MINISTRY OF SCIENCES AND HIGHER EDUCATION OF THE REPUBLIC OF KAZAKHSTAN
M.O. AUEZOVSOUTH KAZAKHSTAN UNIVERSITY

«APPROVED»
Chairman of the Board-Rector _____ D.Zh.Ahmed- Zaki
«___» _____ 2025 y

EDUCATIONAL PROGRAM
6B01550- Biology

Registration number	6B01500008
Code and classification of the field of education	6B01-Pedagogical science
Code and classification of training areas	6B015-Training of teachers in natural science subjects
Group of educational programs	B013
Type of EP	existing
ISCE level	6
NQF level	6
SQF of education level	6
Language of learning	Kazakh, Russian
Typical duration of study	4years
Form of study	full-time, e distance education
The complexity of the EP, not less	240 credits
Distinctive features of EP	-
University Partner (JEP)	-
University Partner (TDEP)	-
Social Partner (DE)	-

Shymkent, 2025

Developers:

Full Name	Position	Signature
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Absattar G.A.	senior lecturer	
Omar S.	Student of the EP-23-13k1 group	
Myrzayeva A.	Student of the EP-23-13k2 group	
Sikhimbayev A.E.	Director of the NGO "BIOS"	
Bimuratova A.A.	Director of Secondary School No. 62 named after N.Torekulov	
NysanbayevaZh.T.	Director of IT school-lyceum No. 24 named after S. Erubaev	
Zharassova K.S.	Director of secondary school No. 131	
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The OP was considered at a meeting of the Academic Quality Committee of the «Natural Sciences and Pedagogy» Higher School,
Minutes # 6 « 17 » 05 2025 y.

Chairman of the Committee _____ A. Tursinbayev

The EP was considered and recommended for approval at Educational-methodical meeting of M. Auezov SKU

Minutes 4 «18» 03 2025 y.

Chairman of the EMM_____ E.Imangaliyev

The EP was approved by the decision of the Academic Council of the University

Minutes #10 «27» 03 2025y.

CONTENT

1. Concept of the Educational program

University Mission	Generating new competencies, training a leader who translates research thinking and culture.
University Values	• Openness–open to change, innovation and cooperation. • Creativity – generates ideas, develops them and turns them into values. • Academic freedom – free to choose, develop and act. • Partnership – creates trust and support in a relationship where everyone wins. • Social responsibility – ready to fulfill obligations, make decisions and be responsible for their results.
Graduate Model	• Deep subject knowledge, their application and continuous expansion in professional activity. • Information and digital literacy and mobility in rapidly changing conditions. • 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.
The uniqueness of the educational program	• Orientation to the regional labor market and social order through the formation of professional competencies of the graduate, adjusted to the requirements of stakeholders • Practical orientation and emphasis on the development of critical thinking and entrepreneurship, the formation of a wide range of skills that will allow to be functionally literate and competitive in any life situation and be in demand in the labor market
Academic Integrity and Ethics Policy	The university has taken measures to maintain academic integrity and academic freedom, protection from any type of intolerance and discrimination: • Rules of academic integrity (order No. 212 of October 10, 2022); • Anti-corruption standard (order No. 8 n/a dated 08/01/2025). • Code of Ethics (Order No. 212 of October 10, 2022)
Regulatory and legal framework for the development of EP	1.Law of the Republic of Kazakhstan “On Education”; 2. «Model Rules for the Activities of Organisations of Higher and Postgraduate Education», approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 30, 2018 No. 595 as reworded by order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated June 24, 2024. No. 307; 3. Standard rules for admission to training in educational organizations implementing educational programs of higher and postgraduate education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 31, 2018 No. 600 as reworded by order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated July 26, 2024. No. 372; 4. State mandatory standards for higher and postgraduate education, approved by order of the Ministry of Education and Science of July 20, 2022 No. 2 as reworded by order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated March 04, 2025. No. 90; 5. Rules for organizing the educational process in credit technology of education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated April 20, 2011 No. 152 as reworded by order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated April 29, 2024. No. 203;

