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. Understand 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**	Calculation the maximum permissible concentration of

	Production	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 wastewater treatment methods: neutralization, oxidation, reduction and removal of heavy metalions.
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. A knowledge allows independently collect and interpret the informations.
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**	Competenceon the basic concepts of quality and safety of livestockproducts, thevalue of quality and safety indicators of livestock products;the quality and safety assessmentof 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 environment and 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	**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.
23	**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;
24	**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.
25	**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.
26	**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.
27	**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.
28	**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
29	**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.
30	**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.
31	**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
32	**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.
33	**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
34	**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
35	**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.

36	**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.
37	**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
38	**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.
39	**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
40	**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
41	**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.
42	**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

43	**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
44	**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;
45	**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;
46	**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
47	**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
48	**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
49	**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.

50	**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.
51	**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.
52	**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
53	**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.
54	**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.
55	**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.
56	**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.
57	**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
58	**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.
59	**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.
60	**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.
61	**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.
62	**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.
63	**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
64	**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.
65	**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
66	**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.
67	**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.
68	**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.
69	**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
70	**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, considering the implementation of energy and resource conservation tasks
71	**Fundamentals of Traffic Safety 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.
72	**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.
73	**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.
74	**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.
75	**Technology Production of Vegetable 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
76	**Climate Change andGreen 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.
77	**EnvironmentalManagement 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
78	**Ecology of animals, 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
79	**Bioindication Research Methods in Ecology**	Considers environmental bases of bio indicative research methods. Studies biological indexes and coefficients in comparative bio indicative 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.
80	**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.
81	**Geo-ecology 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.
82	**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
83	**Ecological Resource Knowledge and of Natural Management**	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
84	**Solid Waste 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.
85	**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.
86	**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
87	**Environmental 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
88	**Environmental 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.
89	**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.
90	**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.
91	**Social Ecology and SustainableDevelopment**	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.
92	**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
93	**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.
94	**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.
95	**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.
96	**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
97	**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
98	**Ecology and Environmental 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
99	**Environmental 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.
100	**Environmental 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
101	**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
102	**Environmental 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.
103	**Environmental 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
104	**EnvironmentalProblems in 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
105	**Environmentally 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
106	**Creation of Less-Waste 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.
107	**Environmental 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
108	**Environmental Problems in Chemical 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.

109	**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
110	**Environmental 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.
111	**EnvironmentalProblems in the Technology of Inorganic Substances**	Considers ways to reduce and eliminate harmful emissions, the properties of air polluting substances, methods for cleaning exhaust gases, gaseous and vapor impurities, used equipment. Analyzes conditions for sewage release into reservoirs, methods of utilization and processing of solid waste, complex use of raw material components, methods of cleaning and recovery. Teaches to independently calculate mass balances of industrial waste purification.
112	**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.
113	**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
114	**Geoinformation Systems in Ecology**	Studies modern computer technology in the collection, storage, processing, analysis and transmission of geographical information. It assesses the geo-ecological knowledge of the area of work using modern specialized software. Formulates the idea of geo-information systems, their general purpose and application in ecology, independently uses modern computer technologies to solve environmental problems.
115	**Modeling in Ecology**	Explores brief description of models, principles for constructing ecological models, elementary mathematical models; creates elementary mathematical models. Conducts technical calculations using mathematical methods, uses methods of mathematical analysis and statistical modeling in ecology, independently integrates this knowledge to carry out engineering calculations, design and research and development tasks in the field of mathematical modeling.

