

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

«APPROVED»
Chairman of the board -
Rector _____
Doctor of historical sciences,
Academician, Kozhamzharova D.P.
«___» _____ 2023

EDUCATION PROGRAMME

7M05110 - Biology

Registration Number	7M05100008
Code and Classification of Education	7M05 Natural Science, mathematics and statistics
Code and Classification of Areas of Training	7M051 Biological and related sciences
Group of educational programs (EP)	M080-Biology
Type of EP	acting
ISCE level	7
NQF level	7
IQF level	7
Language of learning	Kazakh, Russian
The complexity of the EP, not less	120 credits
Distinctive features of EP	-
Partner University (JEP) -	-
University partner (DDEP) -	-
Social Partner (DE)	-

Shymkent, 2023

Developers:

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The EP was considered in the direction of training on Natural Sciences, Mathematics and Statistics at a meeting of the academic committee, Minutes № _____ «_____» _____ 2023 y.

Chairman of the Committee _____ Madiyarov N.K.

The EP was considered and recommended for approval at Educational-methodical meeting of M.Auezov SKU
Minutes № _____ «_____» _____ 2023 y.

Chairman of the UMS _____ Abisheva R.D.

The EP was approved by the decision of the Academic Council of the University
Minutes № _____ «_____» _____ 2023 y.

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1 CONCEPT EP

Mission of the University	We are focused on generating new competencies, training a leader who translates research thinking and culture.
University Values	<ul style="list-style-type: none"> – Openness - open to change, innovation and cooperation. – Creativity - generates ideas, develops them and turns them into values – Academic freedom - free to choose, develop and act. – Partnership - creates trust and support in a relationship where everyone wins. – Social responsibility - ready to fulfill obligations, make decisions and be responsible for their results.
Graduate Model	<ul style="list-style-type: none"> – Deep subject knowledge, their application and continuous expansion in professional activity – Information and digital literacy and mobility – Research skills, creativity and emotional intelligence – Entrepreneurship, independence and responsibility for their activities and well-being – Global and national citizenship, tolerance to cultures and languages
Uniqueness of the EP	the program was developed in accordance with the Atlas of New Professions and Competencies, and is aimed at training competent specialists for transport and logistics and scientific and pedagogical structures who are able to organize and manage the activities of a structural enterprise, independently determine the goals of professional activity, choose and justify methods and means to achieve them.
Academic Integrity and Ethics Policy	<p>The University has taken measures to maintain academic integrity and academic freedom, protection from any kind of intolerance and discrimination:</p> <ul style="list-style-type: none"> • Rules of academic integrity (Order No. 212-ҢК dated 10.10.2022); • Anti-Corruption Standard (Order No. 221-ҢК dated 07.12.2021). • Code of Ethics (order No. 212-ҢК dated 10.10.2022). • Anti-Corruption Policy of the NJSC “M. Auezov South Kazakhstan University.” (order No. 144 нк dated 07.14.2022).
Regulatory and legal framework for the development of EP	<ol style="list-style-type: none"> 1. Law of the Republic of Kazakhstan "On Education" No. 319-III dated July 27, 2007; 2. Standard rules of activity of educational organizations implementing educational programs of higher and (or) postgraduate education, approved by Order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 30, 2018 No. 595 3. State obligatory standards of higher and postgraduate education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated July 20.2022 No. 2; 4. Rules for the organization of the educational process on credit technology of training, approved by the Order of the Ministry of Education and Science of the Republic of Kazakhstan dated April 20, 2011 No. 152; 5. Qualification directory of positions of managers, specialists and other employees, approved by the Order of the Minister of Labor and Social Protection of the Population of the Republic of Kazakhstan on December 30, 2020 No. 553. 6. Guidelines for the use of ECTS. 7. Guidelines for the development of educational programs of higher and postgraduate education, Appendix 1 to the order of the Director of the Central Research Institute No. 45 o/d dated June 30, 2021.
Organization of the educational process	<ul style="list-style-type: none"> – Implementation of the principles of the Bologna Process – Student-centered learning – Availability – Inclusivity