	6. Qualification reference book for positions of managers, specialists and other employees, approved by order of the Minister of Labor and Social Protection of the Population of the Republic of Kazakhstan dated December 30, 2020 No. 553 as reworded by order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated June 20, 2024. No. 207; 7. Methodological recommendations for introducing ECTS principles into the educational process and expanding academic freedom. Appendix to the order of the Minister of Science and Higher Education. of the Republic of Kazakhstan dated February 12, 2024 No. 57 8. Guidelines for the development of educational programs for higher and postgraduate education, Appendix 1 to the order of the Director of the National Center for the Development of Higher Education of the Ministry of Education and Science of the Republic of Kazakhstan dated May 4, 2023 No. 601 н/қ
Organization of the educational process	• Implementation of the principles of the Bologna Process • Student-centered learning • Availability • Inclusivity
Quality assurance of the Educational program	• Internal quality assurance system • Involvement of stakeholders in the development of the Educational Program and its evaluation • Systematic monitoring • Updating the content (updating)
Requirements for applicants	They are established in accordance with the Standard Rules for admission to training in educational organizations implementing educational programs of higher and postgraduate education by order of the Ministry of Education and Science of the Republic of Kazakhstan No. 600 as reworded by order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated July 26, 2024. No. 372
Conditions for the implementation of educational programs (EP) for persons with disabilities and special educational needs(SSN)	For students with SEN (special educational needs) and persons with disabilities (PSI), tactile PVC tiles, specially equipped toilets, a mnemonic diagram, and shower bars have been installed in educational buildings and student dormitories. Special parking spaces have been created. Crawler lift installed. There are desks for people with limited mobility (PLM), signs indicating the direction of movement, ramps. In the educational buildings (main building, building No. 8) there are 2 rooms with six working places adapted for users with disorders of the musculoskeletal system (DMS).For visually impaired users, the SARA™ CE Machine (2 pcs.) is available for scanning and reading books. The library website is adapted for the visually impaired. There is a special NVDA audio program with a service. The JIC website http://lib.ukgu.kz/ is open 24/7. An individual differentiated approach is provided for all types of classes and in the organization of the educational process.

2. Passport of the Educational program

Purpose of the EP	Training of highly qualified teaching staff in the field of biology, capable of forming knowledge, skills, and intellectual, moral, creative and physical development of the student's personality.
Tasks of the EP	- formation of socially responsible behavior in society, understanding the importance of professional ethical standards and following these standards; - providing basic undergraduate training to enable them to continue their studies throughout their lives, to adapt successfully to changing conditions throughout their professional careers; - providing conditions for the acquisition of a high general intellectual level of development, mastering competent and developed speech, culture of thinking and skills of scientific organization of work in the field of training future teachers of biology in accordance with the updated content of secondary education; - training of a multilingual biology teacher with knowledge of Kazakh, English and Russian languages and methods of teaching biology in three languages in secondary schools; - 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. - Creating conditions for the formation of in-demand knowledge and skills, a conscious attitude towards improving the well-being of the population and protecting the planet in the context of the SDGs
Harmonization of EP	• 6 level of the National Qualifications Framework of the Republic of Kazakhstan; • Dublin descriptors of the 6th level of qualification; • 1 cycle of a Framework for Qualification of the European Higher Education Area); • 6^{th} Level of European Qualification Framework for Life long Learning).
Connection of the EP with the professional sphere	1.Professional standard "Teacher" (order of the actingMinister of Education of the Republic of Kazakhstan No. 500 dated 15.12.2022) 2.Professional standard "Forensic molecular genetic examination/ research" according to Appendix 6 to this (Order No. 60 dated January 23, 2024)
Name of the degree to be awarded	After successful completion of this OP, the graduate is awarded a Bachelor of Education degree in the educational program 6B01505 – Biology (IP)
List of qualifications and positions	The trainee teacher. Qualification directory of managers, specialists and other employees, approved by the Order of the Minister of Labor and Social Protection of the Republic of Kazakhstan No. 553 dated 30.12.2020.
Field of professional activity	Educational activities
Objects of professional activity	- educational organizations (secondary and specialized schools, colleges and lyceums):
Subjects of professional activity	The subjects of professional activity of the Bachelor of Education in Biology are the planning and organization of educational activities of students using innovative psychological and pedagogical methods and tools
Types of professional activity	- educational (pedagogical); - educational and educational; - social and pedagogical; - scientific research; - organizational and managerial;

