Sustainable development courses

№	**Course title** (Bachelor's Programs)	**Notes**
1	Ecological law of the Republic of Kazakhstan	Acquiring knowledge of environmental legislation and studying the mechanism of its implementation; mastering theoretical and practical skills in applying the norms of this legislation in life, fostering environmental and legal awareness, which is necessary in future work to ensure environmental law and order. The nature protection legislation of the Republic of Kazakhstan is analyzed, the natural resource legislation on the use and protection of lands, mineral resources, waters, flora and fauna, atmospheric air is being studied.
2	National Security Issues	Formation of the representation of the composition of forces and means to ensure national security, legislation and regulatory - legal framework. Ability to navigate sources and literature on modern problems of national security of the Republic of Kazakhstan and on disarmament topics, knowledge of basic documents and special scientific research on this topic. Develops skills to express and substantiate his position on the national security of Kazakhstan.
3	Ecological and economic assessment of the enterprise's activity	Studies methods of rational environmental management and environmental problems. Investigates approaches to assessment of natural and resource potential and indicators of efficiency of its use in region. Reveals spatial localization of resources. Defines efficiency of resource use, Gives a technique of assessment ecologic-economic components natural and resource capacity of Kazakhstan
4	Land and Ecological laws of the Republic of Kazakhstan	Acquiring knowledge of environmental legislation and studying the mechanism of its implementation; mastering theoretical and practical skills in applying the norms of this legislation in life, fostering environmental and legal awareness, which is necessary in future work to ensure environmental law and order. The nature protection legislation of the Republic of Kazakhstan is analyzed, the natural resource legislation on the use and protection of lands, mineral resources, waters, flora and fauna, atmospheric air is being studied.
5	Environmental Protection in Oil and Gas Industry	Know the legal and organizational issues of environmental protection. Have an understanding of the natural environment, its state and problems, estimates of the impact of the industrial environment of industrial enterprises on the environment. To be informed in the management of environmental activities in the Republic of Kazakhstan, the prospects for the implementation of environmental management systems based on ISO 14000 series.
6	Environmental Labeling	Knowledge and understanding of the nature and

		objectives of environmental labeling, the requirements of international standards for environmental labeling, the ability to analyze the types and forms of environmental information for product labeling, features of environmental labeling for various categories and types of products, skills of forming the necessary information for labeling, the choice of environmental signs, depending on the object of labeling.
7	Environmental Safety of Textile Production	Calculatation the maximum permissible concentration of contained harmful substances in the air in textile production. Study the process of cleaning and disposal of industrial waste. Consider modern methods of environmental certification of textile products and eco-labeling in the textile industry
8	Ecological Safety of Weaving Production	Description the current environmental problems of the textile industry. Substantiation measures to prevent harmful emissions and environmental pollution by improving technological processes. Calculation the proportion of dust on the process and the principle of the equipment. Substantiation waste water treatment methods: neutralization, oxidation, reduction and removal of heavy metal ions.
9	Safety of Processing Productions Products	Knowledge of the types of contaminants of raw materials and food products, safety standards. Increased knowledge of food safety and basic evaluation criteria. The ability to determine the dangers of foreign substances from the external environment, to carry out the classification, regulation, control of food additives. The use of mechanisms for regulating the quality and safety of food products. Knowledge allows independently collect and interpret information.
10	Safety and Examination of Food Products	Consideration of the danger of microbial and viral origin, parasites, toxins of natural origin. Characteristics of food additives, genetically modified objects, packaging materials, detergents and disinfectants. The study of the examination and development of methods for detecting falsification of food products, identification of types of products, improving the quality and forecasting when planning the composition and determining the quality indicators of products.
11	Quality and Safety of Livestock Products	Competence on the basic concepts of quality and safety of livestock products, the value of quality and safety indicators of livestock products; the quality and safety assessment of livestock products and their expertise; regulatory requirements and documentation for quality and safety; control system using modern achievements of science and advanced

		technology.
12	Safety Regulations and Environmental Protection in Agriculture	Study the modern state and the problem of mechanization of farm animals; be able to determine safety and environmental protection measures during the mechanization of the preparation and storage of feed, with machine watering of animals and when removing manure; Have the knowledge to use modern technologies and techniques to maintain an optimal microclimate in livestock buildings.
13	Environmental Problems of Electrochemical Productions	Considers a system of water use and wastewater treatment in electrochemical production, parts washing schemes, equipment used. Analyze the conditions for the discharge of wastewater into water bodies, the reagent and electrochemical method of wastewater treatment, the regeneration of precious and non-ferrous metals from spent galvanic solutions. Teaches to independently conduct calculations of rationing the flow rate of soluble and insoluble anodes, to evaluate the effectiveness of wastewater treatment.
14	Environmental Aspects of the Production and Application of Oil Refining Products	Considers methods of cleaning and disposal of hazardous emissions and waste from refineries, issues of the impact of power plants and vehicles on the environment, methods of reducing air and soil pollution during storage of petroleum products. Acquires skills in the development and implementation of environmentally friendly technological processes and modes of production of oil refined products and disposal of gaseous, liquid and solid waste.
15	Guard of environmentand renewable sources of electricity	Study the ecological foundations of environmental protection, the structure of the ecosystem, the laws of ecology and the classification of environmental factors, the classification of types of pollution by the nature of the action, by the scale, sustainability. Consider energy, its types, methods of transformation, transportation, the impact of renewable energy sources on the environment. Acquire skills of calculating the effects of air pollution.
16	Environmental technologies at thermal power plants	Considers the main ways and methods of protecting environmental components, the basics of legislation in the field of environmental protection. Form the skills of assessing the state of the environment and the degree of technogenic impact of production on its components. Acquire the skills of conducting a logical discussion on topics related to solving environmental problems.
17	Environmental chemistry	Considers the chemical foundations of the transformation of pollutants in the environment, an introduction to environmental chemistry, the