Quality assurance of EP	<ul style="list-style-type: none"> – Internal quality assurance system – Involvement of stakeholders in the development of the EP and its evaluation – Systematic monitoring – Updating the content (updating)
Requirements for applicants	<p>They are established according to the Standard Rules of admission to training in educational organizations implementing educational programs of higher and postgraduate education Order of the Ministry of Education and Science of the Republic of Kazakhstan No. 600 dated 31.10.2018</p>
Conditions for the implementation of educational programs (EP) for persons with disabilities and special educational needs(SSN)	<p>For students with SEN (special educational needs) and persons with disabilities (PSI), tactile PVC tiles, specially equipped toilets, a mnemonic diagram, and shower bars have been installed in educational buildings and student dormitories. Special parking spaces have been created. Crawler lift installed. There are desks for people with limited mobility (PLM), signs indicating the direction of movement, ramps. In the educational buildings (main building, building No. 8) there are 2 rooms with six working places adapted for users with disorders of the musculoskeletal system (DMS).For visually impaired users, the SARA™ CE Machine (2 pcs.) is available for scanning and reading books. The library website is adapted for the visually impaired. There is a special NVDA audio program with a service. The JIC website http://lib.ukgu.kz/ is open 24/7.</p> <p>An individual differentiated approach is provided for all types of classes and in the organization of the educational process.</p>

2 PASSPORT of the educational program

Purpose of the EP	Preparation of highly qualified masters with in-depth scientific and pedagogical knowledge, able to plan and carry out scientific, pedagogical and industrial activities in various branches of biology.
Tasks of the EP	providing conditions for the acquisition of a high intellectual level of development, mastering logical and critical thinking and skills of scientific organization of labor in scientific and pedagogical activity; - development of the ability to use the acquired knowledge in professional activities to solve scientific problems, operational decision-making in problem situations; -creation of conditions for intellectual, physical, spiritual, aesthetic development to ensure the possibility of their employment in the specialty or continuing education at subsequent levels of education.
Harmonization of EP	<ul style="list-style-type: none"> • 7th level of the National Qualifications Framework of the Republic of Kazakhstan; • Dublin descriptors of the 7th level of qualification; • 2 cycle of a Framework for Qualification of the European Higher Education Area; • 7th Level of European Qualification Framework for Lifelong Learning.
Connection of the EP with the professional sphere	The sectoral qualifications framework 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.
Name of the degree awarded	After the successful completion of this EP, the graduate is awarded the degree of Master degree in natural sciences "7M05110 – Biology "
List of qualifications and positions	<ul style="list-style-type: none"> -teacher; - research associate; -head of the organization
Field of professional activity	<ul style="list-style-type: none"> education; - science; -nature protection and environmental management bodies; - entrepreneurial.
Objects of professional activity	<ul style="list-style-type: none"> -biological systems of various levels of organization; - the processes of their vital activity and evolution; - biological, bioengineering, biomedical, environmental technologies; - biological expertise and monitoring, assessment and restoration of territorial biological resources.
Subjects of professional activity	<ul style="list-style-type: none"> -educational process; -biological objects and processes in biological systems of various levels of organization - biological environmental technologies
Types of professional activity	<ul style="list-style-type: none"> - scientific research; - organizational and managerial; - pedagogical
Learning outcomes	<p>RO1 Use a foreign language in interpersonal communication, professional activity, when communicating with both specialists and a wider circle of people.</p> <p>RO 2 Analyze the main ideological and methodological problems, including interdisciplinary ones, arising in science at the present stage of its development, evaluate various facts and phenomena based on the provisions and categories of the philosophy of science.</p>

	<p>RO 3 Evaluate the development and effective use of personnel in the organization, possess socio-psychological technologies for managing mass behavior.</p> <p>RO 4 Apply effective teaching methods in the field of biology, critically evaluate the scientific organization of the work of a higher school teacher.</p> <p>RO 5 Apply modern trends in the development of biology in the world and Kazakhstan, reveal the most effective directions in biological science, independently assess key problems in the field of biology.</p> <p>RO 6 analyze the main methodological problems arising in biological science at the present stage and in their historical development;</p> <p>RO 7 formulate innovative proposals for solving non-standard tasks using in-depth general scientific and special biological theoretical and methodological training.</p> <p>RO 8 it is reasoned to substantiate their views on modern problems of biology and the principles of solving current research problems based on the use of modern equipment and computing facilities.</p> <p>RO 9 Independently carry out experimental research in interdisciplinary related fields of biology, substantiate research results when discussing with specialists and a wider audience.</p> <p>RO 10 Possess methods of biological cognition and technologies for planning solutions to fundamental professional tasks in the field of scientific biological research.</p>
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3 COMPETENCES OF THE GRADUATE OF EP