	- information and communication.
Learning outcomes	LO1 Communicate freely in the professional environment and society in Kazakh, Russian and English, using the methods of scientific research, academic writing, taking into account the principles and culture of academic honesty. LO2 Demonstrate natural-scientific, social, socio-economic knowledge in professional activities. LO3 Have the ability to analyze and perceive theoretical information on the structure, morphology and functions of living organisms. LO4 To use various information resources, ready-made software and methodological complexes, computer and multimedia technologies, digital educational resources in professional activities. LO5 Demonstrate cultural and professional development based on the formation of ideological, civic, spiritual and social responsibility, methods of scientific and experimental research. LO6 Analyze modern scientific and practical problems, apply modern achievements of promising areas of biological industries. LO7 Possess the skills of organizing the pedagogical process according to the updated content of education. LO8 - Apply methods of studying biological and geographical objects using artificial intelligence: observation, description, identification and classification. LO9 - Carry out the educational process using modern technologies, artificial intelligence and interactive teaching methods, taking into account the specifics of teaching biology. LO10 Use biological methods to conduct research in the educational process and apply field, statistical methods to solve practical problems LO11 To use research, entrepreneurial skills and skills of working in conditions of uncertainty. LO12 Work effectively both individually and as a team member, demonstrate the ability to create an individual educational trajectory throughout life for self-development, career growth and professional success.

3. Competencies of a graduate of the EP

GENERAL COMPETENCIES (SOFTSKILLS). Behavioral skills and personal qualities	
GC 1. Competence in managing one's literacy	SS1.1.The ability of self-learn, self-develop and constantly update their know ledge with in the chosen trajectory and in an inter disciplinary 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.
GC 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.
GC 3. Mathematical competence and competence in the field of science	SS3.1.The ability and willing nessto 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.
GC 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.
GC 5. Personal, social and educational 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 aility 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.
GC 6. Entrepreneurialcom petence	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, all ocateresources and manage your time. SS6.3. The ability to work with consumerrequests.
GC 7. Cultural awareness and self-expression	SS7. 7.1. The ability to show ideological, civic and moral positions. SS7.2. The ability to be tolerant of the traditions and culture of other peoples of the world, to possess high spiritual qualities.
PROFESSIONAL COMPETENCIES (HARDSKILLS).	
Theoretical knowledge and practical skills specific to this field	PC1 - Be able to possess knowledge in the field of pedagogical goal-setting, the skills and abilities of designing and implementing a holistic pedagogical process, be capable of positive thinking, attached to the system of national values, committed to ethical values, inclined to humanism and optimism;
	PC2 - Demonstrate fundamental biological knowledge in botany, zoology, human anatomy, cytology, histology, human and animal physiology, genetics, molecular biology, microbiology and virology, ecology; know the manifestations of the fundamental properties of the organism - heredity and variability at all levels of the organization of the living (molecular, cellular,

	organismal and population);
	PC3 - Demonstrate knowledge of the functioning of living systems, levels of their organization, basic concepts, methods and prospects for the development of biology, use methods of observation, description, identification and classification of biological objects;
	PK4 - To know the features of morphology, physiology, reproduction, geographical distribution and ecology of representatives of the main taxa, the principles of system organization, differentiation and integration of body functions;
	PC5 - Use biological and pedagogical methods in professional activities, master the methodology of teaching biology, engage in educational activities among the population in order to increase the level of biological, ecological and artificial intelligence literacy of society;
	PC6- Apply modern experimental methods of work in the research work of students in the field and laboratory conditions; have skills in processing the results of field and experimental research; be able to organize and conduct extracurricular forms of work with schoolchildren; systematize and apply modern technologies and interactive teaching methods;
	PC7 - Be able to work with artificial intelligence and modern equipment and facilities to carry out research, field and laboratory work; develop and organize research projects with students;

3.1 Matrix of correlation of the learning outcomes of the educational program as a whole with the competences formed

	LO1	**LO2**	**LO3**	**LO4**	**LO5**	**LO6**	**LO7**	**LO8**	**LO9**	**LO10**	**LO11**	**LO12**
GC 1	✓	✓	✓									
GC 2	✓			✓	✓							
GC 3		✓				✓					✓	
GC 4	✓			✓					✓			
GC 5		✓	✓									✓
GC 6		✓									✓	✓
GC 7					✓						✓	✓
PC1				✓	✓		✓					
PC2		✓				✓		✓				
PC3		✓				✓		✓				
PC4			✓							✓	✓	
PC5							✓		✓	✓		
PC6								✓	✓	✓	✓	
PC7		✓	✓	✓				✓			✓	✓