		chemical foundations of environmental interactions. Studies the ecological chemistry of the atmosphere, hydrosphere and lithosphere, ecological properties of chemical elements and their compounds.
18	Ecological Aspect of Natural Science	Considers the ecological aspects of biology, biosphere and ecosphere. Analyzes the chemistry of pollutants, chemical methods and environmental protection. Studies the physical types of pollution and energy flows in the biosphere. Discusses the global energy-ecological strategy for sustainable development of the XXI century. To independently determine the ecological aspects of natural science.
19	Ecology of animals and plants	Considers ecology of animals and plants, the problems of systematization of biodiversity, symbiotic relationships between organisms. Studies precellular life forms, characteristics and general properties of viruses. Explores the general system and diversity of living organisms, the comparative characteristics of prokaryotes and eukaryotes.
20	Geoecology	Considers changes in the Earth's geospheres under the influence of human activity and emerging geoecological problems, the place and connections of geoecology among the earth sciences. Explores the global ecological problems of the Earth, anthropogenic transformations of the Earth's ecosystems, the natural resources of Kazakhstan, its regional and national features. Analyzes the ecological consequences of mining, a decrease the natural biological productivity of ecosystems, maps of the danger of anthropogenic desertification of a part of the territory of Kazakhstan
21	Ecological biogeography	Considers biogeography and ecology in the system of geographical and biological sciences, the main stages of the development of biogeography and ecology. Knowledge the general distribution of organisms to the characterization of individual biogeographic units; explains the peculiarities of the distribution of the types of their stories, methods of mapping the areas of biological objects
22	Entrepreneurship in the Environmental Field	
23	The Economics of Natural Management	Study the most reasonable ways to rationalize environmental management and determine the economic efficiency of the implementation of environmental protection measures and assess the economic damage caused by the national economy to the environment. Reveals the economic mechanism of regulation of natural resources and environmental protection, features of the economic assessment of natural resources, ecological and economic aspects of the use and protection of renewable and non-renewable natural resources.
24	Ecological Resource Knowledge	Explores the intersectoral nature of environmental

		resource science. Explains the principles, methods and approaches for organizing technology for the economical use of non-renewable natural resources and the careful use of inexhaustible natural resources; Analyzes the ecological consequences of the distribution and structure of certain types of natural resources and their complexes; Assesses the impact of industrial waste on the environment;
25	Fundamentals of Ecological law in Management and Marketing	
26	Fundamentals of Industrial Ecology	Considers the resources of the natural system and their use, technogenic pollution of the natural environment. Researches the greening of technological processes and methods for choosing greening projects, optimization of the location of pollution sources, sanitary protection zones. Calculates the dispersion of pollutants from a single source, MPE and MPD standards.
27	Physical and Radiation Ecology	Examines the history of the development of radiation ecology and the basics of dosimetry, radioactivity, alpha and beta particles and gamma radiation. Study of the structure of the atom, neutron radiation and radioactive pollution, the principles of methods for protecting the atmosphere, hydrosphere and lithosphere from industrial pollution.
28	Technique of Environmental Protection	Considers the main treatment facilities and equipment for waste treatment, methods of industrial wastewater treatment (mechanical, biochemical, chemical, physical and chemical). Analyzes the classification of methods for cleaning liquid, gaseous, solid waste. Calculates costs and concentrations of pollution, main treatment facilities.
29	Environmental Biology	Considers the general patterns of functioning of ecological systems, mechanisms of formation and protection of the environment, the degree of influence of human activities on the laws of ecological biology; major global and local environmental problems at the present stage. Analysis of environmental problems. Comparison of ways to preserve and improve the state of the environment.
30	Ecological Problems of the RK	Characterizes the main environmental problems of the Republic of Kazakhstan: the current state of the atmosphere, hydrosphere, lithosphere, the impact of oil production and uranium on the environment, radiation situation; conservation of biodiversity in Kazakhstan. Analysis of the causes of these environmental problems. Application of modern methods of rational use of natural resources in solving problems, performing practical work
31	Ecology and Fundamentals of Life Safety	Studies the relationship of ecology with other sciences, the biosphere and its sustainability, the

