

MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN

KARAGANDA UNIVERSITY NAMED AFTER ACADEMICIAN E. A. BUKETOV



Director of "Karakaly State
National Nature Park"

Darbayev A.Kh.

" 15 " 2022.

«CLAIM»



Chairman of the Board-rector of Karaganda
University named after Academician E.A. Buketov

N. O. Dulatbekov

" 16 " 2022 year

«AGREED»

Acting Head of the Karaganda Regional Territorial Inspectorate of
Forestry and Wildlife of the Forestry and Wildlife Committee of the
Ministry of Ecology, Geology and Natural Resources of the Republic of
Kazakhstan

Kim A.V.

" 15 " 2022 year



EDUCATIONAL PROGRAM

in the field of training 7M051-Biological and related sciences

"7M05101-Biology"

Level: Master's Degree

Karaganda, 2022

Educational program in the direction of training "7M051 Biological and related Sciences" developed on the basis of:

- Law of the Republic of Kazakhstan dated July 27, 2007 № 319-III "On education"
- Law of the Republic of Kazakhstan dated July 11, 1997 No. 151-I. "On languages in the Republic of Kazakhstan",
- The State mandatory Standard of Postgraduate Education of Education No. 604 of August 31, 2018
- The National Qualifications Framework of March 16, 2016 by the Republican Tripartite Commission on Social Partnership and Regulation of Social and Labor Relations.
- Order of the Ministry of Education and Science of the Republic of Kazakhstan" On approval of the Rules for organizing the educational process on credit technology " dated October 2, 2018 No. 152
- Classifier of areas of training of personnel with higher and postgraduate education dated October 13, 2018 No. 569.
- Professional Standard " National Qualifications Framework (2016) "(Approved by the protocol of March 16, 2016 of the Republican Tripartite Commission on Social Partnership and Regulation of Social and Labor Relations)
- Industry Qualifications Framework "Industry Qualifications Framework for Education" (Approved by Protocol No. 2 of the meeting of the sectoral Tripartite Commission on Social Partnership and Regulation of Social and Labor Relations under the Ministry of Education and Science of the Republic of Kazakhstan dated November 23, 2016)

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№	Passport of the educational program
1	Code and name of the educational program: «7M05101- Biology »
2	Code and classification of the field of education, areas of training: 7M05 – Natural Sciences, Mathematics and Statistics Field of study: 7M051 – Biological and related sciences
3	Group of educational programs: M080 – Biology
4	Volume of loans: 120 ECTS
5	Form of training: full - time
6	Language of instruction: Kazakh, Russian
7	Degree awarded: Master of Natural Sciences in the educational program 7M05101 — "Biology"
8	Type of EP: current
9	Level according to ISCE – Level 7;
10	Level according to NQF – Level 7;
11	Level according to IQF – Level 7;
12	Distinctive features of EP: none
	Partner University (JEP)
	Partner University (TDEP)
13	Appendix number to the license for the direction of training: KZ83LAA00018495, dated 28.07.2020; appendix No. 011
14	The name of the accreditation body and the validity period of the accreditation of the EP: Independent Agency for Quality Assurance in Education (IQAA) (Certificate of International Accreditation of Educational Programs SA-A No.0193/1 dated November 09, 2020; certificate validity period November 09, 2020 – November 08, 2027)
15	The objectives of the educational program Formation of a competitive specialist in the labor market of a biologist with a high level of theoretical and practical training and able to independently conduct scientific research in various fields of biology.

16. Qualification characteristics of the graduate

a) List of graduate positions

- teacher, specialist and laboratory assistant in universities, engineer, laboratory assistant in research institutes, sanitary and epidemiological stations; - biology teacher in secondary schools, gymnasiums, colleges; - specialist in national parks, nature reserves, zoos, botanical gardens, yunnat stations, breeding and anti-plague stations, nature museums; - senior technician, technician of scientific and production, design and geobotanical organizations; - specialist in environmental services and organizations; -specialist in state management organizations, akimats and other institutions

b) The scope and objects of professional activity of the graduate

The sphere of professional activity is the field of ecology and biology: ecology, toxicology, hygiene, botany, zoology, human anatomy and physiology, biochemistry, biophysics, microbiology, etc.; biological systems of various levels of organization, biological environmental technologies.

