technology and technology. Human philosophy and the world of values. Ethics. Philosophy of values. The subject of aesthetics as a field of philosophical knowledge. Philosophy of freedom. Philosophy of art. Society and culture. Philosophy of history. Philosophy of religion. "Mangilik El" and "Modernization of Public Consciousness" are a new Kazakhstan philosophy.														
3.	Socio-Political knowledges	GED	OC	Social and Political Science	*Purpose:* The goal of forming knowledge about social and political activities, explaining social and political processes and phenomena. *Contents:* Consideration of the system of socio-ethical values of the society. Ways to use social, political, cultural, psychological institutions, features of youth policy in the modernization of Kazakhstani society and solve conflict situations in society and professional environment based on them.To study the methods of analysis and interpretation of political institutions and processes, ideas about politics, power, state and civil society, to understand and use the methods and methods of sociological, comparative analysis, to understand the	4	V	V												

					meaning and content of the political situation in the modern world. Analysis and classification of the main political institutions. Socialization, identity and deviant behavior: the role of an inclusive approach.														
4.		GED	OC	Cultural Studies and Psychology	*Purpose:* the formation of scientific knowledge of history, modern trends, current problems and methods for the development of culture and psychology, the skills of a systematic analysis of psychological phenomena. *Contents:* Morphology, language, semiotics, anatomy of culture. Culture of nomads, proto-Turks, Turks. Medieval culture of Central Asia. Kazakh culture at the turn of the XVIII - XIX centuries, XX century. Cultural policy of Kazakhstan. State Program "Cultural Heritage". National consciousness, motivation. Emotions, intellect. The will of man, the psychology of self-regulation. Individual typological features. Values, interests, norms are the spiritual basis. The meaning of life, professional self-determination, health. Communication of the individual and groups. Socio-psychological conflict. Models of behavior in conflict. Social and psychological foundations and development of an inclusive culture in modern society. Psychological characteristics and conditions for professional adaptation of individuals with special needs. Psychological support and tolerance as a way of social integration of people with special needs. Social and	4	V	V												

					psychological barriers to interaction of people with special needs in modern society..Include in the content of the discipline "Ecosystem and Law" the topic Inclusion - a strategy of international legislation.														
5.	Socio-ethnic Development	GED	EC	Ecosystem and law	*Purpose:* Formation of integrated knowledge in the field of economics, law, ecology and life safety, research methods to achieve sustainable development of society. *Contents*: Fundamentals of safe interaction between man and nature, productivity of ecosystems and the biosphere. Improving the competitiveness of entrepreneurial activity of society, business and the national economy in conditions of limited resources within the framework of sustainable development goals of Kazakhstan. Systemic understanding of environmental issues and principles of sustainable development. Knowledge and observance of Kazakhstan's rights, duties and guarantees of subjects, state regulation public relations to ensure social progress. Inclusion is a strategy of international law. Legal foundations of artificial intelligence.	5		V										
6.		GED	EC	Entrepreneurship and financial literacy	*Purpose:* Training skills in entrepreneurial activity organization, in managing personal and family financial resources, which are key to achieving financial well-being. *Content:* Entrepreneurship: essence, contents and conditions of formation. Legal forms of entrepreneurship. Risks in entrepreneurship. Business planning in entrepreneurship. Organization of	5		V										

					entrepreneurial transactions. Culture and ethics of entrepreneurship. Financing of entrepreneurial activity. The concept, goals and objectives of financial literacy. Money, settlements, and payments. Personal finance: income, expenses, budget. Taxes and taxation of individuals. Pensions and insurance. Banking services for the population. Bankruptcy of individuals and financial risks. Pyramid scheme and personal financial security.														
7.		BD	EC	Abay Study	*Purpose*: based on the creativity of A.Kunanbayev, the preservation of the «national code» and in the project «Kazakhtanu» *Contents:* historical overview of the history of Kazakhstan and Kazakh literature of the XIX-XX centuries. Studies of Abai's legacy of the XX-XXI century. Chronology of Abai's creativity. Abai is a great poet, ethnographer, founder of Kazakh written literature. Abai is the compiler of the code of laws «The Position of Karamola», social significance. Abai is a thinker, religious scholar, philosopher. The role of Abai in education and science, the concept of a «Holistic person». «Words of Edification»by Abai, an epic novel by M.Auyezova «The Way of Abai» . K. Tokayev «Abai and Kazakhstan in the XXI century», role, significance.	3	V	V											
8.				Basics of Financial Literacy	*Purpose:* to form students' knowledge system in the field of economics and finance for making informed decisions in various areas of life. *Content:* Financial literacy: concepts and		V	V											

					role in shaping economic behavior. Personal budget: accounting for income and expenses. Debts and loans: opportunities and risks. Personal savings: how to save and multiply. Taxes and taxation of individuals. Insurance of individuals. Personal financial security.																
9.				Foundations of Anticorruption Culture	*Purpose:* formation of an anti-corruption worldview, strong moral foundations of a personality, civic position, stable skills of anti-corruption behavior. *Content:* Overcoming legal nihilism, formation of the basics of students' legal culture in the field of anti-corruption legislation. Formation of a conscious perception/attitude towards corruption.Moral rejection of corrupt behaviour, corrupt morality and ethics.Development of skills necessary to fight corruption.Development of anti-corruption standards of conduct. Anticorruption propaganda, dissemination of lawfulness and respect for the law. Activities aimed at understanding the nature of corruption, awareness of social damage caused by its manifestation, ability to defend one's position with arguments, seeking ways to overcome manifestation of corruption.		V	V												
10.				Mukhtar Study	*Purpose*: Formation of a historical, literary idea of M. Auezov's work in the context of literary history, patriotism and cultural and spiritual position. Development of artistic thinking, skills of independent research activity. *Contents:* The life and creative path of M.		V	V												

					Auezov Semipalatinsk, Tashkent, St. Petersburg periods. M. Auezov's activity in the magazines «Sholpan», «Abai». M. Auezov's journalism. An artistic review of the short stories "Korgansyzdyn kuni", "Kyr suretteri", "Okagan azamat", "Kokserek", the play Enlik-Kebek and the stories "Kili Zaman", "Karash-Karash" okigasy", the monograph "Abai Kunanbayev", the epic novel "Abai Zholy".														
11.				Basics of Artificial Intelligence	*Purpose:* To develop competencies in the use of knowledge and practical application of artificial intelligence tools and methods, in alignment with the priorities of the AI-Sana program. *Contents:* Introduction to Artificial Intelligence (AI). Development of practical skills and abilities, including: using AI tools; working with large language models (LLMs); utilizing no-code AI platforms; employing generative AI tools; image recognition; natural language processing (NLP); and data visualization through AI. Understanding the application of AI in various fields and exploring its potential through the integration of AI-Sana program approaches.		V	V											
12.	Communication and Physical Training	GED	OC	Kazakh (Russian) language	*Purpose:* formation of communicative competence using the Kazakh (Russian) language in the socio-cultural, professional and public life, improvement of the ability to write academic texts. *Content:* Levels A1, A2, B1, B2-1, B2-2 (B2, C1 Russian language) are presented in the form of cognitive-linguocultural	10	V												

					complexes, consisting of spheres, themes, sub-themes and typical situations of communication of the international standard: social, social - cultural, educational and professional, modeled by forms: oral and written communication, written speech works, listening. Demonstration of understanding of the language material in the texts on the educational program, knowledge of terminology and development of critical thinking.														
13.		GED	OC	Foreign language	*Purpose:* a formation of students' intercultural and communicative competence in the process of foreign language education at a sufficient level A2 and a level of basic sufficiency B1. Student reaches B2level of common European competence if the language level at the start is higher than B1level of common European competence *Content:* Levels A1, A2, B1, B2 are presented in the form of cognitive-linguocultural complexes, consisting of spheres, themes, sub-themes and typical situations of international standard'scommunication: social, social - cultural, educational and professional, modeled by forms: oral and written communication, written speech works, listening. Demonstration of language material's understanding in texts on educational program, knowledge of terminology and critical thinking development.	10	V												
14.		GED	OC	Physical	*Purpose:* the formation of social and	8		V											