		ecological crisis and the problems of modern civilization, green economy and sustainable development, the global energy-ecological strategy for sustainable development of the XXI century, the environmental policy of the Republic of Kazakhstan. Consider environmental problems in industry, the basics of safe human interaction with the environment (industrial, household, urban) and protection from negative factors.
32	Chemical Ecology	Knowledge of the basic concepts in chemical ecology: introduction to the theory of open systems, chemical basis of the conversion of pollutants in the environment, chemical protection of living organisms, chemical ecology of hydrosphere and energy hypotheses regarding antibiotic functions that they perform in the microorganisms-producers.
33	Environmentally Harmful Substances	Knowledge of the basic laws of the impact of harmful substances on living systems, methods for monitoring and analyzing the pollution of ecosystems with chemical substances, the toxicological properties of the most common chemicals and compounds, the ways of entry of ecotoxicants into ecosystems and the processes of their inclusion in the biogeochemical cycle, be able to use methods of monitoring and analyzing the state of ecosystems
34	Transport ecology	Examines the impact of transport, transport facilities and technologies on the environment. Develops the ability to assess the environmental safety of vehicles, road transport complex and motor transport enterprises. Forms skills for the development of measures to reduce the negative impact of transport on the ecosystem as a whole.
35	Student and research work of students	Consider the issues of the impact of road conditions on the safety of vehicles and pedestrians, the features of the road network and the natural and climatic conditions of different regions from the point of view of ensuring traffic safety. Forms the skills of ensuring traffic safety in the design of new, reconstruction, repair and maintenance of existing roads, the development of measures for organizing traffic in ensuring safety
36	Vehicles safety	Examines the practical application of the methodological foundations of traffic management, identification of hazardous areas in terms of traffic safety. Performs engineering calculations for the development and design of traffic management using technical means; organization of work of the installation and maintenance service and a set of operations to maintain the operability or serviceability of technical means when used for their intended purpose

37	Road conditions and traffic safety	Consider the issues of the main measures to ensure traffic safety on roads, airfields, traffic intensity and composition of vehicles on highways and improve its organization. The rationing of the suitability of transport facilities from the standpoint of ensuring traffic safety, the factors affecting the operation and condition of the road, determining the traffic conditions are stated. The road network and safety problems of transport systems are being studied.
38	State road safety managment	Considers the laws and regulations of traffic management, provides a classification of technical means, line-up and adjustment of technical means of regulation. Develops skills in the design of traffic light objects, the use of appropriate road signs and road markings in various traffic conditions.
39	Technical regulation of the industrial safety	Knowledge of the normative and methodological support of technical regulation is instilled: the system of state supervision, interdepartmental and departmental control of technical regulations: to apply the methods and principles of technical regulation in the development of standards and other regulatory documents; characterize the system of state supervision, interdepartmental and departmental control of technical regulations
40	The bases of radiation safety	Forms knowledge on recognizing methods of protection against ionizing radiation, methods of radiometric control and legal aspects of radiation safety; application of knowledge on carrying out calculations of protection against ionizing radiation, analysis of environmental objects from the point of view of their radiation safety; analyze in matters of radiation safety, organization of work of the radiation safety service, work with sources of ionizing radiation.
41	Safety vital functions	Acquire skills in modeling and forecasting the development of emergency situations, identify hazards; recognize and quantify the negative impacts of the habitat, conduct continuous control and monitoring of the habitat; to develop, plan and implement measures to improve the safety of life and eliminate the negative consequences of exposure to hazardous and harmful factors; plan and implement the measures on a safety improvement
42	Theoretical bases of environmental protection	Knowledge of the basic physical and chemical laws of cleaning aerosols, colloidal systems and waste water; basics of solid industrial waste disposal, assess the main parameters of physical and chemical processes of environmental protection, formation of judgments of the analysis from a scientific point of view of the phenomenon, the processes occurring during the purification of gas emissions in the