The objects of professional activity of masters in the educational program "7M05101-Biology" are:

- research institutes;
- nature reserves, zoos, plant protection stations;
- sanitary-epidemiological and anti-plague stations;
- departments and departments of ecology at district and regional akimats.
- - botanical gardens, arboretums, nature museum;
- research, production, medical, pharmaceutical, agricultural institutions, etc.

c) Types of professional activity of the graduate

- educational (teaching);
- production and management;
- organizational and technological;
- scientific research;
- environmental protection;
- project

d) Functions of the graduate's professional activity

- collects and processes biological material in the field and in the laboratory;
- performs analysis, classification of objects and registration of results;
- performs scientific research;
- implements the results of scientific research into production;
- provides methodically competent formulation of experiments;
- organizes information and search work in the chosen scientific direction;
- attracts employers and partners to carry out scientific research; provides teaching of biological disciplines in secondary and secondary professional and higher educational institutions

Formulation of learning outcomes based on competencies

Type of competencies	Learning result code	Learning result (according to Bloom's taxonomy)
1. Behavioral skills and personal qualities: (Soft skills)	LO1	Demonstrates knowledge of the basic modern epistemological models and approaches of social and humanitarian, natural science, pedagogical and psychological Sciences in higher education and their comparability; knows and understands modern problems of history and philosophy of science, the laws of logical and scientific thinking, the main stages and logic of scientific research.
	LO2	He is able to use the basic provisions and methods of psychology and management in professional activities, applies psychological methods and techniques of regulation in the management sphere and in the field of conflict resolution between the subjects of interaction.
	LO3	Analyzes the results of modern research in biology and at the intersection of sciences for self-improvement, conducting independent research and scientific-pedagogical activities and professional mobility.
	LO4	Fluent in foreign languages at a level that allows effective interaction in the professional and scientific environment, using new information from various English-speaking biological scientific sources in the process of self-continuation of their training and research activities.
	LO5	Publicly presents the results of their own research in a foreign language, showing the skills of cooperation to improve skills in the global and scientific space, including abroad.
	LO6	He has practical skills, professional competencies and methods of strategic analysis in the field of organization of work on the commercial use of research results and evaluation of commercial potential.
2. Digital competencies: (Digital skills):	LO12	Understands the basic principles of using ICT in scientific research, applies computer methods of analyzing biological systems to solve natural science problems and to conduct evaluation activities and implement modern forms of critical thinking in the digital environment
	LO13	Evaluates the effectiveness of the results of his own scientific research when writing scientific articles and theses, using the skills of working with personal computing equipment, with graphic editors, with applied computer programs, with databases of natural science.
	LO14	Evaluates the reliability of scientific results using digital algorithms in order to effectively use the information for further work with the obtained biological data.
3. Professional competencies: (Hard skills)	LO7	He owns methods and methods of management of innovative activity in the field of biology, demonstrating knowledge of modern trends, trends and patterns of development of domestic science in the context of globalization and internationalization.
	LO8	Formulates the provisions of the main modern theories and concepts of evolution to demonstrate his vision of the ways of development and prospects for the preservation of civilization and the connection of geopolitical and biospheric processes.
	LO9	Chooses the correct ethical position of a specialist biologist when performing his own research using the latest experimental research methods and information technologies in the field of genetics, cellular and evolutionary biology.
	LO 10	Demonstrates the ability to identify and analyze the essence of the problems arising in the field of management and protection of endangered species and maintain the evolutionary potential of animal populations, and plan a strategy to solve them, based on advanced knowledge in the field of biology of nature protection, modern research methods, methods of regulation and inventory of animals.
	LO 11	Solves problems arising in the course of independent research, scientific and pedagogical, organizational, social and environmental activities, based on an understanding of the peculiarities of animal population management, environmental principles of rational nature management and methods of environmental expertise.