SOFT SKILLS. Behavioral skills and personality qualities	
SS 1. Competence in managing one's own literacy	SS1.1. The ability of self-learn, self-develop and constantly update their knowledge within the chosen trajectory and in an interdisciplinary environment. SS1.2. The ability to express thoughts, feelings, facts and opinions in the professional field. SS1.3. The ability for mobility in the modern world and critical thinking.
SS 2. Language competence	SS2.1. The ability to build communication programs in the state, Russian and foreign languages. SS2.2. The ability for interpersonal social and professional communication in the conditions of intercultural communication.
SS 3. Mathematical Competence and Competence in the field of Science	SS3.1. The ability and willingness to apply the educational potential, experience and personal qualities acquired during the study of mathematical, natural science, technical disciplines at the university to solve professional problems.
SS 4. Digital competence, technological literacy	SS4.1. The ability to demonstrate and develop information literacy through the mastery and use of modern information and communication technologies in all areas of their lives and professional activities. SS4.2. The ability to use various types of information and communication technologies: Internet resources, cloud and mobile services for searching, storing, protecting and disseminating information.
SS 5. Personal, social and academic competencies	SS5.1. The ability for physical self-improvement and focus on a healthy lifestyle to ensure full-fledged social and professional activities through the methods and means of physical culture. SS5.2. The ability to social and cultural development based on the manifestation of citizenship and morality. SS5.3 The ability to build a personal educational trajectory throughout life for self-development, career growth and professional success. SS5.4. The ability to successfully interact in a variety of socio-cultural contexts during study, work, home and leisure.
SS 6. Entrepreneurial competence	SS6.1. The ability to be creative and entrepreneurial in a variety of environments. SS6.2. The ability to work in a mode of uncertainty and rapidly changing task conditions, make decisions, allocate resources and manage your time. SS6.3. The ability to work with consumer requests.
SS 7. Cultural awareness and ability to express yourself	SS7.1. The ability to show worldview, civil and moral positions. SS7.2. The ability to be tolerant of the traditions and culture of other peoples of the world, to have high spiritual qualities.
PROFESSIONAL COMPETENCE (PC)	
PC1 scientific research	PC1.1 The ability to creatively use knowledge of fundamental and applied sections of biology in scientific and technological activities using the latest domestic and foreign experience.
PC2 scientific and innovative	PC2.1 The ability to apply the methodological foundations of design, implementation of field and laboratory, biological, physiological and medical research, use modern equipment, computer systems in accordance with the direction of the master's program.
PC3 organizational and managerial	PC3.1 The ability to plan and carry out activities to assess the state and protection of the environment, to organize activities for the rational use of natural resources, assessment and restoration of biological resources; PC3.2 Assessment and restoration of biological resources; PC3.3 To organize scientific seminars and conferences; the ability to use the skills of preparation and design of scientific and technical documentation, scientific reports, reports and articles.

PC4 pedagogical and educational	<p>PC4.1 The ability to methodically competently make plans for lectures and practical training in the sections of academic disciplines and publicly present the theoretical and practical sections of academic disciplines in accordance with the approved teaching AIDS;</p> <p>PC4.2 To possess the skills and abilities of designing and implementing a holistic pedagogical process, to be able to positive thinking, attached to the system of national values, committed to ethical values, prone to humanism and optimism;</p> <p>PC4.3 To possess Kazakh, Russian, foreign languages, knowledge in the field of biology, pedagogical rhetoric and conflictology, communication strategies, skills and constructive dialogue, communication in a multicultural, multiethnic and multi-confessional society, to be tolerant and capable of pedagogical cooperation.</p>
PC5 innovation and design	<p>PC5.1. The ability to use innovative solutions in the development of new technologies, the ability to assess innovative business risks in the implementation of new solutions in the field of technology development for various fields of activity;</p> <p>PC5.2. The ability to develop plans and programs for the organization of innovative activities of research teams.</p>

3.1 Matrix mapping of learning outcomes at the EP in general, generated by the competence modules

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10
SS 1	+									
SS 2		+							+	
SS 3			+							
SS 4				+		+				
SS 5					+					
SS 6								+		
SS 7							+			+
PC1	+					+				
PC2				+			+			
PC3			+							+
PC4		+						+		
PC5					+				+	