		atmosphere, wastewater in the hydrosphere and solid waste in the lithosphere are instilled
43	The main laws and processes of environmental protection	Promotes knowledge of design and production and technological activities for the design, installation and operation of water treatment systems, wastewater treatment and disinfection, the selection of main and auxiliary equipment for water supply and sewage treatment facilities, as well as the technical and economic comparison of various options and circuit solutions for natural and waste water treatment.
44	Legislative acts in the field of safety and labor protection	The discipline sanctifies the organizational and legal foundations of labor protection. Labor Code. Basic principles in the field of occupational safety and health. Guarantees of workers' rights to safety and labor protection. Organization of labor protection in production. Knowledge of the Law of the Republic of Kazakhstan "On Civil Protection"; apply the main legislative acts of the Republic of Kazakhstan in the field of life safety; provide assistance to victims of emergencies
45	Regional providing of the life safety in the Republic of Kazakhstan	know the main provisions of the Constitution of the Republic of Kazakhstan, legislative and regulatory acts in the field of labor and safety, the system of labor safety standards, regulatory and technical documents on hygiene in labor safety, industrial sanitation, fire safety, the rights and obligations of the employee and employer in the field of labor protection
46	Electrical safety	Instills an understanding of the dangerous and harmful effects of electric current on the human body; on the means of collective and individual protection of the employee; methods for calculating the current in a three-phase electrical network; about the types of short circuits in electrical networks. Draw up an equivalent circuit for an electric circuit to calculate the current value; on the effect of electric current on the human body, types of injuries;
47	Methods and means of environmental control and monitoring	Contributes to the development of knowledge of the theoretical foundations of environmental monitoring, methods and means of reducing environmental pollution, man-made systems and environmental risk; methods and means of reducing environmental pollution; to apply environmental methods in solving typical professional tasks; to identify negative impacts of the environment and to contribute to the improvement of the environment;
48	Safety of maghinery and technology	Forms knowledge of hazardous physical, chemical, biological, technological conditions in the field of labor protection and their laboratory and instrumental measurement methods; methods for studying the sustainability of the functioning of production

		facilities and technical systems in emergencies of a natural and man-made nature; apply means and methods of increasing the safety and stability of technical means and technological processes
49	Safety of technological processes and productions in the oil and gas sector	Considers the main problems of technosphere safety in Kazakhstan and solves problems in the field of minimizing of the technogenic impact of the oil and gas complex on the environment. Develops the necessary knowledge, skills and abilities in the field of application of modern efficient technologies of industrial wastes processing at oil and gas enterprises. Forming the ability to take the scientific and technically proved decisions at working at oil and gas enterprises
50	Ecological Equipment of Industrial Enterprises	Considers the basic principles, equipment and technologies in the field of environmental protection, types of technical means to ensure environmental safety. Study methods of ensuring environmental safety during the operation of technological machines and equipment. Acquires skills in building technological schemes to protect the environment from the harmful effects of pollutants
51	Operational Reliability and Durability of Technological Equipment	Study the theoretical foundations of reliability, the mathematical apparatus of the theory of reliability, methods for calculating the reliability parameters of technological machines and their elements, performance indicators, the rule of addition of probabilities. Makes sound engineering decisions in the operation and repair of technological machines and equipment, taking into account their level of reliability and durability. Keeps records and analyzes violations of the rules of technical operation of equipment.
52	Environmental mapping	Knowledge and understanding, analysis of the ecological situation and its dynamics, identification of the spatial and temporal variability of environmental factors affecting human health and the state of ecosystems. They acquire skills in collecting, analyzing, assessing, integrating, territorial interpretation and creating a geographically correct cartographic representation of diverse, often difficult to compare, environmental information.
53	Ecological Bases Chemicalixation of Agriculture	Studies the chemicalization of agriculture, ways to increase soil fertility, improve acidic and saline lands and ways to preserve and increase the nutritional value of feed. Gains knowledge about natural ecosystems and returns to the soil after the death and decay of plants.
54	Ecological aspect of modern farming	Study the soil use, the level of food supply for the population, the ecological state of the human environment, violation of environmental laws in the use of land leads to a drop in soil fertility, to

		pollution of the water and air environment. Gains knowledge on increasing the yield of agricultural crops and deteriorating the quality of agricultural products
55	Acquaintance with nature and ecology	Consider the methods of familiarizing preschoolers with nature and environmental education in a preschool institution, forms of organizing work to familiarize preschoolers with nature, planning and accounting for work to familiarize preschool children with nature.
56	Ecology of Water Resources	Know of standards and criteria for assessing the quality of natural waters; organization and maintenance of monitoring of natural waters, water legislation, the formation of technical and economic analysis and management of the water sector, water protection measures.
57	Biological Safety in Veterinary Medicine	Consider the issues of ensuring the resistance of livestock to infectious and invasive diseases, provide for measures to protect the condition of animals, preventive measures for disinfection, disinsection, deratization, protection of animals from pathogens of infectious diseases, Ability to apply methods of visual and technical control in veterinary activities; use equipment for disinfection and measurement of microclimate parameters in livestock buildings.
58	Ecology of flora and fauna	Demonstrates knowledge of plant indicative features to determine the state of plant communities and the environment. Expands knowledge about the combined action of abiotic and biotic factors in behavior, morphogenesis, and geographical distribution of animals. Applies in practice theoretical knowledge about the effect of environmental factors on plant organisms. Acquires skills in using the phytoindication method.
59	Economic and environmental management	orms ideas about the structure, composition and ecological functions of the geospheric shells of the planet Earth; about the interdependence of human society and geosystems, about the globality and universality of the nature of the main problems associated with the impact of humanity on the natural environment
60	Ecology and sustainable development	consider about the basic principles of public policy management. Develops understanding of the technique of applied sociology, the formation of judgments of the analysis of modern sociological and political theories, communication skills are manifested in the ability to work in a team and competently build communication, based on the goals and situation of communication.
61	Ecological Equipment of Industrial Enterprises	Considers the basic principles, equipment and technologies in the field of environmental protection, types of technical means to ensure environmental