Determination of modules of disciplines in accordance with the results of training

Код резултата обучения	Name of the module	Name of disciplines	Volume (ECTS)
LO 1	Philosophical and historical aspects of social and humanitarian knowledge	History and philosophy of science	4
LO 2		Higher school pedagogy	4
LO 3		Psychology of management	4
LO 4		Pedagogical practice	4
LO 1	Professional languages	Foreign language (professional)	4
LO 2		Scientific terminology in Biology (in English)	5
LO 6		Theory and practice of scientific communication in biology	
LO 1	Issues of modern science and technology	Commercialization of the results of scientific and technical activities	5
LO 4		Introduction of scientific research in education into practice	
LO 8		Innovative technologies in the course of biology	5
LO 9		Prospects for the development of biological science	
LO 10			
LO 1	Methods of biological research	Field research methods	5
LO 4			5
LO 6		Cytopathology	
LO 9			
LO 1	Theoretical and applied biology	Evolutionary Biology	5
LO 2		Zoological aspects of ecosystem service	
LO 3		Wildlife Conservation (in English)	4
LO 4		Animals in the global community (in English)	4
LO 5		Cell morphogenesis	
LO 6		Genetic and Cellular Engineering	
LO 7		Modern problems of biology	4
LO 8		Methods and prospects of modern biology	
LO 9		Bioethics	4
LO 10		Ethics of biological research	
LO 11		Test objects of the animal world in the bioindication of the environment	4
	Biomonitoring	14	
	Research practice		
LO 1	Final certification	Registration and defense of a master	12
LO 5			
LO 8			
LO 9			

Matrix of achievability of learning outcomes

NN π/π	Name of disciplines	Brief description of the discipline (30-40 words)	Number of credits	Generated learning outcomes (codes)														
				LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12	LO13	LO14	
Cycle of basic disciplines University component																		
D1	History and philosophy of science	The history and philosophy of science as the study of the general laws of scientific knowledge in its historical development and changing socio-cultural context. Philosophy of science and methodology of science. Science as a cognitive activity and tradition, as a social institution and as a special sphere of culture. Science in the culture of modern civilization. Features of scientific knowledge. The functions of science in the life of society. Historical development of institutional forms of scientific activity. Scientific communities and their historical types.	4	+		+												
D2	Higher school pedagogy	Pedagogy of higher education is designed to put on a scientific basis as a solution to the problem of higher education for specific specialties, and the development of undergraduates in their future professional management of the process of mastering this content. Pedagogy of higher education allows to scientifically substantiate the requirements to the modern educational process and to reveal its regularities.	4	+		+											+	
D3	Psychology of management	Basic concepts, theoretical positions and actual problems of management psychology. Theoretical features of management psychology. Personal characteristics of the manager. Features of communication between the head and subordinates in the organization. The main aspects of management psychology. Psychological aspects of business communication, motivational aspects of management.	4	+	+	+												+
D4	Pedagogical practice	Methodology of conducting independent research and scientific and pedagogical activities that require a broad multidisciplinary education. Development and conduct of lectures, practical classes in the disciplines. Development of tasks for independent work of students, IWST.	4	+	+		+										+	+

		Methods of educational work with students.															
D5	Foreign language (professional)	Possession of a commonly used lexical and terminological minimum in the specialty, grammatical forms and constructions used in speech, including in the functional aspect, at the level allowing it to be used as a means of personal and professional communication, competently express your own thoughts in a foreign language in oral and written speech, skills for effective communication in a professional environment.	4				+	+									
Cycle of basic disciplines Component of choice																	
D6	Scientific terminology in Biology (in English)	The basic biological laws, the etymology of biological terms, the history of their origin and authorship, the thesaurus of the biologist (lexical minimum), eponyms and bibliographic data of scientists whose names are associated with the names used in various fields of biology. The main technical means of searching for modern scientific and biological information, terminological and conceptual apparatus of basic and specialized biological disciplines.	5				+	+	+							+	
	Theory and practice of scientific communication in biology	Basic models of communication, description of the structure of a communicative act and features of the main types and types of communication: interpersonal, group, and mass; verbal and non-verbal; oral and written. Design and organization of research activities in the information and communication subject environment for teaching biology.					+	+	+								+
D7	Commercialization of the results of scientific and technical activities	The study of the process of commercialization of the results of scientific and intellectual activity. Development of projects focused on the production of highly productive products and the promotion of new technologies. The stages and models, protection of intellectual property objects and rights to their use in the process of commercialization of research results are considered. Theoretical and methodological aspects of drawing up a business plan for commercialization of research results. Attracting investments, introducing developments into production.	5	+						+			+	+			+
	Introduction of scientific research in education into	Creative community of scientists and practical teachers. Ways of introducing the results of scientific research into practice. The specifics and complexity of			+						+			+	+		