				Training/	personal competencies and the ability to purposefully use the means and methods of physical culture that ensure the preservation and strengthening of health in preparation for professional activity; to the persistent transfer of physical exertion, neuropsychic stresses and adverse factors in future work. *Content:* Implementation of physical culture and health and training programs. A complex of general development and special exercises. Sports (gymnastics, sports and outdoor games, athletics, etc.). Control and self-control during classes, insurance and self-insurance. Refereeing competitions, Means of professionally applied physical training. Modern health-improving systems: the breathing system according to A. Strelnikova, K. Buteyko, K. Dinaiki, joint gymnastics according to Bubnovsky.														
15.		BD	HSC	Professiona l Kazakh (Russian) Language	*Purpose:* to provide professionally oriented language training of a specialist who is able to competently construct communication in professionally significant situations and speak the language norms for special purposes. *Content:* Professional language and its components. Professional terminology as the main feature of scientific style. Scientific vocabulary and scientific constructions in educational-professional and scientific-professional spheres. Algorithm of work on the analysis and production of scientific texts on specialty. Producing scientific and professional texts.	3													

					Basics of business communication and documentation within the framework of future professional activity.														
16.		BD	HSC	Professionally Oriented Foreign Language	*Purpose:* Considers practical, lexical, grammatical and phonetic structure of the studied foreign language, reading and understanding of authentic texts in ecology, methods of term formation. *Contents:* Analyzes foreign literature, Internet sites on the state of the environment, dynamics of environmental processes, teaches competently transmit in a foreign language and correctly compile information in accordance with the goals and tasks of training, transmit texts in the specialty in writing.	3													
17.		GED	OC	Information and Communication Technologies	*Purpose:* formation of the ability to critically evaluate and analyze processes, methods of searching, storing and processing information, methods of collecting and transmitting information through digital technologies. Development of new "digital" thinking, acquisition of knowledge and skills in the use of modern information and communication technologies in various activities *Contents:* Introduction and architecture of computer systems. Software. Operating systems. Human-computer interaction. Database systems. Data analysis. Data management. Networks and Telecommunications.Cybersecurity. Internet technologies. Cloud and Mobile technologies. Multimedia technologies. Smart technology. E-technologies. Electronic business. Electronic	5													

					government.														
18.	Engineering and Technical Science	BD	EC	Mathematics	*Purpose:* formation of a system of basic ideas, skills and abilities in the field of higher mathematics, methods and techniques for its use in various natural sciences, social and humanitarian applications. *Contents:* Elements of linear algebra and analytic geometry, differential and integral calculus of functions of one variable. Fundamentals of mathematical analysis. Integration methods. Derivative of a complex function.	5														
19.		BD	EC	Physics	*Purpose:* development of knowledge of the laws of physics and improvement of the skills of their application in engineering and technology. *Contents:* Mechanical motion, basic laws of dynamics. Rotation of a rigid body, conservation laws.Continuous media mechanics, mechanical vibrations and waves.Molecular-kinetic theory, transfer phenomena, the rmodynamics. Electrostatics, direct electric current.Magnetic field, electromagnetic induction.Electromagnetic vibrations and waves, optics. Thermal radiation, photoelectric effect. Methods of processing and analysis of laboratory research results. Application of knowledge of physical laws to solve applied industry problems.	5														
20.		BD	EC	Engineering computer graphics	*Purpose:* To the formation of knowledge necessary for the execution and reading of technical drawings, the execution of sketches of parts, using software and hardware of computer graphics.	4														

					Contents: The main provisions of engineering graphics, skills in working with modern computer programs in the AutoCAD computer-aided design environment, 3D modeling.ICT standards. The link between ICT and the achievement of the Millennium development goals.														
21.		BD	EC	Standartization, Certification and Metrology	*Purpose:* To develop knowledge of standardization, certification and metrology in the field of nature protection. *Contents:* Use of legal norms governing the relations of entities in the implementation of standards. Current trends and requirements of standardization, certification and metrology systems to preserve environmental protection. Methods of analysis of experimental data processing, systematization of scientific and technical information.	4													
22.		BD	EC	Applied Mechanics	*Purpose:* to form professional competencies and stable ideas in the field of mechanics, necessary for the development and operation of technical products and elements of technological equipment. *Contents:* Theoretical mechanics. Basic concepts and axioms of statics. Forces and moment of force. Equilibrium equations for an arbitrary melancholy system of forces. Center of gravity. Kinematics of a point and a rigid body. Point dynamics. Dynamics of translational and rotational motion of a rigid body. Fundamentals of modeling the mechanical behavior of materials and structures. External and internal forces, stressed state of a physical	4													

					point. Mechanical characteristics of materials. Geometric characteristics of plane sections. Fundamentals of designing mechanisms, components and parts of machines. Quality assurance at the stages of design and construction of products. Engineering calculations in the design of products. Stretching and compression. Torsion. bend. Improving the quality characteristics of machines at the stages of calculation and design, metal consumption and compactness, uniform strength, reduced fatigue, unification of elements.														
23.		BD	EC	Organization of Production and Management/	*Purpose:* Formation of knowledge about entrepreneurial activity of enterprises and management. *Contents:* Public production, types of economic systems and patterns of transition economies in the field of environmental protection. The essence and mechanism of the functioning of a market economy, the foundations of the theory of supply and demand, the essence of capital, the round-robin and capital turnover.	4													
24.		BD	EC	Engineering Economics	*Purpose:* development of economic thinking and practical skills in performing engineering and economic calculations based on the study of the economic mechanism of the enterprise functioning in market conditions. *Contents:* Engineering economics, the purpose and objectives of the course. The main features, tasks and functions of the enterprise. The fixed and working capital of the enterprise. The staff of the enterprise. Labor payment at the enterprise.	4													

					Investment and innovation activity of the enterprise. Planning of the production activity of the enterprise. Marketing activity of the enterprise. Production costs and prime cost. Profit and profitability. Economic efficiency of the enterprise's activity.														
25.	Introduction to Specialty	BD	HSC	Introduction to Specialty	*Purpose:* To form the student's competence in the development, implementation, maintenance and improvement of programs, projects and individual measures to ensure safety at technosphere facilities. *Contents:* Modern management systems at the enterprise. Communication between various aspects of management. The structure of the management system. Deming cycle. The cost of implementing and maintaining modern management systems. The concept and aspects of security and risk in modern management. Classification of hazard sources. External and internal sources of danger. Planning and implementation of the enterprise's activities, taking into account the dangers and risks. Causes, development scenarios and consequences of the most famous man-made incidents, accidents and disasters. Comprehensive assessment of damage from incidents at technosphere facilities for the economy, society and the environment. ISO 31000 series of standards. Methods for identifying risks. Risk assessment - criteria, methods. Approaches to the analysis and assessment of environmental risks	4													