		safety. Studying methods of ensuring environmental safety during the operation of technological machines and equipment. Acquires the skills of constructing technological schemes to protect the environment from the harmful effects of pollutants.
62	Principles of Waste-free Industrial Enterprises	Considers the environmental problems of industrial production; main directions of development of low- and waste-free industries. Develops modern technologies for capturing gaseous, liquid and solid industrial waste using the most effective methods and devices for neutralizing equipment. Acquires the skills of a qualified choice of specific methods of industrial waste disposal.
63	Safety of Processing Productions Products	Knowledge of the types of contaminants in raw materials and food products, safety standards. Enhanced knowledge of food safety and basic assessment criteria. Ability to determine the dangers of foreign substances from the external environment, to carry out classification, rationing, control of food additives. Application of mechanisms for regulating the quality and safety of food products. Knowledge allows you to independently collect and interpret information.
64	Safety and expertise of food products	Consideration of the danger of microbial and viral origin, parasites, toxins of natural origin. Characterization of food additives, genetically modified objects, packaging materials, detergents and disinfectants. Studying the examination and mastering the methods of detecting counterfeiting of food products, identifying types of products, improving the quality and forecasting when planning the composition and determining the quality indicators of products.
65	Introduction of food safety standards	Knowledge and understanding of the history and prospects for the development of the food safety system (HACCP), the benefits from the implementation of HACCP, international food safety standards ISO 22000, technical regulations of the Customs Union in the field of food safety. Skills in the development, implementation and support of procedures based on the principles of HACCP, carrying out confirmation of conformity of the HACCP system, procedures for issuing a HACCP certificate
66	Enviromental labeling	Knowledge and understanding of the essence and objectives of environmental labeling, the requirements of international standards for environmental labeling, the ability to analyze the types and forms of environmental information for labeling products, features of environmental labeling for various categories and types of products, skills in the formation of the necessary information

		for labeling, the choice of environmental signs, depending on the object of labeling.
67	Test and Kontrol Product Safety	Knowledge and understanding of test tasks in the product quality assurance system, the modern level of development of technological, mathematical, methodological, metrological and information support of tests, certification and test quality systems, the ability to use the testing methodology and technology, analyze the product control and test system, planning skills and processing test results, making decisions about the quality of products based on test results
68	Geoecology and nature conservation	Formation of knowledge on the theoretical foundations of geoecology and environmental protection. Knowledge and understanding of the essence of the spatio-temporal patterns of the interaction of communities with the natural environment, as well as the geographical patterns of the impact of the anthropogenic factor on geoecosystems.
69	Economic and environmental management	forms ideas about the structure, composition and ecological functions of the geospheric shells of the planet Earth; about the interdependence of human society and geosystems, about the globality and universality of the nature of the main problems associated with the impact of humanity on the natural environment.
70	The produse organization and business planning of soil protecting in agricultural complex	Knowledge and understanding of the patterns, principles, forms of organization of production, forms of entrepreneurial activity, business plan, leasing, commercial activity, acquires the skills to calculate the effectiveness of the use of progressive forms of organization and material incentives for labor; justification of the combination of industries in agricultural enterprises; substantiation of the organization of auxiliary and service industries at agricultural enterprises.
71	Chemical and Biological Protection of Plants	Considers modern means of chemical protection of agricultural crops from pests, modern means of chemical protection of agricultural crops from pathogens. Formation of knowledge and skills in chemical, plant protection from pests, diseases and weeds
72	Purification of Natural and Waste Water	Study of technologies and processes of natural water purification for drinking water supply and technological needs, as well as wastewater treatment. Determine the main indicators of water quality, select the device and calculate the technological parameters of the process, taking into account the implementation of energy and resource conservation tasks

73	Fundamentals of Traffic Saqfety of Agricultural	Studies the current status and challenges of mechanization of livestock farms; determines safety and environmental protection measures during the mechanization of the preparation and storage of feed, during machine watering of animals and when removing manure; Have the knowledge to use modern technologies and techniques to maintain an optimal microclimate in livestock buildings.
74	Ecological Mapping	Knowledge and understanding, analysis of the ecological situation and its dynamics, identification of the spatial and temporal variability of environmental factors affecting human health and the state of ecosystems. The ability to collect, analyze, assess, integrate, territorial interpretation and create a geographically correct cartographic representation of diverse, often difficult to compare, environmental information.
75	Ecological aspect of modern farming	The study of the use of soil, the level of food supply of the population, the ecological state of the human environment, the violation of environmental laws when using land leads to a drop in soil fertility, to water and air pollution. Gains skills to reduce crop yields to deteriorate the quality of agricultural products.
76	Protection of Soil from Erosion and Deflation	Studies the development patterns of the acquisition of theoretical knowledge and practical skills on the anti-erosion organization of the territory, its place in the general system of land management, content, methods and principles of drawing up land management projects with a complex of anti-erosion activities.
77	Technology Production of Vegetadle Cultures in the Protected Soil	Study intensive technologies for the production of vegetables, harvesting, production of vegetables in greenhouses, technology for the production of vegetables, methods and techniques for growing vegetables in greenhouses, technology for growing tomatoes, origin, economic value and nutritional value of melons, the value of melons, nutritional value and national economic significance of culture
78	Climate Change and Green Economy"	Explores climate change and its impact on natural and economic systems, analyzes regulatory documents on climate change. Studies transition to the green economy, history of formation of the concept of sustainable development and green economy in Kazakhstan, main directions of the Concept of the transition of Kazakhstan to the green economy: sustainable use of water resources; development of sustainable and high-performance agriculture.
79	Enviromental Magagement and the basis of tne Green Economy	Considers rational use and protection of natural resources of the Republic of Kazakhstan, classification of natural resources, problems