	practice	the implementation of the results of scientific and pedagogical research into practice. Criteria for the degree of effectiveness of scientific experience and research. Mechanisms of introduction into practice of scientific research in education and production: domestic and foreign experience.															
D8	Innovative technologies in the course of biology	Introduction. Signs of product innovation. The main consumers of innovative products. Examples of innovative projects in the field of biology. Development of environmentally friendly biopesticides and biofertilizers for agricultural purposes. Modern biosensor systems. Biochips. Industrial innovations in various fields of biology. Practical use of the achievements of biology.	5			+				+			+		+		
	Prospects for the development of biological science	Modern achievements of fundamental biological sciences and biomedical technologies; problems of modern biological science; basic methods of research of biological systems. Actual problems of conservation of the biosphere. Study of biological systems at the present stage of development of natural sciences. Nanotechnology in biology and biomedicine.				+				+		+	+				
Cycle of profile disciplines University component																	
D9	Field research methods	Quantitative accounting of animals in zoological research. Fauna and animal population, the relationship of these concepts. Quantitative accounting as a basis for monitoring the state of natural systems. The importance of quantitative accounting for the compilation of inventories of the animal world. Quantitative accounting as a factual basis of biogeocenology, zoogeography. The role of quantitative accounting in solving applied problems (resources, fisheries, rare species and their protection, etc.). Absolute and relative accounting methods. Choosing the optimal technique.	5	+			+						+	+			
D10	Cytopathology	Pathways of cell pathology and their development, basic concepts and terms used in cytopathology; cell features in pathology, molecular cellular mechanisms of necrosis and apoptosis; theories of carcinogenesis and morphophysiological manifestations of tumor cell transformation, new methodological approaches to biological research.	5										+				

Cycle of profile disciplines																	
Component of choice																	
D11	Evolutionary Biology	Basic theories, concepts and modern principles of evolutionary theories, ways of development and prospects for the preservation of civilization, the relationship of geopolitical and biosphere processes; innovative research methods and methodology of comparative analysis for the consideration of evolutionary phenomena of different scales and at different hierarchical levels of the organization of biosystems. Causes and mechanisms of micro and macroevolutionary processes in forecasting their anthropogenic impact on the course of the evolutionary process.	5									+	+	+			
	Zoological aspects of ecosystem service	Classification of ecosystem services. Products of freshwater ecosystems and hunting farms. Beekeeping and the role of pollinators in the production of agricultural crops. Soil bioproductivity. Regulation of the number of alien and economically important organisms, Genetic resources of species and populations, Aesthetic and cognitive significance of zoological objects.										+	+		+	+	
D12	Wildlife Conservation (in English)	Development of advanced knowledge in the field of biology of nature protection in the context of the study of the basics of inventory, management and protection of endangered species, solutions to the problems of maintaining the evolutionary potential of animal populations. The course examines the concepts of wildlife resources, conservation of diversity, ecological imbalance, faunal collapse, survival thresholds, animal extinction in a broad interdisciplinary context, methods of conservation research and population restoration.	4									+	+		+	+	
	Animals in the global community (in English)	The concept of biodiversity and its role in the system analysis of natural complexes. Optimization of relations with wild fauna; general issues of complex and systematic approaches to the conservation of wildlife, acclimatization measures, repatriation; alien species and regulation of the number of wildlife objects.											+		+		
D13	Cell morphogenesis	Morphology and functional structure of cells, structures and functions of cell organelles. Microscopic methods for studying cells, methods for preparing preparations. The principle of compartmentalization. Membraneology. Biomembranes, structure and main functions. Theory of lipid rafts. Vesicular transport in the cell. Structure of	4			+							+	+			+