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

The name of the module	Cycle	Component	Component name	Short description of the discipline	Number of credits	The generated RO (codes)												
						RO1	RO2	RO3	RO4	RO5	RO6	RO7	RO8	RO9	RO10			
Module Scientific and Pedagogical Training			History and Philosophy of Science	<p>Purpose: Study of the problems of the phenomenon of science as a subject of special philosophical analysis, patterns and trends in the development of special activities for the production of scientific knowledge taken in a socio-cultural context.</p> <p>Identification of the specifics and relationship of the main problems of history and philosophy of science. Study of the laws of the development of science and the structure of scientific knowledge, methods of scientific research.</p> <p>Knowledge of the main concepts and directions of the non-classical and post-classical stage of the development of science. Analysis of the realities of modern theory and practice based on understanding the methodology of natural science, socio-humanitarian and technical knowledge. Critical thinking as a prerequisite for the development</p>	4		✓											

			and functioning of modern society. Technologies for the development of critical thinking: consideration and study of the logic of arguments. Formation of critical reflexive thinking and metacognitive abilities.												
		Foreign Language (Professional)	The aim is systemic deepening of communicative competence within the framework of foreign language education's international standards based on the further skills and abilities' active language proficiency development in the professional activities of the future master's student The contents. Levels B2, C1 are presented in the form of a pragma-professional orientation for professional and academic aims at an advanced level: scientific information base, interpretation of scientific information, argumentation, persuasion, scientific controversy, academic writing. Use of innovative methods and technologies, and attraction of modern means (Internet resources). Demonstration of language material's knowledge in any related discipline	4	✓										
		Psychology of Management	Purpose: to ensure the competence of a psychologist by mastering his knowledge in the	4			✓								

				<p>field of psychological management, developing skills in managing the organization's human resources.</p> <p>Content: methodological foundations of management psychology. Development of psychological theories of management. General theoretical questions of management psychology. Psychology of managerial communication. Psychological characteristics of the staff. Psychology of employee motivation. Technologies of human resource management of the organization. Psychological support of the personnel policy of the organization. Psychology of conflict in the organization. Technologies for preventing professional deformation of personality. Practical implementation in the form of creating diagnostic tools, developing digital methods for training leaders, and management consulting.</p>											
			Higher School Pedagogy	<p>The aim: formation of the foundations of the professional and pedagogical culture of a university teacher, general pedagogical competencies, familiarization of undergraduates with the</p>	4				✓						

				<p>theoretical and methodological foundations of higher education pedagogy, technologies for planning, organizing and managing the educational process at a university.</p> <p>Content. Modern paradigms of education, history and latest trends in the development of higher professional education in the world and in Kazakhstan.</p> <p>Genesis and methodology of pedagogy of higher education, the competence of a university teacher. Problems of university didactics, problems of organizing educational work with students, management of a modern university. Modern approaches and methods of teaching and organization of educational activities of students, evaluation of educational achievements.</p>										
Module Methodical Basics of Teaching			Teaching Methods of Special Disciplines	<p>Purpose: Formation of professional and pedagogical competence and methodological preparation of undergraduates for future pedagogical activity in new socio-economic conditions.</p> <p>Content: Features of the construction of goals, content, application of modern methods, methodologies and organizational forms of teaching specialized disciplines. Methods of</p>	5			✓						

			organizing and conducting various types of classes. Development of course programs, methodological support of specialized disciplines. Methods of organizing and conducting quality control and training in special disciplines at the university												
		Pedagogical Practice	Purpose: Mastering pedagogical skills, formation of skills of independent teaching and educational activities in higher education. Content: Study of teaching experience by leading university teachers. Independent conduct of training sessions, management of research work of students. The use of skills for collecting and accumulating empirical material, structuring, systematizing knowledge and presenting it in various ways. Improving the skills of public speaking and presentation of accounting documentation.	4				✓							
Scientific and Technological Module		Scientific Advances in Recent Years in the Field of Biology	The purpose is to familiarize with the latest trends in the development of biology at the present stage, to highlight the main directions of its development, to introduce new sciences, the subject of their research, the history of their origin, practical application and	4					✓						✓

			<p>significance of each direction at present and in the future.</p> <p>Content</p> <p>Objective knowledge of the latest scientific achievements in the field of biology. Current trends in the development of biological science in the world. Synthetic biology, "Nanoscience", Bionics. Nutrigenomics and nutrigenetics. Memetics, recombinant memetics. Neuroeconomics. Sociology. Quantum biology. Neuroparasitology</p>												
		Modern State of Biological Sciences Development in the RK	<p>The purpose of the course is to provide objective knowledge about the history and current state of biological science in the Republic of Kazakhstan.</p> <p>Content. Overview of the history and status, main directions, trends and prospects for the development of biological science in the Republic of Kazakhstan. The role of domestic scientists in the formation and development of biological science in Kazakhstan. The role of the Academy of Sciences, educational and scientific centers in the development of biological science in Kazakhstan.</p>	4						✓					
		Current Issues of Specially Protected Natural Areas	<p>Purpose: formation of ideas about the modern problems of specially protected natural areas, including</p>	6						✓					