		depletion of natural resources, Analyzes principles of rational use of natural resources. Studies transition to the green economy, history of formation of the concept of sustainable development and green economy in Kazakhstan
80	Ecology of animfls,plants and biogeography	Considers biogeography and ecology in the system of geographical and biological sciences, the main stages in the development of biogeography and ecology, the general distribution of organisms to the characterization of individual biogeographic units; explains the peculiarities of the distribution of the types of their stories, methods of mapping the areas of biological objects
81	Bioindication Research Methods in Ecology	Considers environmental bases of bioindicative research methods. Studies biological indexes and coefficients in comparative bioindicative studies. Describes bioindication at the molecular and cellular levels of organization of biological systems, bioindication at the organism level. Investigates bioindication at supra-organismic levels of organization of biological systems.
82	Ecology of Populations and Communities	Studies ideas about ecological relationships in populations, relationships in biological systems, about dynamics and self-regulation of populations and biocenoses, main methods of their studying and methods of modeling. Considers formation of concepts about ecological communities and populations. Describes complex relationships of living organisms with each other and with the environment, about functioning features of different level ecosystems.
83	Geoecology and Nature Protection	Considers changes in the Earth's geospheres under the influence of human activity and emerging geo-environmental problems, place and connections of geo-ecology among the earth sciences. Studies global environmental problems of the Earth, anthropogenic transformations of the Earth's ecosystems, natural resources of Kazakhstan, its regional and national peculiarities. Analyzes environmental consequences of mining, reduction of natural biological productivity of ecosystems, hazard maps of anthropogenic desertification of part of the territory of Kazakhstan.
84	Ecological Aspect of Natural Science	Considers the ecological aspects of biology, biosphere and ecosphere. Chemistry of pollutants, chemical methods and means of environmental protection are analyzed. The physical types of pollution and energy flows in the biosphere are studied. A global energy-ecological strategy for sustainable development of the XXI century is discussed. Determine independently the ecological aspects of natural science

85	Ecological Resource Knowledge and of Natural Managment	Explores the intersectoral nature of environmental resource science. Explains the principles, methods and approaches for organizing technology for the economical use of non-renewable natural resources and the careful use of inexhaustible natural resources; Analyzes the ecological consequences of the distribution and structure of certain types of natural resources and their complexes; Evaluates the impact of industrial waste on the environment
86	Solid Waaste Management Technology their Sorting and Recycling	Examines the quantitative assessment of industrial waste, the classification of elements depending on the design of the chemical process system. Identifies examples of the complex use of raw materials and inorganic materials. Explores the use and disposal of waste plastics. Examines destructive polymers, waste decontamination and the use of secondary energy sources.
87	Soil Science With the Fundamentals of Ecology	Study modern research methods in the field of soil ecology, the most complex interactions of the pedosphere with other geospheres of the Earth, topical problems of the development of soil ecology and the doctrine of the biosphere functions of soils.
88	Ecological Problems in Agricultural Areas	Studies social and environmental problems of agriculture, environmental aspects of agricultural intensification. Considers the environmental problems of agricultural areas; Biological methods of pest control in agriculture are applied in practice; environmental problems of chemicalization of agriculture are being solved; independently apply biological fertilizers and plant protection products, independently find ways to solve environmental problems of land resources
89	Enviromental Monitoring	Explores the content and structure of environmental monitoring, objects of environmental monitoring, the classification of types of monitoring by objects, methods of tracking. Considers the essence, specificity and properties of environmental monitoring; independently apply the acquired knowledge in order to use modern methods and means of environmental monitoring using examples of educational data
90	Enviromental Protection Methods	Considers methods of protecting the environment from industrial pollution. Explores active and passive methods, basic principles, methods and means of environmental protection. Acquire skills of independent use of physicochemical and biological research methods, electrochemical methods of analysis.
91	Agroecology	Studies human interaction with the environment in the process of agricultural production, the impact of agriculture on natural complexes and their components. Describes the interaction between the