		ribosomes and protein synthesis. EPR. Golgi apparatus. Endosomes, types of endocytosis. Cytoskeleton. Lysosomes. Plasmalemma and its derivatives. Cilia. Mitochondria. Kariology, Nucleus, structure, mechanisms of the cell cycle. Cell death, forms. Organization of cells into systems.															
	Genetic and Cellular Engineering	The concepts of plasmids, vectors, restriction, modification enzymes, gene cloning are considered in the course of genetic and cellular engineering. We study the problems of genetic engineering of plants, genetic engineering animals, processes, expression of foreign genes, transformation of bacterial and eukaryotic cells the cloned DNA, determining the sequence of nucleic acids methods of sequencing, application of genetic engineering techniques for gene diagnostic and gene therapy in medicine.			+			+			+		+				+
D14	Modern problems of biology	Familiarization of undergraduates with the most relevant areas of modern biological research and their fundamental aspects of Molecular biology and biochemistry. Modern methods of genome research. Free radical reactions in cells and problems of their regulation. RNA interference: theoretical and practical aspects. Genetics, physiology and medical biology. The problem of consciousness in modern biology. Modern problems of neurobiology. Problems of modern neuroimmunology.	4			+			+			+					+
	Methods and prospects of modern biology	Basic ideas about modern problems and trends in modern biological science; promising and developing areas of modern biological science; formation of basic ideas about the problems of modern biology and ways to solve them.							+		+						
D15	Bioethics	Formation of moral and ethical principles of human interaction with nature, ideas about the legal aspects of bioethics. Objective prerequisites for the emergence and development of bioethics as a scientific discipline. Subject of study and problems of bioethics. Moral principles of attitude to life. Principles, ideas and rules of bioethics as a science. Theoretical foundations of modern bioethics. Bioethics and society. Deontology. The subject and place of bioethics in modern science. Ethical problems of new biomedical technologies.	4						+		+						
	Ethics of biological research	Rules and principles of ethics of biological research. Fundamentals of ethics of scientific research. Control over research. Ethics of biological research and education. Concepts of biological safety in laboratory conditions, basic concepts of biosafety, fundamentals of biomedical ethics,										+	+	+			

		international documents, standard operating procedures for research ethics. Special questions in the study.														
D16	Test objects of the animal world in the bioindication of the environment	Establish the toxicity of the environment with the help of test objects, signaling the danger no matter what substances and in what combination cause changes in vital functions of the test objects. Methods of environmental monitoring in the performance of fundamental and applied research of the environment. Alternative methods of biological testing using different organisms. Test objects: algae, ciliates and crustaceans. Ecology, structure of test objects.	4							+	+					+
	Biomonitoring	The main methods of bioecological monitoring and methods of selecting a suitable indicator; the role of bioaccumulation effect; assessment of water, air, soil quality by bioindication methods; basic methods of zoo-, phyto-indication and indication using microorganisms; methods of selection and analysis of biological samples; types of reactions of living organisms to environmental pollution; private methods of bioindication; principles of bioprognosis of environmental disasters.						+			+	+			+	+
D17	Research practice	Organizational and preparatory stage. The research stage. Preparation and conduct of research on the profile of the master's thesis. Working with electronic databases. Creating a bibliography. Data processing, analysis and specification of results. Preparation of a scientific article and report. Preparation of a report on research practice with the reflection of research materials.	14								+	+	+			

Coordination of the planned learning outcomes with the methods of teaching and evaluation within the module

Learning outcomes	Planned learning outcomes for the module	Teaching methods	Assessment methods
LO1	Demonstrates knowledge of the basic modern epistemological models and approaches of social and humanitarian, natural science, pedagogical and psychological Sciences in higher education and their comparability; knows and understands modern problems of history and philosophy of science, the laws of logical and scientific thinking, the main stages and logic of scientific research.	Round table	Preparation of the poster
LO2	He is able to use the basic provisions and methods of psychology and management in professional activities, applies psychological methods and techniques of regulation in the management sphere and in the field of conflict resolution between the subjects of interaction.	Project training	Presentation
LO3	Analyzes the results of modern research in biology and at the intersection of sciences for self-improvement, conducting independent research and scientific-pedagogical activities and professional mobility.	Case methods	Colloquium
LO4	Fluent in foreign languages at a level that allows effective interaction in the professional and scientific environment, using new information from various English-speaking biological scientific sources in the process of self-continuation of their training and research activities.	Laboratory work	Assessment using computer technology
LO5	Publicly presents the results of their own research in a foreign language, showing the skills of cooperation to improve skills in the global and scientific space, including abroad.	Project training	Presentation
LO 6	He has practical skills, professional competencies and methods of strategic analysis in the field of organization of work on the commercial use of research results and evaluation of commercial potential.	Practical work on educational platforms	Portfolio
LO7	He owns methods and methods of management of innovative activity in the field of biology, demonstrating knowledge of modern trends, trends and patterns of development of domestic science in the context of globalization and internationalization.	Interactive lecture	Testing
LO8	Formulates the provisions of the main modern theories and concepts of evolution to demonstrate his vision of the ways of development and prospects for the preservation of civilization and the connection of geopolitical and biospheric processes.	Discussion	Abstract message
LO9	Chooses the correct ethical position of a specialist biologist when performing his own research using the latest experimental research methods and information technologies in the field of genetics, cellular and evolutionary biology.	Problematic conversation	Control and verification work
LO10	Demonstrates the ability to identify and analyze the essence of the problems arising in the field of management and protection of endangered species and maintain the evolutionary potential of animal populations, and plan a strategy to solve them, based on advanced knowledge in the field of biology of nature protection, modern research methods, methods of regulation and inventory of animals.	Research project	Writing an essay
LO11	Solves problems arising in the course of independent research, scientific and pedagogical, organizational, social and environmental activities, based on an understanding of the peculiarities of animal population management, environmental principles of rational nature management and methods of environmental expertise.	Laboratory work	Assessment using computer technology