26.				Fundamentals of Academic Writing	*Purpose:* formation of thought and study of styles of presentation of scientific works, oratory, communicative orientations with assimilation and processing of information. *Contents:* The main genres of academic writing (abstract, review, analytical review, scientific report), the concept of a scientific database: the rules for compiling a search query, keyword search, search through Amazon catalogs, domestic and foreign scientific publishers. The main goals of analytical processing of texts.	4													
27.		BD	EC	Ecology and Sustainable Development	*Purpose:* formation of an ecological worldview, obtaining deep systemic knowledge and ideas about the foundations of sustainable development of society and nature, theoretical and practical knowledge on modern approaches to the rational use of natural resources and environmental protection. *Contents:* Ecology and problems of modern civilization. Autoecology is the ecology of organisms. Demecology – ecology of populations. Synecology is the ecology of communities. The biosphere and its stability. Evolution of the biosphere. The concept of living matter. Modern biosphere. Global biogeochemical cycles. Ecological crisis and problems of modern civilization. Strategies, goals and principles of sustainable development. Ecoenergy. Global energy-ecological strategy for sustainable development of the XXI century. Water is a strategic resource of the XXI century. Renewable energy	3													

					sources. Environmental policy of the Republic of Kazakhstan. The concept of sustainable development of the Republic of Kazakhstan.														
28.		BD	EC	Climate Change and "Green Economy"	*Purpose:* To form students' understanding of the close relationship between economic activity and climate change, the introduction of a "green" economy. *Contents:* Climate change and its impact on natural and economic systems, regulatory documents on climate change and the history of the formation of the concept of sustainable development and green economy in Kazakhstan, the main directions of the concept of the transition of the Republic of Kazakhstan to a green economy.	3													
29.	Maintenance of Systems and Structures	BD	EC	Fundamentals of Hydraulics and Hydrodynamics	*Purpose:* to familiarize students with the basic concepts, laws and equations of hydraulics, hydrostatics, gas dynamics and mastering the practical skills of hydraulic calculations. *Contents:* Introduction. The main characteristics of a continuous medium. Fundamentals of hydrostatics. General concepts of kinematics and fluid dynamics. Application of the main theorems of continuum mechanics. Fluid flow in pipes. Hydraulic calculations of pipelines with local resistances. The flow of liquid through holes and nozzles. Bernoulli integral for unsteady fluid motion. Hydraulic calculations of pressure pipelines.	4													
30.		BD	EC	Gas Supply Technology	*Purpose:* formation of knowledge and skills in calculation, design, technical and	5													

					economic comparison, selection of equipment, commissioning and operation of gas supply systems for residential areas, including residential, public, industrial and agricultural buildings . *Contents:* Introduction .Combustible gases, production and transport of natural gas, composition and properties of gaseous fuels. Urban gas supply systems and their main characteristics. Gas consumption. Hydraulic calculation of gas networks. Pressure regulators and gas control points. Reliability of gas distribution systems. Technical and economic calculations of gas supply systems. Theoretical foundations of gas combustion. Gas burners, their classification, the main characteristics of the calculation basis. Systems for supplying consumers with liquefied hydrocarbon gases. Household gas appliances. Organization of operation of gas supply systems.															
31.		BD	EC	Heat engineering	*Purpose:* formation of a complex of knowledge in the field of obtaining, converting, transferring and using heat, the formation of skills and abilities of thermodynamic research of working processes in heat exchangers, heat power plants and other heat engineering devices used in the industry. *Contents:* Basic concepts and definitions of thermodynamics. . The first law of thermodynamics and its application to the analysis of polytropic processes. Cyclic processes. The second law of thermodynamics. Thermodynamic analysis	4													

					of heat engineering devices. Mechanisms of heat transfer, thermal conductivity. convective heat transfer. Heat transfer by radiation. Heat and mass transfer devices. . Energy resources, energy saving. Heat generating devices .														
32.		BD	EC	Electrical Engineering and Power Supply	*Purpose:* the formation of knowledge in the field of theory, calculation and analysis of electrical and magnetic circuits, considered as models of real electrical devices used in the construction industries. *Contents:* Linear DC electrical circuits. Electric circuits of alternating single-phase current. Three-phase linear electric circuits of alternating current. Electrical measurements and instruments. Electrical transformers. Electric cars. Electric drive in construction and its classification. Electrical equipment and power supply.	4													
33.		BD	EC	Pumps, Fans and Compressors	*Purpose:* students mastering the issues of the theory of operation and practice of using superchargers, methods for their selection and rational operation at heat and gas supply, ventilation and air conditioning facilities (climatization facilities). *Contents:* Introduction. Brief historical overview. Basic terms and definitions. Classification and operation parameters of superchargers. Radial (centrifugal) superchargers. Axial superchargers. Volume blowers. Volume blowers. Other types of superchargers. General questions of supercharger application.	5													
34.		BD	HsC	Water Supply and Sanitation	*Purpose:* study of the basic concepts, methods, techniques and tools for designing and operating water supply and														

				System	sanitation systems. *Contents:* Systems and schemes of water supply of populated areas. Internal plumbing of buildings and structures. Internal sewerage of residential and public buildings. External sewer networks and structures. Determination of the estimated costs of water consumption and sanitation. Selection of flowmeters. Fundamentals of calculation of fire water supply. Implementation of an axonometric diagram of internal water supply networks. Implementation of an axonometric diagram of the internal networks of a fire-fighting water supply system. Fundamentals of hydraulic calculation of water supply systems. Calculation of the parameters of the operation of the pumping unit for the network. Determination of the capacity of water tanks. Calculation of the internal drainage system. Implementation of an axonometric diagram of internal sewerage networks. Implementation of the scheme of external sewerage networks. Fundamentals of calculation of external sewerage networks. Application of AI in water supply systems, Application of AI in wastewater and sewerage systems,														
35.		BD	EC	Engineering Systems, Nets and Equipments	*Purpose:* the formation of knowledge and practical skills in the field of engineering networks design, as well as the study of the processes and devices of heating, ventilation, air conditioning, water supply and sewerage systems, the development of automation, control, operation of engineering networks and equipment.	5														