			<p>anthropogenic and biospheric aspects.</p> <p>Content: Problems of OOPR. National peculiarities and their connection with the specifics of nature, history, mentality of the population, scientific traditions. Similarities and differences in the organization of protected areas in different countries. Preservation of the diversity of cultural landscapes, natural landscapes, biological species and other natural objects.</p> <p>Legislative and regulatory documents in the field of environmental protection and biodiversity conservation.</p>											
		Nature Reserve RK	<p>Goal. To give an idea of the basic principles and legislation of protection on the basis of scientific analysis of the features of the creation of specially protected natural territories in Kazakhstan and species of rare plants and animals.</p> <p>Content. Protection of flora and fauna in Kazakhstan. Problems of functioning of protected areas from the point of view of the impact of economic activity on the state of protected ecosystems. The problem of preserving unique landscapes, standards of untouched biogeocenoses, species diversity of living organisms (gene</p>	6								✓		

			pool). Protection of rare and endangered relict and endemic (local) species, providing the necessary conditions for their reproduction. Biosphere reserves. Natural monuments. Nature reserves. National parks. Nature reserves of Kazakhstan												
		Micro and Macrophytes	<p>Purpose: Formation of knowledge of biodiversity and structural features of aquatic lower and higher plants.</p> <p>Contents: Groups of macrophytes. Species composition of aquatic plants, features of the life cycle. Systematics of aquatic plants, features of the structure of aquatic plant tissues. Adaptation of aquatic plants to the habitat, features of the life cycle and reproduction. Characteristic features of representatives of the departments of algae, higher aquatic plants. Indicators of pollution of the aquatic environment species, the importance of aquatic plants for water bodies and their role in aquatic ecosystems.</p>	4							✓				
		Algology	<p>Purpose: to deepen knowledge in the field of botany and develop practical skills of independent research work. Contents: Features of the structure of algae cells, classification and main groups. The main types of algae life</p>	4							✓				

				cycles. Types of morphological differentiation of algae thalloma. Types of reproduction and life cycles of algae. Changing forms of development and nuclear phases. Ecological groups and algae ecology. The role of algae in nature and their practical significance. Methods of collecting and studying algae Microscopy technique and method of preparation of temporary algae preparations.												
			Information Biology	Objective: to form a holistic view of information, the specifics of information processes in biological and ecological systems, to gain experience in applying information approaches to the analysis of biological objects, processes and systems. Content: Scientific and informational activity in biology and ecology. Information systems in biology and ecology. information approaches (semantic, biocybernetic, semiotic) to the analysis of biological and ecological processes and systems. Biodiversicology, informational aspects of studying the structure and dynamics of biological diversity. Information indexes. Computer biology. Information technologies for data analysis and	5								✓			

				documentation of biological and environmental research results											
			Genomics	<p>Purpose: Formation of knowledge about the structure and functioning of the genome, about scientific and applied aspects of the use of molecular genetics</p> <p>Contents: Methods of genomics. Functions and evolutions of genomes. Determination of the complete genetic characteristics of the entire cell. Structural and functional genomics. General principles of geological mapping and their functions outside the elements of genes. Sequencing, mapping. Heredity and variability, inheritance of traits, mutational variability. The sequence of chromosome abnormalities, heredity of genetic diseases. The future of genomics.</p>	5							✓			
Research Methodology Module			Research Practice	<p>Objective: To consolidate the acquired theoretical knowledge and acquire practical skills and experience to identify and formulate a scientific problem, its research and substantiation of solutions.</p> <p>Content: Organization of scientific research in accordance with the modern methodology of science, compliance with the stages and logic of scientific research in accordance with the applied tasks of the master's</p>	6								✓		✓

			project. Develops the ability to experiment and summarize the results of research work in the form of scientific publications, defend their position during the discussion and make professional decisions. Develops creativity, creativity and initiative.												
		Landscape Design and Greening	<p>Purpose: formation of a system of theoretical knowledge and practical skills for creating landscape compositions and their use in interiors and open environmental situations, formation of microclimate, image improvement</p> <p>Contents: theoretical and practical foundations of landscape design. Landscaping based on the analysis of natural, social and economic factors. Rational methods, techniques and means of landscape design. Relief, artificial reservoirs and small forms as integral components of the architectural landscape. Scientific and methodological foundations of modern landscape design. Principles and main stages of landscape planning. Classification of landscape plans and features of their structure.</p>	5									✓		
		Urbanoflora	Goal. Familiarity with the specifics of plant habitat conditions in the urban	5							✓				