LO12	Understands the basic principles of using ICT in scientific research, applies computer methods of analyzing biological systems to solve natural science problems and to conduct evaluation activities and implement modern forms of critical thinking in the digital environment	Research project	Writing an essay
LO13	Evaluates the effectiveness of the results of his own scientific research when writing scientific articles and theses, using the skills of working with personal computing equipment, with graphic editors, with applied computer programs, with databases of natural science.	Laboratory work	Assessment using computer technology
LO14	Evaluates the reliability of scientific results using digital algorithms in order to effectively use the information for further work with the obtained biological data.	Research project	Writing an essay

Criteria for assessing the achievability of learning outcomes

Codes of LO	Criteria
LO 1	Knows: Demonstrates knowledge of the main modern epistemology models and approaches of social-humanitarian, natural science, pedagogical and psychological sciences in higher education and their commensurability; knows and understands modern problems of history and philosophy of science, laws of logical and scientific thinking, the main stages and logic of scientific research.
LO 2	Can: Able to use the basic principles and methods of psychology and management in professional activity, applies psychological methods and techniques of regulation in the management sphere and in the field of conflict resolution between the subjects of interaction.
LO 3	Knows: Demonstrates fundamental knowledge at the intersection of sciences and a high level of academic training to ensure broad horizons and guarantee professional mobility in the developing world.
	Owens: Proficient in methods of solving psychological and pedagogical problems in the educational process of higher education, defining approaches to conducting independent research and scientific and pedagogical activities based on a broad multidisciplinary education, and applying a variety of research methods and modern educational technologies.
LO 4	Owens: fluent in foreign languages at a level that allows effective interaction in the professional and scientific environment, using new information from various English-language biological scientific sources in the process of independently continuing his studies and carrying out research activities.
LO 5	Can: Publicly presents the results of his own scientific research in a foreign language, showing the acquired skills of cooperation for professional development in the world and scientific space, including abroad.
LO 6	Owens: Possesses practical skills, professional competencies and methods of strategic analysis in the field of organizing work on the commercial use of research results and conducting an assessment of commercial potential.
LO 7	Owens: Proficient in methods and methods of managing innovation activities in the field of biology, demonstrating knowledge of current trends, trends and patterns of development of domestic science in the context of globalization and internationalization.
LO 8	Knows: Knows and understands the basic theories, concepts and modern principles of evolutionary theories, ways of development and prospects for the preservation of civilization, the connection of geopolitical and biospheric processes, innovative research methods and comparative analysis methodologies for considering evolutionary phenomena of different scales and at different hierarchical levels of the organization of biosystems.
LO 9	Can: Able to plan and implement professional activities using various aspects of achievements in the field of genetics, cellular and evolutionary biology, understanding the importance and necessity of solving moral and ethical problems arising in the process of applying his knowledge and understanding at a professional level. He is able to analyze cytopathological mechanisms of cell biology, possess and reproduce cytological research methods in clinical laboratory diagnostics and in oncology.
	Owens: Carries out the correct ethical position of a biologist within the framework of interdisciplinary research arising in connection with the progress of biological science and the introduction of the latest experimental research methods and information