					Contents: General classification of engineering networks. General rules for the placement of underground engineering networks. Water supply systems and their indicators. pipeline structures. Drainage networks of cities. Heat supply. Classification of heat supply systems. Thermal points. Network tracing. Gas supply systems. Network tracing and placement. Protection of the territory and structures from flooding. Causes of flooding and methods of protection. Classification of drains. horizontal drains. Radiation drains. Gallery drains. vertical drains. Combined drains. Drainage protection systems. Recommendations for the production of works in the construction of drainage. Intersection of the pipeline with roads and railways. Role of AI in engineering systems, networks and equipment, Smart Grids and Energy Efficiency (Smart Grid / Smart Building)														
36.		BD	EC	Engineering Systems, Networks of Cities and Towns	*Purpose:* students are mastering the methods of design, calculation and operation and engineering systems of a network of cities and towns. *Contents:* Water supply systems. The general scheme of water supply, its main elements, their functions and purpose. Technology of water purification from surface and underground sources. Special processing methods. Schematic diagram of the preparation of drinking water. Modes of water consumption and operation of water supply systems. water consumption schedule. Determination of estimated	5														

					costs. Classification of water disposal systems. Basic schemes and composition of structures. Classification of water disposal systems. Basic schemes and composition of structures. Network device. Sewer wells. Pipe connection methods.														
37.		BD	EC	Operation of Systems, Networks and Facilities	*Purpose:* to develop students' theoretical and practical knowledge and skills in designing water supply networks, water supply systems for populated areas and industrial enterprises, the formation of knowledge, rules and skills for monitoring, starting up and operating elements of water supply and sanitation systems to ensure uninterrupted, reliable and economical operation of networks and structures. *Contents:* Organization of services for the operation of water supply and sewerage systems. Technical and economic characteristics of the water supply and drainage facilities. Organizational structure of production departments and their main tasks. Functions of administrative, engineering and technical and duty personnel. Organization of dispatching service, repair work. Composition of technical documentation.													
38.		BD	EC	Maintenance of Systems and Structures	*Purpose:* to carry out and organize the technical operation, maintenance and repair of construction and / or housing and communal services, to carry out technical supervision and examination of construction objects. *Contents:* Basic concepts. Tasks of technical operation of buildings, structures and urban areas. Reliability and	5														

					operational requirements for buildings, their structures and equipment. Regulatory framework. The main provisions of the system of technical operation of the housing stock. Types of maintenance work. Maintenance of engineering equipment. Physical and moral deterioration of buildings. Optimal building life. Performance requirements for structures. Factors determining the wear and aging of structures, and signs of their manifestation. Premature deterioration of buildings.														
39.				Industrial Practice I	The purpose of industrial practice I is to acquire primary practical experience in the field of safety and sustainable development management, as well as consolidation of theoretical knowledge obtained during the training. The internship is aimed at developing the skills of risk analysis, assessment of the organisation's sustainability, as well as participation in the development and implementation of measures to ensure safety and sustainable development at the enterprise.	4													
40.	Industrial ecology	PD	EC	Technology of Wastewater Treatment of Industrial Enterprises	*Purpose:* formation of a set of professional knowledge, skills and abilities in the student in the field of developing new processes and facilities for wastewater treatment, as well as improving existing systems and facilities, their efficient operation. *Contents:* Properties of wastewater. Sewage receivers and conditions for their release. Technology, equipment and facilities for mechanical wastewater	5													

					treatment. Technology and facilities for biological wastewater treatment. Special wastewater treatment and wastewater disinfection technology. Properties and technological indicators of sewage sludge. Technologies and equipment for the treatment of sewage sludge. Artificial intelligence in industrial wastewater treatment technology														
41.		PD	EC	Theoretical Foundations and Technology of Water Treatment	*Purpose:* To form the student's competence in the field of theory and technology of purification of water flows of various origins, focused on the use of modern technological solutions in the field of protection of water bodies and the implementation of modern water supply systems in energy-efficient technologies of the chemical industry. *Contents:* Classification of water impurities based on their physical and chemical characteristics. The theory of aggregative and sedimentation stability of disperse systems and its significance for the selection and optimization of mechanical cleaning methods. Theoretical foundations of mechanical wastewater treatment from dispersed impurities. Classification of methods and their evaluation. Theoretical foundations of water purification from soluble impurities of various chemical nature. Oxidation-reduction processes in the technology of neutralization of water flows. Electrochemical cleaning methods. Water treatment systems with activated sludge. Biofiltration in artificial and natural	5													

					conditions. Sewage sludge treatment systems. Sewage sludge disposal systems.														
42.		PD	EC	Technique of Environmental Protection	*Purpose:* Formation of knowledge about the main technical means of environmental protection. *Contents:* The main treatment facilities and equipment for waste treatment, methods of industrial wastewater treatment (mechanical, biochemical, chemical, physico-chemical). Classification of methods of purification of liquid, gaseous, solid waste. Calculation of pollution costs and concentrations, main treatment facilities.	5													
43.		PD	EC	Methods for Eliminating Accumulated Environmental Damage	*Purpose:* Formation of research, interpretive and creative skills of the method of designing modern technological systems that ensure efficient and environmentally friendly waste disposal. *Contents:* Classification of technological solutions for the rehabilitation of objects of accumulated harm. Works on recultivation and arrangement of disturbed lands. Examples of obtaining secondary products during the processing of accumulated waste (not biotechnologically). Biotechnological processing of accumulated organic waste.	5													
44.	Resource saving and sustainable development	BD	HsC	Construction Waste Recycling and Sustainability	*Purpose:* study of the concept of sustainable development of society, the relationship between industrial production and the environment, familiarization with the basics of the production of building materials and products using man-made waste, methods and technologies for processing man-made raw materials into	6													

					finished products. *Contents:* Basic environmental requirements for the components of the human environment. Global environmental problems. Modern concepts of the relationship between man, society and nature. Ecology and construction. Ways to solve environmental problems within the concept of "Sustainability and Development". The main provisions of the concept of sustainable development and the reasons for its occurrence. The main ways to solve environmental problems within the concept of "Sustainability and Development". Environmental issues of construction in the city. Environmental requirements for the organization of construction in the city. Types of raw materials for the construction industry. Ecological passport.														
45.		BD	HsC	Recycling and Disposal of Waste From Enterprises	*Purpose:* formation of a complex of knowledge, skills and abilities in the field of technological support for the disposal and disposal of industrial and municipal solid waste, taking into account the requirements of environmental safety and the principles of economic efficiency. *Contents:* Methods for the disposal and disposal of industrial and municipal waste. Incineration of solid waste. Incineration of liquid waste. Above layer, bubbling and turbo bubbling combustion methods. Pyrolysis gasification of waste means of production and consumption. Plasma-chemical method of neutralization and disposal of waste. Methods for recycling	6													

					and neutralization of software: industrial solid waste (SW) and options for their disposal. Methods of disposal and disposal of MSW: municipal solid waste and options for their disposal.														
46.		PD	EC	Resource-Saving, Low-waste and Non-waste Technologies	*Purpose:* To form the student's competencies in the field of environmental protection and resource conservation, allowing them to apply knowledge, skills and personal qualities to minimize the impact of solid waste on the natural environment and humans. *Contents:* Introduction to the discipline. Shredding of solid waste. Grinding methods. Calculation of the average characteristic particle size. Grinding methods, choice of method. grinding cycles. Open and closed cycles. Chopper designs. Crushers, mills. Classification of solid waste. Multiple classification methods. Screening. Screen structures. Hydraulic classification and air separation, apparatus designs. Mixing solid waste. Mixing types. Mixer designs: drum, with rotating bladed working bodies, gravitational. Granulation of solid waste. Designs of granulators: drum, disc, roller. Waste compaction presses. Waste transportation. Storage and disposal of waste. Methods for the neutralization and elimination of waste. Data analysis, predictive algorithms and intelligent control.	5													
47.		PD	EC	Innovative Technologies in the	*Purpose:* formation of basic ecological thinking and worldview, providing an integrated approach to the analysis and	5													