			<p>environment, the peculiarities of urban flora and vegetation.</p> <p>Content. Features of urban flora in connection with their rational use and protection. Light and temperature conditions in the city.</p> <p>Soil environment: compaction, specificity of microbiological processes. Conditions of mineral nutrition of plants in the city.</p> <p>Pollution of the environment and plants. Recreation and plants. The influence of the urban environment on the physiological processes of plants and their morphology. The specifics of the composition and structure of urbanophytocenoses. The role of urban flora in solving environmental problems. Phyto-indications of the state of the environment in the urban environment.</p>											
		Biological Monitoring of Environment	<p>Purpose: formation of knowledge about the system of observations of biological objects, which allows to identify changes in the state of the biosphere under the influence of human activity.</p> <p>Contents: Biological monitoring is a priority method of modern environmental monitoring.</p> <p>Principles of monitoring. General monitoring structure.</p> <p>Classification of types of monitoring. Monitoring of impact</p>	6								✓		

				factors - physical, chemical, biological factors; monitoring of the state of the biosphere - geographical monitoring (atmosphere, ocean, land surface with rivers and lakes) and biological monitoring. Monitoring of the state of impact factors and the environment; forecasting and assessment of the forecast state. Environmental monitoring programs, their application in monitoring.												
			Environmental Problems of Plant and Animal world of Kazakhstan	<p>Purpose: formation of knowledge about environmental problems, diversity of flora and fauna of Kazakhstan and effective ways to solve them.</p> <p>Content: environmental problems of Kazakhstan. Qualified implementation of practical activities for environmental protection and sustainable development in the republic. Normative documents of domestic and foreign policy in the field of protection and use of the natural environment.</p> <p>Biodiversity of plants and animals of Kazakhstan. Biospheric importance of biodiversity conservation. The impact of human activities on biodiversity. Endemic and rare plants, animals of Kazakhstan. Measures to protect them. Preservation of the</p>	6								✓			

			gene pool of plants and animals of Kazakhstan.												
		Biodiversity and Protection of the RK Animal World	Goal. familiarity with the biodiversity of the animal world: systematics, morphology, species composition, reproduction, geographical distribution. Content. Biological diversity and sustainable use of animal resources. Specially protected natural areas and biodiversity. Methods for assessing the state of animal resources and ways to restore them. Methods for assessing the state of animal resources and ways to restore them. Threats to the biodiversity of animal species. Regulatory and legal framework for the conservation of fauna biodiversity both at the regional level and at the level of the republic and the world community.	6						✓					
		Plant and Animal Resources of the RK, Rational Use, Protection	Goal. To give an idea of the methods of determining the state of plant and animal resources in the Republic of Kazakhstan, ways of their restoration and rational measures for their effective use. Content. The state of plant and animal resources of Kazakhstan, the structure and levels of biodiversity, flora and fauna. Possibilities of protection and rational use of plant and animal	6								✓			

				resources of the Republic of Kazakhstan. Methods for assessing the state of plant and animal resources and ways to restore them. Sustainable use of animal and plant resources. Ecosystem change from human action. Specially protected natural areas and biodiversity.											
Applied Aspects of Modern Biology			Actual Problems of Modern Biology	<p>The purpose is to consider the current problems of modern biology and promising areas of development of biological research.</p> <p>Content: Modern views on the origin of life. Genetic and molecular bases of gene regulation in animals and plants. Questions of developmental biology, behavioral biology. The main problems of evolution and patterns of biological phenomena. Interdisciplinary approach to understanding the essence of biological patterns in Nature. Viral evolution in the era of the genome. Evolution, interactions and biological networks. Balancing sustainability and evolutionability. Cooperation between microorganisms.</p>	5					✓					
			Modern Methods of Biological Researches	Purpose: Consideration of the main research methods in biology, with specific methods for studying natural quasi-natural	5						✓				

			<p>biological systems and their components, the formation of theoretical foundations and the development of practical skills, techniques, research in the field of biology</p> <p>Content: Structure and organization of biological research. Means and methods of scientific research.</p> <p>Comparative research method. Methods of faunal studies of invertebrates. Methods of research of plant organisms. Methods of geobotanical research. Morphological study and description of plants. Methods of research of animal organisms. Microscopy as a method of studying cells and tissues: light and electron microscopy. Methods of research of living cells. Methods of cell and tissue research. Molecular research methods.</p>												
		Cell Membrane	<p>Purpose: formation of knowledge about modern models of cell membrane structure and mechanisms of functional activity.</p> <p>Contents: modern models of the structure of membranes and membrane systems of cells of living organisms. Classification, evolution, functions of membranes. Biochemical</p>	6							✓				