		components of agroecosystems and the specifics of the cycle of substances in them, energy transfer, the nature of the functioning of agroecosystems under conditions of technogenic loads. Considers anthropogenic impacts on the biosphere, negative impacts on the agricultural system.
92	Modern Urban Problems and Urboecology	Describes the features of urban (large) ecosystems. Examines urban ecosystems, studies the process of urbanization and its impact on the environment. Investigates the sources of urban pollution, factors of the city's noise "symphony": the roar of railways and the hum of aircraft, the rumble of construction equipment, the noise of industrial enterprises and household appliances.
93	Social Ecology and Sustanable Develoment	Considers the historical and socio-ecological prerequisites for the formation of a sustainable development strategy. Explores the relationship between society and nature at different periods of civilization development. Studies the stability of biological systems at the level of species populations, communities of organisms and ecosystems, problems of social ecology.
94	Technique of Enviromental Protection	Considers the main treatment facilities and equipment for waste treatment, methods of industrial wastewater treatment (mechanical, biochemical, chemical, physical and chemical). Analyzes the classification of methods for cleaning liquid, gaseous, solid waste. Calculates costs and concentrations of pollution, main treatment facilities
95	Environmental Problems of Branch Technologies	Examines the current state of industrial sectors of the Republic of Kazakhstan, the impact on the environment of various industry technologies, methods of protecting the hydrosphere, atmosphere and lithosphere. Explores the environmental problems of industries and analysis of their state, the main factors, the location of industrial production. Analyzes the methods of waste disposal of various industries and the use of energy-saving technologies in production.
96	Environmental Management and Control at the Enterprise	Studying the types and structure of environmental management and control at the enterprise. Considers state natural resource cadastres as a function of state management in the field of environmental management and control at enterprises. Conceptual foundations and methodology of state environmental management and environmental protection. Explores the types of management of natural resources and environmental protection, as well as forms and instruments of state management of natural resources. Describes the basic concepts, principles, objects and structure of natural resource cadastres.

97	Resource-Saving.Low-waste and Non-waste Technologies	Considers the principles of developing low-waste and non-waste industries, the principles of consistency, the principle of the cyclical nature of material flows, the principle of the integrated use of raw materials. The principle of environmental safety, the principle of rational organization of waste-free production is studied. Have the skills to organize work with radioactive waste and choose the methods of cleaning and storage.
98	Labor safety in silicate industry	Forms knowledge of labor protection legislation, labor safety in the silicate industry; considers the OSH management system at enterprises; regulatory and technical documentation; indicators used to assess working conditions; industrial sanitation and protection from harmful production factors; fire safety system at enterprises for the organization of labor safety at work
99	Ecological problem in silicate industry	Forms an environmental outlook and the ability to make science-based decisions to prevent the impact of anthropogenic factors on human health, to understand the impact of chemical pollutants on the environment; considers methods of cleaning exhaust gases, processing solid waste, the effectiveness of dust collecting devices, their design, design features, principles of dust deposition and the selection of the necessary dust removal equipment
100	Ecology and Enviromental Protection of Polymer Enterprises	Examines the fundamentals of environmental issues associated with the operation of polymer production facilities; scientific, practical achievements in the field of industrial ecology, engineering protection of the environment; the possibilities of intensifying the existing ones, ways of developing new, more efficient processes of neutralization, the use of waste from polymer production. Teaches skills to perform calculations of economic damage from environmental pollution by polymer production enterprises
101	Enviromental Aspects of Production and Application of Oil Refining Products	Considers methods of cleaning and disposal of hazardous emissions and waste from oil refineries, the impact of power plants and vehicles on the environment, methods of reducing air and soil pollution during the storage of petroleum products. Acquires skills in the development and implementation of environmentally friendly technological processes and modes of production of oil refined products and disposal of gaseous, liquid and solid waste.
102	Enviromental Safety of Oil Refning	Considers the main factors of the negative impact of hydrocarbon systems, petroleum hydrocarbon systems and environmental aspects of their production and use; the energy potential of the enterprise and the level of danger; features of