				Field of Sustainable Development	solution of environmental problems of modern nature management and sustainable development of the "nature - economy - society" system . *Contents:* The concept of innovation and innovation. Functions and sources of eco-innovation. Methods for generating innovations. Financing and analysis of the effectiveness of innovation. Eco-efficiency analysis. Classification and characteristics of environmental innovations according to the duration of their payback: long-term, medium-term and short-term. Classification and characteristics of environmental innovations according to the depth of implementation: full, partial, conservation, utilization. Safety of ecological innovations. Classification and characteristics of ecological innovations in terms of safety for the environment: desirable, acceptable, unacceptable; according to the degree of security: green, yellow and red. AI models for climate modelling, AI-assisted satellite data analysis, AI-assisted agrobots.														
48.		BD	HsC	Industrial Practice I	*Purpose:* acquisition, consolidation, expansion and deepening of the theoretical knowledge gained in the field of security management , as well as research competencies in various fields and directions of modern management . *Contents:* Preparatory - a general meeting of students heading for practice, bringing the goals and objectives of work practice, issuing individual assignments and forms of reporting documentation. General - is to	5													

					get acquainted with the production or organization, the structure of the enterprise, the organization of the work of the labor protection and safety service in the industry and at this enterprise, to get acquainted with the regulatory, technical, regulatory and legal documentation on production safety planning. Analytical - consists in the analysis of the information received on the production practice in the organization, at the enterprise, as well as the preparation of a report on the practice. Final - preparation of a report on industrial practice and its defense by students														
49.	Maintenance and operation of systems and structures	PD	EC	Environmental Monitoring	*Purpose:* To form knowledge about environmental monitoring. *Contents:* The content and structure of environmental monitoring, environmental monitoring objects, classification of monitoring types by objetsandtrackingmethods. The essence, specific sandproperties of environmental monitoring. Modern method sandmeans of environmental monitoring.	5														
50.		PD	EC	Urban Ecohydrology	*Purpose:* Interaction between water and ecosystems. *Contents:* Ecological processes occurring within the hydrological cycle. Improving environmental sustainability. Principles of ecohydrology: hydrological, ecological, environmental engineering. Ecosystem degradationusing concepts combining terrestrial and aquaticeco systems	5														
51.		PD	EC	Fundamentals of Environme	*Purpose:* to familiarize students with the types of environmental activities, the system of norms and rules, regulatory	5														

				ntal Regulation and Examination	documentation on design, environmental management, rational use of natural resources, environmental safety, as well as environmental expertise, audit and EIA. *Contents:* Fundamentals of environmental regulation impact management on the OS. Environmental rationing. The main characteristics of environmental regulation of economic activity. The main characteristics of environmental regulation when exposed to various natural environments. Ecological rationing to preserve the sustainability of ecosystems. Normalization of the quality of air components. Normalization of the state of the aquatic environment and soil. Environmental impact assessment. Environmental Assessment (EE). State and public EE. Features of conducting EE in Kazakhstan and foreign countries. Environmental Audit (EA). Basic concepts and procedures. Features of conducting EA in foreign countries and in Kazakhstan. Rationing of environmental management in the Republic of Kazakhstan. Environmental certification. International standards. Rules and principles of ES and EA in the environmental marketing system.															
52.		PD	EC	Environmental Waste Inventory	*Purpose*: formation of knowledge about the norms of waste inventories, their properties and technologies of their processing. *Contents*: State cadastres of natural resources of the Republic of Kazakhstan, environmental cadastre of waste,	5														

					classification of natural cadastres. The main content of state cadastres and the basics of conducting cadastral work. Connection of cadastral work with environmental management and nature protection.														
53.		PD	EC	Industrial Safety Audit	*Purpose:* formation of knowledge on the organization and conduct of independent inspections to assess the state of security of enterprises and organizations aimed at ensuring labor safety in accordance with the standards *Contents:* Goals and objectives of the formation of undergraduates' knowledge on organizing and conducting independent audits to assess the state of security of enterprises and organizations, aimed at ensuring labor safety in accordance with the standards , safety audit at the enterprise. Legal and regulatory framework for auditing.Audit preparation and planning. systems of labor protection at the enterprise.Conducting an audit of the enterprise's labor protection management system. Keeping records.Analysis of audit results. Providing results.	5													
54.		PD	EC	Insurance of hazardous production facilities	*Purpose:* Formation of knowledge and development of skills in carrying out liability insurance of enterprises - sources of increased environmental hazard. *Contents:* Fundamentals of environmental insurance. Methodology of eco - insurance in Kazakhstan and abroad . Legal basis of insurance in the Republic of Kazakhstan and abroad. Actuarial calculations. Insurance premiums and insurance rates.	5													

					Methodological approaches to the calculation of tariff rates in environmental insurance. Assessment of the possibility of developing an emergency environmental situation.														
55.		PD	EC	Technical Systems Reliability and Technogenic Risk	*Purpose:* To form the competence of the student in the field of system analysis of technogenic risk and organization on the basis of this assessment of technical measures in the field of environmental and technosphere safety, to instill the skills of justification, organization and implementation of modern management systems of technogenic and occupational risk in enterprises and organizations. *Contents:* The main provisions of the risk theory. Features of environmental risk assessment. Risk assessment methods Environmental risk assessment system: Research-assessment –management. Organizational and methodological support of risk assessment. Methods of risk assessment. Analysis of processes in the risk assessment system. Environmental risk insurance as an additional mechanism for investment in environmental protection and territorial development. Legal bases of environmental insurance and ways of their development and implementation in the strategy and environmental policy until 2030. Biogeochemical factors and their impact on risk assessment. Technobiogeochemical zoning of territories. Potential, real and imaginary risks. Ranking of components according to the degree of environmental impact.	6													

					Ecological problems of urbanization. Risk management, the main provisions of the reliability management manual. Artificial Intelligence and Reliability of Technical Systems, Artificial Intelligence and Technological Risks, Applications of AI in Reliability and Risk Management.														
56.		PD	EC	Assessment of Production Risks at the Enterprise	*Purpose:* formation of knowledge on the identification and assessment of occupational risks in the workplace, reduction of occupational injuries and occupational diseases, to increase the level of protection of employees from occupational risks in the course of their work *Contents:* risk assessment and work plan for occupational safety, planning and preparation for risk assessment, organization of an assessment group, consideration of hazard factors, determination of the amount of risk, regulatory and legal documentation on the assessment of industrial risks at the enterprise, physical risk management measures, accident risk management measures, accident risk management measures, measures for the management of chemical risks, determination of the magnitude of risk .	6														
57.	Industrial Safety	BD	HSC	Labour protection	*Purpose:* formation of theoretical and practical knowledge on safety and labor protection issues to create healthy and safe working conditions at the workplace. *Content:* Legal and organizational issues of labor protection. Responsibility for violation of labor legislation, rules and	5														