			<p>features, patterns of metabolic processes in membranes. A layered model of the membrane. Liquid-mosaic structure. The function of cell membranes. Barrier, selective, passive and active metabolism. Matrix, mechanical, receptor, energy functions of membranes. Surface receptors. Energy transfer systems in the membrane. Biopotentials. Enzymatic function, recognition function. Immune function. Intercellular relationships. Transmembrane glycoproteins. Histocompatibility Changing the state of the membranes.</p>												
		Cell Biology	<p>Purpose: To provide the theoretical and practical foundations of scientific methods for analyzing the morpho-functional features of the cell as a structural unit of all living things. Contents: cell theory, Modern trends and prospects for the development of cell biology. Molecular biology of the cell, structural and functional organization and mechanisms of regulation of genome expression. Mechanisms of autoregulation and adaptation of cells. Proliferation and differentiation, integration of cells in various organisms, intercellular interactions. Features</p>	6						✓					

			of the structure and physiology of stem cells, their role in the vital activity of the body. Light and electron microscopy. Cell culture, cytogenetic methods, isolation and investigation of intracellular structures, PCR, ELISA, sequencing methods.												
		Chronobiology	<p>Purpose: formation of knowledge about cyclic processes in biological systems of different levels of organization</p> <p>Contents: basic concepts of biological rhythms.</p> <p>Methods of chronobiology. The problem of biological time. Time series. Time series analysis. A person's sense of time in the historical aspect. Rhythmic structure of the habitat. The cyclical nature of the movement of celestial bodies. Diagram of the Solar system. Cosmic rhythms in the biosphere. Dynamics of the ozonosphere and variations of the surface</p> <p>ultraviolet radiation. The comparability of biological rhythms with the rhythms of the habitat. Adaptive role of circadian rhythms. Seasonal rhythms. Biological circadian clock. Regulators of circadian biological rhythms. Time sensors. Desynchronization.</p>	5							✓				

		Basics of plant introduction and acclimatization	<p>Purpose: formation of the ability to use methods and techniques of introduction and acclimatization of plants in practical activities</p> <p>Content: Introduction and acclimatization. Naturalization of plants. Genetic bases of plant introduction and acclimatization. Methods of preliminary selection of introducers. A method of comparative study of paleoareas and modern areas of introduced species. The phlorogenetic method of selecting Sobolevskaya introducers. The method of accounting for the experience of acclimatization of Aurorin. The method of studying introducers in the nature of Kucherov. Phenology. Phenophase and the stages of its manifestation. Phenological observations and their mathematical and graphical processing. Organization of introduction observations and assessment of the success of the introduction.</p>	5										✓	
		Biogeocenology	<p>Purpose: formation of a complex of knowledge about the patterns of diverse relationships and interactions that determine the life and productivity of biogeocenoses.</p> <p>Contents: Analysis of the geoecological features of plants and animals. Similarities of</p>	5							✓				

				<p>borders of large floristic and faunal zones in Kazakhstan. Problems of biogeocenology. Stages of development of modern biogeocenological research. Classification of biocenoses. Center of origin of cultivated plants. Division of flora and fauna into zones, floristic and faunal regions or kingdoms. International programs on biological diversity.</p>											
			Biometrics	<p>Objective: to develop the ability to plan and process the results of quantitative experiments and observations by methods of mathematical statistics. Contents: Basic concepts of biometrics. Grouping of primary data. The main characteristics of varying objects. Application of mathematical and statistical methods in biology. The laws of distribution. Sampling method and estimation of general parameters. Analysis of variance. Correlation analysis. Regression analysis. Criteria for the reliability of estimates. Statistical hypotheses and their verification. Issues of research planning.</p>	5								✓		
Module of scientific-research work and Final Certification			Research work of a master student, including passing an	Independent scientific search and solution of specific scientific problems on the topic of the selected research. Analysis and use of modern theoretical,	24										✓

		internship and completing a master's thesis	methodological, technological achievements of biological science. Familiarization with innovative technologies as part of the internship. The use of modern research methods. Conducting an assessment of the reliability of the results obtained and critically comparing them with similar results of domestic and foreign works. Analysis of the results, conclusions and suggestions.											
		Execution and Defense of Master`s Thesis	Objective: assessment of the achieved learning outcomes and mastered competencies upon completion of the study of the educational program Content: preparation of the dissertation in accordance with the requirements for master's theses. Accounting for academic integrity requirements (plagiarism). Public defense with demonstration of formed knowledge, skills and competencies.	8										✓