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

№	The name of the module	CYCLE	UC/CC	Component name	Short description of the discipline	Number of credits	The generated RO (codes)											
							LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12
	Fundumentals of Public Science	GED	CC	History of Kazakhstan	Purpose of the discipline**:** The formation of an objective idea of the history of Kazakhstan based on a deep understanding and scientific analysis of the main stages, patterns and originality of the historical development of Kazakhstan. Content: Ancient people and the formation of nomadic civilization. Turkic civilization and the great steppe. Kazakh Khanate. Kazakhstan in the era of modern times. Kazakhstan as part of the Soviet administrative-command system. Declaration of Independence of Kazakhstan. State system, socio-political development, foreign policy and international relations of the Republic of Kazakhstan. Methods and techniques of historical description for the analysis of the causes and consequences of events in the history of Kazakhstan.	5		✓			✓								
		GED	CC	Philosophy	Purpose of the discipline**:** The formation of a holistic idea among students about philosophy as a special form of knowledge of the world, about its main sections, problems and methods of studying them in the context of future professional activity. And also the formation of philosophical reflection, introspection and moral self-regulation among students. Content: Emergence of a culture of thinking. Subject and method of philosophy. Fundamentals of philosophical understanding of the world: questions of consciousness, spirit and language.	5		✓			✓								✓

					Being. Ontology and metaphysics. Cognition and creativity. Education, science, technology and technology. Human philosophy and the world of values. Ethics. Philosophy of values. The subject of aesthetics as a field of philosophical knowledge. Philosophy of freedom. Philosophy of art. Society and culture. Philosophy of history. Philosophy of religion. "Mangilik El" and "Modernization of Public Consciousness" are a new Kazakhstan philosophy.													
	Socio-Political Knowledges	GED	CC	Sociology and Politology	Purpose of the discipline**:** The goal of forming knowledge about social and political activities, explaining social and political processes and phenomena. Content:Consideration of the system of socio-ethical values of the society. Ways to use social, political, cultural, psychological institutions, features of youth policy in the modernization of Kazakhstani society and solve conflict situations in society and professional environment based on them. To study the methods of analysis and interpretation of political institutions and processes, ideas about politics, power, state and civil society, to understand and use the methods and methods of sociological, comparative analysis, to understand the meaning and content of the political situation in the modern world. Analysis and classification of the main political institutions.	4		✓			✓							✓
		GED	CC	Cultural Studies and Psychology	Purpose of the discipline**:** The formation of scientific knowledge of history, modern trends, current problems and methods for the development of culture and psychology, the skills of a systematic analysis of psychological phenomena. Contents: Morphology, language, semiotics, anatomy of culture. Culture of nomads, proto-Turks, Turks. Medieval culture of Central Asia. Kazakh culture at the turn of the XVIII - XIX centuries, XX century. Cultural policy of Kazakhstan. State Program "Cultural Heritage". National consciousness, motivation. Emotions, intellect. The will	4					✓					✓			

					of man, the psychology of self-regulation. Individual typological features. Values, interests, norms are the spiritual basis. The meaning of life, professional self-determination, health. Communication of the individual and groups. Socio-psychological conflict. Models of behavior in conflict.													
	Socio-ethnic Development	GED	HsC	Ecosistem and Law	Purpose of the discipline**:** Formation of integrated knowledge in the field of economics, law, anti-corruption culture, ecology and life safety, entrepreneurship, scientific research methods. Content: Fundamentals of safe human-nature interaction, ecosystem and biosphere productivity. The entrepreneurial activity of society in conditions of limited resources, increasing the competitiveness of business and the national economy. Regulation of relations in the field of ecology and human life safety. Knowledge and compliance of Kazakhstan's law, obligations and guarantees of subjects, state regulation of public relations to ensure social progress. Application of scientific research methods.	5		✓									✓	✓
		BD	EC	Abai Studies	Purpose of the discipline**:** based on the creativity of A.Kunanbayev, the preservation of the «national code» and in the project «Kazakhtanu» Content: Historical overview of the history of Kazakhstan and Kazakh literature of the XIX-XX centuries. Studies of Abai's legacy of the XX-XXI century. Chronology of Abai's creativity. Abai is a great poet, ethnographer, founder of Kazakh written literature. Abai is the compiler of the code of laws «The Position of Karamola», social significance. Abai is a thinker, religious scholar, philosopher. The role of Abai in education and science, the concept of a «Holistic person». «Words of Edification»by Abai, an epic novel by M.Auyezova «The Way of Abai» . K. Tokayev «Abai and Kazakhstan in the XXI century», role, significance.	3					✓							✓
		BD	EC	Muhtar Studies	Purpose of the discipline**:** Formation of a historical, literary idea of M. Auezov's work in the context of literary history, patriotism and cultural and spiritual position. Development of artistic thinking, skills of independent research activity.						✓							✓