					instructions on labor protection. Certification of production facilities according to working conditions. Meteorological conditions of the production environment. Industrial lighting. Production noise and vibration. Electrical safety. Fire safety in industrial enterprises. Organization of fire protection at enterprises. Equipment of fire-hazardous and explosive premises. Lightning protection of buildings and structures. The main fire-fighting measures. Organization of a paramilitary emergency rescue fire service.														
58.		BD	HSC	Life Safety	*Purpose:* to familiarize students with the basics of safe human interaction with the environment (industrial, household, urban) and the basics of protection from negative factors in dangerous and extremely dangerous situations. *Content:* Legislative acts in the field of life safety. The role, main tasks and organizational structure of the republican civil protection services.Dangers of the human habitat. Classification of emergency situations of various types. Basic principles and methods of protecting the population in emergency situations. The stability of the functioning of facilities in emergency situations. Rescue and other urgent work in the affected area.	4													
59.		PD	HSC	Technical regulation of the industrial safety	*Purpose:* to acquire knowledge and skills in the field of legal, economic, social and technical measures to prevent accidents and incidents. *Content:* Basic concepts. Legal, economic	4													

					and social bases for ensuring the safe operation of hazardous production facilities. The Law of the Republic of Kazakhstan "On Industrial Safety at hazardous production facilities". The state is regulated in the field of industrial safety. Technical regulation in the Republic of Kazakhstan. Registration of hazardous production facilities. Responsibilities of organizations in ensuring industrial safety. Licensed ie in the field of industrial safety. Production control over compliance with industrial safety requirements. The procedure for investigating the causes of accidents and accidents at facilities supervised by the Environmental, Technological and Nuclear Supervision Service. Compensation for damage caused as a result of an accident at facilities. Responsible for violating the requirements of the legislation in the field of industrial, environmental safety														
60.		PD	HSC	Bases of radiation safety	*Purpose:* to train students who are able to assess the real danger of natural and man-made radiation factors, understand the physical nature of this danger and minimize the real or possible radiation exposure. *Contents:* Ionizing radiation and man. Basic information about ionizing radiation. Sources of ionizing radiation and ways to weaken their influence. Characteristics of the radiation field and the main dose units. Interaction of ionizing radiation with matter. Basic principles of protection against ionizing radiation. Radiation safety	5														

					standards and basic sanitary rules.														
61.		PD	EC	Industrial Toxicology	*Purpose:* formation of knowledge about the toxicity of chemicals, their classification, their mechanisms of action on the environment. *Contents:* Fundamentals of toxicants in the environment. General information about the toxicity of substances .Physico-chemical properties of industrial poisons affecting toxicity.Classification of toxicants .Maximum permissible concentrations. Classification of harmful substances according to the degree of danger. Chemical disease .Poisoning. First aid for various poisonings .Toxic lesions of individual organs and systems of the body .The Toxicological Impact of Modern Manufacturing .	6													
62.		PD	EC	Basics of Chemical and Biological Safety	*Purpose:* formation of students' thinking on safety priorities in solving engineering problems; study of the main aspects of ensuring chemical and biological human safety in settlements and work areas. *Contents:* Fundamentals of chemical and biological safety. Analysis of technological processes in which harmful chemical and biological substances are formed or used. Analysis of natural sources of harmful chemical and biological substances. Recommendations, measures, methods and methods of neutralization of chemical and biological substances.	6													
63.		PD	HSC	Industrial Practice II/	*Purpose:* study of various technological processes at different phases of production, their features and operating conditions, organization and management of safety of	6													

					production processes. *Contents:* Consultation with the head of the practice on the collection, processing of the necessary material (literary and factual), on the preparation of the report. Occupational health and safety training. Acquaintance with the place of internship, studying the activities of the enterprise, equipment. Studying the structure and functions of the industrial safety service, labor protection at the enterprise. Study and analysis of documentation on industrial safety .Analysis of workplaces in terms of their sanitary and hygienic condition. Acquaintance with the technological process and working conditions in the organization. Participation in the training of employees. Analysis of the effectiveness of training workers in safe working methods. Fulfillment of an individual task.Preparing a practice report. Report formatting. Preparing to protect the report														
64.	Safety management and steady development	PD	EC	Resource Management	*Purpose:* formation of knowledge about rationing of resource saving, about the main directions of resource saving at the enterprises of the industry. *Content:* Resource conservation as a science. Communication with other disciplines. The need for resource conservation in the industry. The economic mechanism of resource conservation. Determining the amount of resources. Production capabilities. Interchangeability of resources. Alternative resources. The curve of production capabilities. The role	5														

					of natural resources in the reproductive process and economic zoning. Economic justification of raw material export volumes. Economic development and environmental factor. Production and natural resource potential. Externalities, assimilation potential of the environment and its economic assessment. The scheme of resource flows. Resource intensity indicator. Calculation of the general and particular indicators of resource intensity.														
65.		PD	EC	Management of the Circulation System of Secondary Resources in the Enterprise	*Purpose:* formation of knowledge on waste management strategies, on the components that determine the hazardous properties of waste, on the mechanisms underlying waste processing, on the impact of waste components on adjacent environments. *Contents:* Terms, definitions and classification of waste. Legal regulation in the field of waste management in the countries of the European Union. Classification catalog of waste. Legal regulation of activities in the field of waste management. General strategy in waste management. Organization of solid household waste collection system waste. The use of production and consumption waste as secondary resources. Biological bases of the composting process of organic waste fraction. Industrial composting technologies and the use of compost. Biological bases of anaerobic digestion of organic waste fraction. Industrial devices for anaerobic digestion of waste. Heat treatment of waste. Waste disposal at landfills.	5														

66.		PD	EC	Risk Management	*Purpose:* To form students' solid theoretical knowledge and practical skills in the field of industrial risk management. *Content:* Regulatory and legal framework for production risk management Organization of the production risk management system. Identification of risks. Risk analysis and assessment. Impact on risk. Software tools and information bases for identification of various types of risk. Assessment of the effectiveness of decision-making in the field of industrial risk management. Systems and man-made risk.	5													
67.		PD	EC	Strategic risk management system	*Purpose:* To provide fundamental and practical professional training of students in the field of theory and practice of risk management, as well as the development of methods for assessing the effectiveness of the risk management system *Content:* Prerequisites for the occurrence of risk. Uncertainty and threats. Evolution of hazards and improvement of protection technologies. Threats and dangers, their types. Risk and chance. The essence of risk. Risk and chance. Objects and subjects of risk. Risk functions. Classification of risks. Classification of risks by the sphere of occurrence. Classification of risks by period of existence. Economic risks and losses. Business risks as a special category of risks. Management and risk management. Evolution of the concept of "management". Historical development of risk management. Building a risk management	5													

					system. Risk management methodology. Risk analysis and assessment. Standards in risk. Risk analysis and assessment. Risk calculation methods. Risk assessment. Risk acceptability. Risk management methods. Classification of risk management methods.														
68.	Module of Final Certification	BD	HSC	Subjects on the additional educational program	Additional educational program (Minor) (minor) - a set of disciplines and (or) modules and other types of educational work, determined by students for study in order to form additional competencies .	12													
69.	Module of final Certification	PD	HsC	Predegree or Industrial Practice	*Purpose:* systematization, consolidation and expansion of theoretical knowledge gained over the entire period of study, collection of materials in accordance with the task for the final qualifying work, as well as the development of additional abilities for independent work in the professional and practical activities of the student. *Content:* Acquaintance with the goals, objectives, content and organizational conditions of the internship, obtaining an assignment for the internship. Briefing on the collection, processing of the necessary material (literary and factual), keeping a diary, compiling a report. Safety briefing at the enterprise. Acquaintance with the place of internship. General stage. Arrival at the enterprise, passing an introductory briefing on labor protection. Assignment to the place of internship, obtaining overalls (if provided), passing the primary briefing on labor protection at the workplace.	10													