	technologies.
LO 10	Owens: Demonstrates the ability to identify and analyze the essence of the problems arising in the field of management and protection of threatened species and the maintenance of the evolutionary potential of animal populations, and plan a strategy to solve them, relying on advanced knowledge in the field of conservation biology, modern research methods, methods of regulation and inventory of animals.
LO 11	Knows: Demonstrates in-depth professional knowledge on animal population management, practical implementation of environmental principles of rational nature management, and environmental expertise
	Can: Able to solve problems arising in the course of independent research, scientific and pedagogical, organizational, social and environmental activities.
	Owens: Uses the results of the work to write scientific articles, theses, participate in conferences, symposiums, summer schools, round tables and discussions
LO 12	Knows: Knows and understands the basic principles of using ICT in conducting scientific research
	Can: Uses computer methods of analysis of biological systems to solve natural science problems and to conduct evaluation activities and implement modern forms of critical thinking in a digital environment
LO 13	Can: Sets research goals for emerging production tasks, selects solutions and means of self-development using digital technologies.
	Owens: Uses the skills of working with personal computing equipment with standard means of viewing and processing text and graphic information, with graphic editors, with general technical applied computer programs, with global networks and databases of natural science
LO 14	Can: Manages information and biological data, finds the necessary sources of scientific information
	Owens: Perceives, analyzes and transmits information using digital means, as well as using digital algorithms when working with the obtained biological data in order to effectively use the information obtained for scientific and industrial tasks.

Graduate Attributes

High professionalism in the implementation of the educational process in biology; Emotional stability, High intelligence
Adaptability to the global challenges of the modern world, Leadership, Strong citizenship, Understanding of the importance of principles and culture of academic integrity

Form 8

The graduate model of the educational program

Types of competencies	Description of competencies
1 Behavioral skills and personal qualities (Soft skills)	Capable of positive cooperation; shows flexibility of perception and comfortable alignment of priorities; is fluent in verbal communication, academic writing skills; strives to encourage cooperation and stimulating communication to achieve common goals; builds professional relationships based on respectful interpersonal contacts; uses professional skills for team building, personal development and innovation, people and information management, applies analytical thinking, strategic approach and foresight
2 Digital competencies (Digital skills)	Capable of use the skills of working with personal computing equipment, standard means of viewing and processing text and graphic information, with graphic editors, with general technical applied computer programs, perform statistical processing of the obtained biological data using digital algorithms and models. Owns ICT methods for conducting scientific research, he is able to use computer methods of collecting and analyzing biological data to solve natural science problems, conduct evaluation activities and implement modern forms of critical thinking in a digital environment. He is able to use digital tools for corporate training, search for sources of scientific information, management of information about biological data in the structure of global information networks on biodiversity, monitoring, landscape mapping and forecasting.
3 Professional competencies (Hard skills)	Capable of apply the theoretical foundations and achievements of natural sciences to improve the basic and specialized level of knowledge; to carry out observations of processes and research in biological systems at all levels of the organization of life; has the basics of scientific planning, analysis and evaluation of the results of observations and experiments. He is able to assess the environmental, moral, ethical and socio-economic consequences of his actions during biological experiments. Understands the causes of ecological imbalance and the strategy of environmental protection. Possesses the skills of organizing and managing research activities in accordance with global trends in the development of biological science.

Developers:

Members of the working group:

Head of the Department of Zoology

Associate Professor of the Department of Zoology, Candidate of Biological Sciences.

Associate Professor of the Department of Zoology, Candidate of Biological Sciences.

Lecturer of the Department of Zoology

Master's student of MBN-61 group

Master's student of MBN-53 group

Deputy Director of the KGKP "Karaganda State Zoological Park"

A.J. Shaibek
V.S. Abukenova
A. B. Eshmagambetova
Zh. Zh. Blyalova
S. Assan
B. Turar
E.T. Baizhanov

The educational program was reviewed by the Faculty Council from 15.03.2014 protocol No. 8
The educational program was reviewed at the meeting of the Academic Council from 28.04.2014 protocol No. 5
The educational program was reviewed and approved at the meeting of the University Board from 26.05.2014 protocol No. 12

Board Member-Vice-Rector for Academic Affairs
Director of the Academic Work Department
Dean of the Faculty of Biology and Geography

T. Z. Zhussipbek
G.S.Akybayeva
S.A. Talzhanov