		operation of devices with increased fire and explosion hazard; risk and likelihood of emergencies; classification of destruction zones in case of an accident at an oil refinery; prevention of emergency situations
103	Ecology of Petrochemical Industries	Examines the fundamentals of environmental problems associated with the operation of petrochemical production; scientific and practical achievements in the field of industrial ecology and engineering environmental protection; the possibilities of intensifying existing ones and methods of developing new, more efficient processes for the purification of petrochemical industrial waste
104	Enviromental Problems of Production and Consumption of Petroleum Products	Considers the classification of atmospheric emissions and their characteristics; purification of atmospheric emissions from solid particles and acidic components. Examines wastewater treatment, oil sludge processing, disposal of waste oil products; rationing of harmful substances that pollute the atmosphere, soil and water bodies. Instills the skills of analyzing problems and methods for reducing emissions of hydrocarbons and their derivatives.
105	Enviromental Safety of Oil Refining	Considers the main factors of the negative impact of hydrocarbon systems, petroleum hydrocarbon systems and environmental aspects of their production and use; the energy potential of the enterprise and the level of danger; features of operation of devices with increased fire and explosion hazard; risk and likelihood of emergencies; classification of destruction zones in case of an accident at an oil refinery; prevention of emergency situations
106	Enviromental Problemsin the Technology of Inorganic Substances	Considers ways to reduce and eliminate harmful emissions, properties of air pollutants, methods of cleaning waste gases, gaseous and vaporous impurities, equipment used. Analyzes the conditions for the discharge of wastewater into water bodies, methods of disposal and processing of solid waste, the complex use of raw materials, methods of purification and recovery. Teaches you how to independently calculate the material balances of industrial waste treatment, evaluate the effectiveness of various methods of cleaning industrial waste
107	Enviromentally Safe Technologies	Considers the relevance and importance of environmentally friendly (low-waste and zero-waste) technologies, principles of organizing waste-free production: consistency, integrated use of raw materials, cyclic material flows, environmental safety, combination and inter-industry cooperation of industries. Forms the skills to independently calculate the material balances of industrial waste treatment; evaluate the effectiveness of various methods of

		cleaning industrial waste and utilizing valuable components
108	Creation of Less-Wastle Technologies in Agroindusrtial Productions	Consider the organization and principles of the formation of environmentally friendly and energy-saving technologies in agro-industrial production. Consider the theoretical and practical foundations of the organization of environmentally friendly agricultural production. They offer new theoretical and practical approaches to solving the problem of developing and improving environmental protection processes and creating low-waste biotechnological production on their basis.
109	Enviromental chemistry and Chemistry of rare-metal raw materials	Study the patterns of accumulation, spatio-temporal distribution and physicochemical transformations of environmental pollutants, predicting the behavior of chemical pollution under the influence of various natural factors and anthropogenic influences, reducing the level of chemical pollution of environmental objects with the most dangerous pollutants for the ecosystem, creating methods and tools for analysis and monitoring environmental pollutants
110	Environmental Problems in Chimical Engineering	Considers ways to reduce and eliminate harmful emissions, properties of air pollutants, methods of cleaning waste gases, gaseous and vaporous impurities, equipment used. Analyzes methods of disposal and processing of solid waste, wastewater treatment, complex use of raw materials. Teaches you how to independently calculate the material balances of utilization and treatment of industrial waste, evaluate the effectiveness of various cleaning methods.

№	**Course title** (Master's Programs)	**Notes**
1	Planning and design in the regional economy	Promotes the formation of a modern type of economic thinking and behavior based on the development of ideas about the structure and functions of the main links of the market economy. Justifies the logic and efficiency of the main economic processes. Evaluates the principles of making optimal economic decisions. It forms the basis for the functioning and interaction of economic entities. Recommends ways of solving urgent problems of planning and forecasting the development of regions.
2	Regional resource management	Forms practical skills in the field of regional economics and management of socio-economic processes in the country, taking into account the characteristics of the industries that have developed in them and the territorial structure of the economy. Distinguishes between principles and methods of managing sustainable development of the region. Analyzes the current level of industrial development in Kazakhstan. Characterizes the types of resources in the region and the tasks of their rational use.
3	Cluster policy and industrial development of the region	Considers current trends and mechanisms of cluster development at the state and regional levels. Evaluates the impact of cluster policy on the development of industry in the region. Illustrates the key factors of the effectiveness of the development of territorial clusters. Reveals the essence of cluster policy, taking into account its relationship with other instruments to support socio-economic development
4	Innovative development of the regional economy	Analyzes innovation processes in various areas of innovative development of regions. Allows to carry out structural and dynamic analysis of the innovative development of regions. Searches for statistical information that reflects the patterns of innovative development of the region. Contributes to the monitoring of the economic and social development of regions of different levels. Assesses the socio-economic factors of the region's innovative development and the effectiveness of state management of innovative development.
5	Strategic investment planning	Considers methodological and methodological issues in the development of investment projects. Distinguishes between sources of financing for investment projects. Arguments the financial justification of investment projects and their financial stability. Distinguishes between the principles of determining the economic efficiency of investment projects. Subjects critical analysis of the methodology for assessing future costs and results of investment projects and the effectiveness of

		investment projects in a market economy.
6	Medico- ecological foundations of sustainable development	Considers the philosophical and methodological problems of interaction between medicine and ecology. Medical and ecological aspects of managing environmentally friendly sustainable development. Medical and ecological parameters of sustainable development. Formation of a risk culture as a condition for environmentally friendly sustainable development. Human health in ecological and demographic culture. Health as a social value.
7	Ways and methods of ensuring the safety and stability of the functioning of technical systems	Describe the ways and methods of ensuring the safety of technical systems. Outline the main methods of ensuring the stability of the functioning of technical systems. Show the ability to successfully operate technical systems in modern conditions. Consider an action to improve the stability of technical systems in modern conditions.