					Analytical stage. Analysis of the information received, preparation of a practice report. The final stage. Getting FeeBDackcharacteristics from the head of practice of the organization. Registration, preparation and submission of the diary and report to the department, elimination of comments, preparation for the defense of the report. Preparation for the defense of the report on undergraduate practice. Handing over the practice.														
				Writing and Defending a Thesis, a Graduate work, or Preparing and Passing a Comprehensive Exam	The thesis is the last academic work of the student, which has a research character and sums up all the studies at the university. In the thesis, the graduate proves that he is familiar with bibliography, is able to independently find sources, conduct experiments, analyze results and summarize materials, has skills in studying literature and demonstrates the ability to correctly formulate and express his thoughts and conclusions.	8														
	Total on educational programme:					240													

5. Summary table reflecting the volume of credits mastered by modules of the educational program

of training	Semester	Amount	Amount of the studied disciplines	Amount of KZ credits	Total in hours	Amount of KZ credits	Amount

			Compulsory component	University component	Optional component	Theoretical training	Training practice	Minor program	Physical education	Industrial practice	Final attestation			exam	dif. pass
1	1	5	3	-	3	28	-		2	-	-	900	30	5	2
	2	4	3	-	3	27	1		2	-	-	900	30	5	3
2	3	4	3	2	2	28	-		2	-	-	900	30	6	2
	4	6	-	1	4	24	-		2	4	-	900	30	5	2
3	5	3	-	1	5	30	-		-	-	-	900	30	5	1
	6	4	-	1	2	12	-	12	-	6	-	900	30	3	1
4	7	3	-	-	4	21	-		-	-	-	630	20	4	-
	8	3	-		4	21	-		-	-	-	630	20	4	-
	9	1	-	-	-	-				10	8	540	20	-	1
Total			9	5	27	191	1	12	8	20	8	7200	240	37	12

6. Strategies, teaching methods and artificial intelligence, monitoring and assessment

Learning strategies	Student–centered learning: The student is the center of teaching/learning and an active participant in the learning and decision-making process. Practice-oriented training: orientation to the development of practical skills.
Teaching methods	Conducting lectures, seminars, various types of practices with: • the use of innovative technologies: • problem-based learning; • case study; • work in a group and creative groups; • discussions and dialogues, intellectual games, olympiads, quizzes; • reflection methods, projects, benchmarking; • Bloom's taxonomies; • presentations; • * rational and creative use of information sources: • * multimedia training programs; • * electronic textbooks; • * digital resources. • * machine learning methods Organization of independent work of students, individual consultations.
Monitoring and evaluation of the achievability of learning outcomes	Current control on each topic of the discipline, control of knowledge in classroom and extracurricular classes (according to syllabus). **Assessment forms:** • survey in the classroom; • testing on the topics of the discipline; • control works; • protection of independent creative works; • discussions; • trainings; • colloquiums; • essays, etc. **Boundary control** at least twice during one academic period within the framework of one academic discipline. Intermediate certification is carried out in accordance with the working curriculum, academic calendar. Forms of holding: • exam in the form of testing; • oral examination; • written exam; • combined exam; • project protection; • protection of practice reports. **Final state certification.**

7. Educational and resource support for EP

Information Resource Center	-The structure of the JRC has 6 subscriptions, 16 reading rooms, 2 electronic resource centers (ERC). The basis of the network infrastructure of the OIC consists of 180 computers with Internet access, 110 automated workstations, 6 interactive whiteboards, 2 video dvoiki, 1 videoconferencing system, 3 scanners of A-4, 3 format.??? IRBIS-64 OIC – AIBS software for MSWindows (a basic set of 6 modules), an autonomous server for uninterrupted operation in the IRBIS system. -The library fund is reflected in the electronic catalog available to users on the website http://lib.ukgu .kz is on-line 24 hours 7 days a week. -Thematic databases of its own generation have been created: "Almamater", "Works of scientists of SKSU", "Electronic Archive". Online access from any device 24/7 via an external link http://articles.ukgu.kz/ru/pps . -Work with catalogs in electronic form. The EC consists of 9 databases: "Books", "Articles", "Periodicals", "Works of the teaching staff of SKSU", "Rare books", "Electronic Fund", "SKSU in print", "Readers" of "SKU". -The JIC provides its users with 3 options for accessing its own electronic information resources: from the Electronic Catalog terminals in the catalog hall and divisions of the JIC; through the university's information network for faculties and departments; remotely on the library's website http://lib.ukgu.kz /. -Access to international and national resources is open: "SpringerLink", "Envoy", "Web of Science", "EVSSO", "Epigraph", to electronic versions of scientific journals in open access, "Zan", "RMEB", "Adebiet", Digital library "Akpigress", "Smart-kitar", "Kitar.kz", etc. -For people with special needs and disabilities, the library's website has been adapted to the work of visually impaired users in the JRC.
Material and technical base	Aerocon aerosol . Analyzer "Fluorate 02-3M". Laboratory Ionomer 0.001rH-150MI., Biomed microscope . Exhaust cabinet. 4pcs Tubular Oven SUOL. Distiller DE-10, Stereomicroscope X40 U X80 YJ-T101G, Set of laboratory bench installation (7 pieces), Digital microscope 2 pcs, Concentrator KN-3, Analytical scales 2 pcs. Calculation of dispersion of the UPRZA-"Ecologist" Software, Humidity analyzer, Table d / scales 2 pcs, Sterilization TP-20, Reagent cabinet, Island table, Table for appliances, Photocolorimeter KFC, Scales VLTE 150, Thermostat TS 1/80, Microscope studies, Gas analyzer PGA, Aspirator 822, Kom / t sieve d / soil, Scales MK, Distiller DEK, Electric chambers. Furnace, Elan CO Gas analyzer, Radiometer-dosimeter, Pneumatic tube.constr. NIIOGAZ 2 pcs, A set of hydrometers 2 pcs, Lab.furniture, Centrifuge, Pump RK t 60, Lockers met.1-door, Lockers met.6-door, 2-section file cabinet, Oxygen cylinder, Lab.cabinet for dishes, Lab.tables, Table for scales, color printer, Interactive whiteboard HJ-89 complete with mounting system projector, laptop 2 pcs, Interactive whiteboard included, Interactive whiteboard, Computer 2, Printer, Printer 3b1, MFP 3B 1-3 pcs, Computer 3 pcs, Computer 5 pcs, LASER printer 2018, Computer included 2 t, Computer, office (universal).

APPROVAL SHEET

on the Study program "6B11088(3) - Safety management and steady development"

Director of DAA	Naukenova A.S.
Director of DASc	Nazarbek U.B.