116	**Fundamentals of Enviromental Regulation and Examination**	Considers basics of environmental regulation, mechanisms of environmental regulation, history of the EIA, content and theoretical foundations of environmental regulation and expertise, terms and definitions; arguing principles, criteria and objects of environmental impact assessment. Independently used environmental regulations in the field of ecology. Analyzes principles and structure of environmental impact assessment.
117	**Environmental Waste Inventory**	Studies state cadasters of natural resources of the Republic of Kazakhstan, ecological inventory of wastes, classification of natural inventories. Analyzes main content of state cadasters and basics of cadastral work. Defines relationship of cadastral work with environmental management and nature protection
118	**Intemational Legislation in the Field of Ecology**	Considers problems of interaction between society and nature, international organizations, role of international organizations in solving environmental problems of our time, international treaties, the Paris Agreement on Climate Change. Analyzes information about international organizations and international treaties
119	**Fundamentalsof Energy Ecology and Sustainable Development**	Examines the fundamentals of energy ecology, historical and socio-environmental prerequisites for the formation of a sustainable development strategy. The relationship between society and nature in different periods of civilization. The sustainability of biological systems is determined at the level of species populations, communities of organisms and ecosystems.
120	**Air Basin Protection**	Considers aero-dispersed systems, changes in the air environment as a result of activities of industrial enterprises, and air pollution. Studies types of pollutants, main methods of cleaning and equipment for cleaning gas and dust emissions, air pollution by road transport, impact of air pollution on human health and atmospheric protection, legal protection of atmospheric air.
121	**Economic and Ecological Evaluation of Enterprises**	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
122	**Medical Ecology and Social and Environmental Problems of Mankind**	Studies social and environmental problems of mankind, stability and reliability of biological systems. Studies general laws of adaptation of human body to changes in the environment. Investigates pathogenetic mechanisms of physical, chemical and biological factors on the human body. Describesenvironmental problems of nutrition and effect on the human body of various food products that have been modified at the gene level. Ecological and social features of a person.
123	**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.
124	**EnvironmentalManagement 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
125	**Ecology of animals, 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
126	**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.
127	**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.
128	**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.
129	**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.
130	**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
131	**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.
132	**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
133	**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
134	**Ecology and Environment on Oil and Gas Crafts**	To have information about the impact of the oil and gas industry on the state of water resources, the development of oil production in offshore fields, sources of pollution of waters of the seas and oceans with oil. Know the measures to prevent marine pollution and oil spill response, especially oil pollution of the Caspian waters, the main sources of pollution in marine oil production.
135	**Ecology and Environment on Oil and Gas Crafts**	To have information about the impact of the oil and gas industry on the state of water resources, the development of oil production in offshore fields, sources of pollution of waters of the seas and oceans with oil. Know the measures to prevent marine pollution and oil spill response, especially oil pollution of the Caspian waters, the main sources of pollution in marine oil production.
136	**Ecology and Environment on Oil and Gas Crafts**	To have information about the impact of the oil and gas industry on the state of water resources, the development of oil production in offshore fields, sources of pollution of waters of the seas and oceans with oil. Know the measures to prevent marine pollution and oil spill response, especially oil pollution of the Caspian waters, the main sources of pollution in marine oil production.
137	**Anticorrosive Protection of Oil and Gas Equipment**	Know the classification of corrosion processes types of corrosion damage. Possess information about electrochemical corrosion, types of corrosion elements. To have information about the kinetics of gas corrosion, corrosion indicators, passivity of metals and alloys, classification of corrosion aggressiveness of the atmosphere, to Have methods for assessing the corrosion aggressiveness of the atmosphere, biochemical corrosion of metals.

138	**Corrosion and Protection of Metals**	Know electrochemical corrosion of metals, classification of anticorrosive protection. Be aware of corrosion inhibitors, cathodic and anode protection. Possess information about corrosion-resistant materials, metal and non-metallic materials, properties, scope, protective coatings, the relationship between the operating conditions of gas and oil pipelines and gas storage facilities with the peculiarities of corrosion processes, especially corrosion processes in the extracted and transported products.
139	**Objects of Standardization and Confirmation of Conformity**	Knowledge of the objects of standardization and the system of attestation of conformity, understanding of the qualifications of objects of standardization, the principles of choosing certification schemes to confirm the conformity of products, processes and services, the ability to use standardization methods in the development of normative documents for standardization objects and the system of attestation of conformity, skills of working with the information base for standardization and confirmation compliance, national and international standards, revision of existing standards and documents for confirmation of conformity
140	**Testing Methods, Quality Control and Product Safety**	Knowledge of the basic test methods for quality control and product safety, understanding of certain principles and means of testing, types, sequence, scope of experiments, order, conditions, place and timing of tests, the ability to select a test method depending on the test object, plan and organize tests, have the skills to conduct tests, draw up test reports, draw conclusions based on the test results.
141	**Normative Basls of CU Food Safety**	Knowledge and understanding in the field of the regulatory component of the food safety system in the countries of the Customs Union, technical regulations of the CU and EurAs, national standards of the CU countries in the field of food safety, harmonized with ISO 22000, skills of implementing HACCP principles at food safety enterprises food compliance
142	**Protection of Agricultural cultures Against Wreckers and Diseases**	Studying methods and types of plant protection. Considers modern means of chemical protection, materials for biological protection of agricultural crops from pests and pathogens. Forms the skills of a complex of knowledge and skills in chemical, plant protection from pests, diseases and weeds.
143	**Protection of Agricultural cultures Against Wreckers and Diseases**	Examines the patterns of infection, the emergence of foci of pests and diseases; on the morphology and anatomy of pests and measures to protect plants from them. Considers the identification of pest species by the nature of damage to plants, by the type of their development, by the ways of their life and distribution; Forms the skills of researching a sick plant, knows how to find the focus and nature of infection; make short-, medium-, long-term forecasts of the spread of various diseases.
144	**Chemical and Biological Protection of Plants**	Studying chemical and biological materials for protecting crops from pests and diseases. Examines modern methods and methods of pest and disease control. Forms knowledge and skills in the chemical and biological protection of plants from pests, diseases and weeds.