5 A SUMMARY TABLE SHOWING THE VOLUME OF CREDITS IN THE CONTEXT OF THE MODULES OF THE EDUCATIONAL PROGRAMME

Training course	Semester	Number of modules to be mastered	Number of subjects studied							Total hours	Total credits KZ	Number	
			VC	EC	Theoretical training	Pedagogical practice	Research. practice	Research work of a master's degree student	Final certification			exam	Differentiated credit
1	1	3	5	2	29		-	1	-	900	30	6	2
	2	3	1	4	22	4		4	-	900	30	4	2
2	3	3		2	11		6	3	-	600	20	2	2
	4	1		3	16		-	4	-	600	20	3	1
	5							12	8	600	20		1
total			6	12	78	4	6	24	8	3600	120	13	8

6 LEARNING STRATEGIES AND METHODS, MONITORING AND EVALUATION

Learning strategies	Student centred Approach in Education: learner – teaching center / learning and an active participant in the learning and decision-making process. Practice-oriented training: orientation to the development of practical skills.
Teaching methods	<p>Conducting lectures, seminars, various types of practices:</p> <ul style="list-style-type: none"> • using innovative technologies: <ul style="list-style-type: none"> problem-based learning; case study; work in a group and creative groups; discussions and dialogues, intellectual games; reflection methods, Bloom's taxonomies; presentations; • rational and creative use of information sources: <ul style="list-style-type: none"> multimedia training programs; electronic textbooks; digital resources. <p>Organization of independent work of undergraduates, individual consultations.</p>
Monitoring and evaluation of the achievability of learning outcomes	<p>Current control on each topic of the discipline, control of knowledge in classroom and extracurricular classes (according to syllabus). Assessment forms:</p> <ul style="list-style-type: none"> • survey in the classroom; • testing on the topics of the discipline; • control works; • protection of independent work; • discussions; • trainings; • colloquiums; • abstract, etc . <p>Boundary control at least twice during one academic period within the framework of one academic discipline. Intermediate certification is carried out in accordance with the working curriculum, academic calendar.</p> <p>Forms of conducting:</p> <ul style="list-style-type: none"> • exam in the form of testing; • oral examination; • written exam; • combined exam; • project protection; • protection of practice reports. <p>Final state certification.</p>

EDUCATIONAL AND RESOURCE SUPPORT OF THE EP

Educational Information Center	<p>The structure of the Educational Information Center includes 6 subscriptions, 16 reading rooms, 2 electronic resource centers (ERC). The basis of the network infrastructure of the Educational and Information Center is 180 computers with Internet access, 110 workstations, 6 interactive whiteboards, 2 video doubles, 1 video conferencing system, 3 A-4 format scanners, JIC software - AIBS "IRBIS-64" under MS Windows (basic set of 6 modules), stand-alone server for uninterrupted operation in the IRBIS system.</p> <p>The library fund is reflected in the electronic catalog available to users on the site http://lib.ukgu.kz on-line 24 hours 7 days a week.</p>
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	<p>Thematic databases of their own generation: "Almamater", "Proceedings of SKSU scientists", "Electronic archive" have been created. Online access from any device 24/7 via the external link http://articles.ukgu.kz/ru/paps.</p> <p>Catalogs are processed electronically. EC consists of 9 databases: "Books", "Articles", "Periodicals", "Proceedings of the teaching staff of SKSU", "Rare Books", "Electronic Fund", "SKGU in Print", "Readers" and "SKU".</p> <p>The EIC provides its users with 3 options for accessing its own electronic information resources: from the "Electronic Catalog" terminals in the catalog hall and in the EIC subdivisions; through the information network of the university for faculties and departments; remotely on the library website http://lib.ukgu.kz/.</p> <p>Open access to international and republican resources: "SpringerLink", "Polpred", "Web of Science", "EBSCO", "Epigraph", to electronic versions of scientific journals in the public domain, "Zan", "RMEB", "Adebiet", Digital library "Aknurpress", "Smart-kitar", "Kitar.kz", etc.</p> <p>For people with special needs and disabilities, the library website has been adapted to the work of visually impaired users</p>
<p>Material and technical base</p>	<p>The department has the following classrooms with a total area of 342 m²: The office of the head of the department, the Office of teachers – Educational and laboratory classrooms botany, plant physiology, teaching methods biology, human anatomy, zoology and the office of undergraduates (building No. 7, Baitursynova str.). Greenhouse with a total area of 3 hundred 60 m² Tauke khan No. 5</p>

APPROVAL SHEET

According to the Educational program 7M05110 - Biology

Director of AID _____ Naukenova A.S.

Director of DCS _____ Nazarbek U.B.

Director of the DEC _____ Bazhirov T.S.