РЕЦЕНЗИЯ

на образовательную программу «6В11088(3)-Менеджмент безопасности и устойчивое развитие», разработанной в Южно-Казахстанском университете им. М.Ауезова, г. Шымкент

В настоящее время практически сформулирована философия безопасного производства, ориентированная на принципиальное сокращение существующих техногенных нагрузок на окружающую среду.

Стратегическая цель образовательной программы «6В11088(3)-Менеджмент безопасности и устойчивое развитие» направлена на подготовку специалистов способных понимать, излагать и критически анализировать базовую информацию в области экологии и природопользования, владеющих знаниями основ внутридомовых водопроводных и водоотводящих систем, отопительных оборудованиие, арматуры и сети отопления и горячего водоснабжения, системы вентиляции и кондиционирования.

Образовательная программа полностью отвечает требованиям по развитию и уровню подготовки студентов по междисциплинарному курсу профессионального модуля.

Объектами профессиональной деятельности выпускников по ОП «6В11088(3)-Менеджмент безопасности и устойчивое развитие» являются:

- государственные учреждения и общественные организации;
- производственные и посреднические предприятия, предприятия малого и среднего бизнеса;
- транспорт, строительство, складское хозяйство и коммуникации.

Программа направлена на удовлетворение потребностей государства, региона, работодателей и обучающихся, согласованы с национальными приоритетами развития и стратегией развития вуза, направлены на практическое применение знаний, на самосовершенствование и получение образования в течение всего цикла обучения по специальности менеджер по безопасности в различных отраслях народного хозяйства.

Выпускники по ОП «6В11088(3)-Менеджмент безопасности и устойчивое развитие» могут занимать должности: инженера по безопасности производсва, менеджера по стратегическому и операционному управлению безопасности производства, инженер-эксперт в сфере промышленной безопасности, инженер-технолог по переработке строительных материалов, специалист по устойчивому развитию. Квалификационного справочника должностей руководителей, специалистов и других служащих, утвержденного приказом министра труда и социальной защиты населения Республики Казахстан от 21 мая 2012 года № 201-ө-м.

Формирование профессиональной компетенции осуществляется благодаря содержанию, объему и логике построения индивидуальной траектории обучающихся. В качестве элективных курсов в учебном плане

предусмотрены модули «Техническое обслуживание и эксплуатация систем и сооружения», «Ресурсосбережения и устойчивого развития», «Промышленная безопасность и экологическое нормирование», «Экспертиза и аудит в безопасности производства», «Модуль менеджмент безопасности» направленные на применение инновационных технологий в учебном процессе и критического мышление.

Процесс формирования учебных планов прозрачны, к ним привлекаются обучающиеся и работодатели–представители профильных НИИ и предприятии (ТОО «Водные ресурсы маркетинг», ТОО КазНИИХимпроект, ТОО Энергоорталык-3), ППС активно развивает сотрудничество с профильными НИИ, принимает участие в различных семинарах, ведут совместные научные исследования, консультируется по вопросам содержания образовательных программ, что в конечном итоге приводит к эффективному трудоустройству выпускников.

Образовательная программа 6В11088(3)-Менеджмент безопасности и устойчивое развитие» может быть рекомендована для подготовки студентов по направлению «6В112- Гигиена и охрана труда на производстве» с присвоением квалификации «бакалавр в сфере услуг».

Менеджер по охране окружающей среды АО «3-Энергоорталык» М.Т.Бозшатаева

ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ

на образовательную программу
6В11088(3)-Менеджмент безопасности и устойчивое развитие
разработанной в Южно-Казахстанском университете
им. М.Ауезова, г. Шымкент

Стратегическая цель образовательной программы «6В11088(3)-Менеджмент безопасности и устойчивое развитие» направлена на подготовку специалистов способных понимать, излагать и критически анализировать базовую информацию в области экологии и природопользования, владеющих знаниями основ природопользования, экономики природопользования, устойчивого развития, оценки воздействия на окружающую среду, правовых основ природопользования и экологии.

К разработке образовательной программы привлечены представители организаций работодателей отрасли технического регулирования и эксплуатации инженерных конструкций.

Структура программы представлена в соответствии с требованиями к составлению программы: отражены паспорт образовательной программы; результаты обучения ОП, компетенции ОП, сводная таблица, отражающая объем освоенных кредитов в разрезе модулей образовательной программы, сведения о дисциплинах.

Цель образовательной программы бакалавриата соответствует 6 уровню Национальной рамки квалификаций Республики Казахстан, они также гармонизированы с Дублинскими дескрипторами, 1 циклом Квалификационной Рамки Европейского Пространства Высшего Образования, а также 6 уровнем Европейской квалификационной рамки для образования в течение всей жизни.

Образовательная программа направлена на подготовку специалистов в сфере услуг в соответствии с существующими требованиями нормативных документов в области высшего образования и включает циклы базовых и профессиональных дисциплин способствующих приобретению навыков владения специальной терминологии;

- использование современных методов исследования при выполнении исследовательской работы;
- изучение методов математической статистики, особенности инновационных технологий в области технического регулирования и эксплуатации инженерных конструкций направленных на подготовку специалистов, т.е менеджеров по безопасности в различных отраслях народного хозяйства;
- работы с технической и справочной литературой, научно-технической документацией и на приобретение обучающимися необходимых знаний, умений, навыков и компетенций.

В образовательной программе общая трудоемкость составляет 240 кредитов, из них: теоретическое обучение – 210 кредитов, производственная практика – 10 кредитов и итоговая аттестация - 20 кредитов.

В ОП представлены дисциплины ведущих Европейских Вузов, составленных на основе международных программ ECAP. Предметами профессиональной деятельности бакалавра по ОП «6В11088(3)-Менеджмент безопасности и устойчивое развитие» являются:

– планирование и осуществление техносферной безопасности в государственных и негосударственных организациях;

– техно-экологический мониторинг и маркетинг;

– анализ, инспекция и контроль состояния производственной среды;

– составление прогностических моделей, на основе сбора и обработки исходных данных и выполнение прогнозирования;

– управленческие и консалтинговые функции в сфере производственной безопасноси и усойчивого развития;

– процесс создания нормативно-организационной документации в области рационального природопользования, производственной безопасности и устойчивого развития, проведения мероприятий по защите здоровья населения и окружающей среды от негативных воздействий, рациональное природопользование, технология производства;

– техно-экологичесие исследования.

Объектами профессиональной деятельности выпускников по ОП «6В11088(3)-Менеджмент безопасности и устойчивое развитие» являются:

- государственные учреждения и общественные организации;

- производственные и посреднические предприятия, предприятия малого и среднего бизнеса;

- транспорт, строительство, складское хозяйство и коммуникации.

Образовательная программа ориентирована на результаты обучения, соответствующие требованиям профессиональных стандартов, потребностям отраслевых рынков труда и организаций работодателей.

Из выше изложенного, можно сделать вывод, что образовательная программа «6В11088(3)-Менеджмент безопасности и устойчивое развитие» отвечает предъявляемым требованиям и обеспечивает условия для формирования конкурентоспособности выпускников для максимально быстрого трудоустройства по специальности и профессионального роста.

Председатель экспертной комиссии: Дауренбек Н.М.

Члены экспертной комиссии: Абдуова А.А.

Алпамысова Г.Б.

Алтыбаев Ж.М.

Ермеков С.Р.