145	**Chemical and Biological Protection of Plants**	We consider modern means of chemical protection of agricultural crops from pests, modern means of chemical protection of agricultural crops from pathogens. Skills formation of a complex of knowledge and skills in chemical, plant protection from pests, diseases and weeds.
146	**Protection and Effective Use of Land from Erosion**	Knowledge of standards and criteria for drawing up schemes and forecasts of land use, design inter-farm, intra-farm and local land management, considering land reclamation and improvement, develop anti-erosion measures
147	**Integrated Plant Protection**	Know and understand the use of two or more plant protection methods to suppress pests and diseases. The use of pheromones . attractants against plant pests - attracting insects using pheromone traps to determine the period of their appearance, as well as its reduction. The effectiveness of plant protection from pests and diseases is the use of a set of forest protection methods.
148	**Protection from Quarantine objects**	Learn to acquire skills of particular relevance for agricultural producers , land owners of all purposes is gaining control of especially dangerous quarantine weeds due to the fact that they cause significant damage to the crop. In addition, the emergence of quarantine weeds leads to significant economic losses associated with the introduction of quarantine plants in business entities that restrict, prohibit production, storage, processing
149	**Protection of Ftuits and Berry Crops from Pests and Diseases**	Knowledge of fruits and vegetables. Carry out pest and disease surveys; correctly and efficiently use a complex of technical, chemical, biological and other methods of plant protection, taking into account environmental protection, apply technologies for growing fruit crops in solving problems in fruit growing; technologies for laying orchards and fruit plantations; main accounting methodsand assessing the incidence of fruit and vegetable plants with diseases and pests
	Course title (Master's Programs)	**Notes**
150	**Protection of vegetables from pests and Diseases**	It studies pests and diseases of vegetable crops. Taxonomy, biology and harmfulness of representatives. Pests of fruit and berry crops. Taxonomy and biology of representatives. Insects: Homoptera (aphids), Semi-winged (shield insects), Coleoptera (leaf beetles, weevils), Lepidoptera (whites, fireworms, moths), Hymenoptera (sawflies), dipterans (real flies). Phytosanitary assessment of vegetable crops. Special control measures for various groups of pests. Integrated vegetable protection
151	**Digitalization in Ecology fnd Nature Management**	Considers the digital economy in ensuring environmental safety, digital technologies for monitoring natural and anthropogenic systems and digital services in the field of environmental management.
152	**Actual Problems of Geocology and Landscape Ecology**	Studies changes in the Geosphere of the Earth under the influence of human activity and emerging geoecological problems. Considers the basic concepts, object, tasks, methods, evolution of views, place and connection of actual problems of Geoecologyand the land reclamation section,

		covering the improvement of the natural conditions of agricultural land with protective forest plantations. Theoretical and methodological bases of actual problems of Geoecology and landscape ecology. System character of actual problems of Geoecology and landscape ecology.
153	**Organization of Environmental Audit**	Examines the types of environmental audit and the basis for its implementation. Analyzes the principles of environmental audit. Discusses and details the decision on mandatory environmental audit. It illustrates the features of the mandatory environmental audit. Develop audit of environmental management systems. Discusses the Legislation of the Republic of Kazakhstan in the field of environmental audit, legal and regulatory documents that define the legal framework.
154	**Ecological Standardization, Certification and Licensing**	Examines the activities to establish norms, rules and characteristics in order to ensure product safety, State standards of the Republic of Kazakhstan, international standards, Kazakhstan classifiers of technical and economic standardization. It examines the standards of industries, enterprises, scientific and technical, engineering companies and other public associations, government agencies engaged in standardization, licensing of certain activities in the field of environmental protection.
155	**Ecological Safety Technology in Industry**	Examines the basic concepts and methodological principles of the formation of waste-free production, the basic concepts and methods of organizing low-waste production, the requirements for waste-free technological processes and equipment, the problems of developing highly efficient technological processes, environmental protection processes and technologies. Analyzes the mathematical modeling of technological processes, taking into account the criteria of chemical-technological and environmental factors for efficiency indicators.
156	**Modern methods and measuring instruments in ecology**	Considers methods and means of monitoring and control over the state of the environment, contact methods of environmental control, remote methods of environmental control, biological methods of environmental control. Analyzes environmental control, modern methods of air pollution control, methods of atomic spectroscopy, reporting on the results of instrumental measurements.
157	**Physico-Chemical Tests in the Field of Ecology**	Examines ttypes and characteristics of environmental pollution, physical and chemical methods of analysis in ecology, main methods of environmental analysis, studies methodology and methods of research, general characteristics of physical and chemical methods, general information about spectroscopic methods of analysis, conducting a comprehensive analysis of the environment and quantitative assessments environmental analysis, spectra of pollutants in the water of aqueous bodies.
158	**Environmental Aspects of Green Technologies**	Examines mechanisms of human exploration of natural resources and resource ecological function of the lithosphere, mineral reserves (minerals). Assesses the main geological and industrial types of deposits of metallic and non-metallic minerals. Identifies geoecological problems of mining and processing of mineral and energy raw materials. Assesses natural resource potential and criteria for

		environmental management. Argues the general issues of economic assessment of natural resources and the system of accounting and assessment of certain types of resources. Compares the accounting of mineral reserves / resources in foreign countries.
159	**Environmental Problems of Natural and Technical Systems**	Considers various aspects of emergence and functioning of natural-technical systems, fundamentals of natural-technical systems, formation mechanisms of natural-technical systems and forms of technogenesis. Restores natural and technogenic objects. Assesses the natural-technical system as a structural-functional unit of biotechnosphere. Improves formation and functioning of the natural-technical system, mode of operation and control interactions. Argues the principles of optimization of the natural-technical system and management of its operation