					Content: The life and creative path of M. Auezov Semipalatinsk, Tashkent, St. Petersburg periods. M. Auezov's activity in the magazines «Sholpan», «Abai». M. Auezov's journalism. An artistic review of the short stories "Korgansyzdyn kuni", "Kyr suretteri", "Okagan azamat", "Kokserek", the play Enlik-Kebek and the stories "Kili Zaman", "Karash-Karash" okigasy", the monograph "Abai Kunanbayev", the epic novel "Abai Zholy".												
		BD	EC	Basicso ffinancia lliteracy	The purpose of the discipline is to study personal and family financial resources, which are critical to achieving financial well-being. Contents of the discipline.Financial planning and consumer safety.Basic methods and techniques for effective spending and saving money. Protecting and investing your own financial resources. The role and significance of personal finance, its capabilities for achieving financial stability.Filtering out a lot of dubious financial information.Incentives for independent management of responsibilities and optimal financial capabilities of the consumer.Makingsmartfinancialdecisionswhenbuil ding a professionalcareer.			✓			✓							
		BD	EC	Fundations of of Anticorruption Culture	Purpose of the discipline**:** formation of an anti-corruption worldview, strong moral foundations of a personality, civic position, stable skills of anti-corruption behavior. Content: Overcoming legal nihilism, formation of the basics of students' legal culture in the field of anti-corruption legislation. Formation of a conscious perception/attitude towards corruption. Moral rejection of corrupt be haviour, corrupt morality and ethics. Development of skills necessary to fight corruption. Development of anti-corruption standards of conduct. Anticorruption propaganda, dissemination of lawfulness and respect for the law. Activities aimed at understanding the nature of corruption, awareness of social damage caused by its manifestation, ability to defend one's						✓							✓

					position with arguments, seeking ways to overcome manifestation of corruption.												
		BD	EC	Fundamentals of artificial intelligence	Objective: To develop competencies in the use of knowledge and practical application of artificial intelligence tools and methods, in alignment with the priorities of the AI-Sana program. Contents: Introduction to Artificial Intelligence (AI). Development of practical skills and abilities, including: using AI tools; working with large language models (LLMs); utilizing no-code AI platforms; employing generative AI tools; image recognition; natural language processing (NLP); and data visualization through AI. Understanding the application of AI in various fields and exploring its potential through the integration of AI-Sana program approaches.		✓			✓						✓		
Additional modules beyond the qualification framework																	
	Communication and Physical Training	GED	CC	Kazakh (Russian) language	Purpose of the discipline**:** formation of students' intercultural and communicative competence in the process of foreign language education at a sufficient level A2 and a level of basic sufficiency B1. Student reaches B2level of common European competence if the language level at the start is higher than B1level of common European competence. Content: Levels A1, A2, B1, B2 are presented in the form of cognitive-linguocultural complexes, consisting of spheres, themes, sub-themes and typical situations of international standard's communication: social, social - cultural, educational and professional, modeled by forms: oral and written communication, written speech works, listening. Demonstration of language material's understanding in texts on educational program, knowledge of terminology and critical thinking development.Purpose of the discipline**:** formation of communicative competence using the Kazakh (Russian) language in the socio-cultural, professional and public life, improvement of the ability to write academic texts. Content: Levels A1, A2, B1, B2-1, B2-2 (B2, C1 Russian language) are presented in the form of cognitive-linguocultural complexes, consisting of spheres, themes,	10	✓									✓		

					sub-themes and typical situations of communication of the international standard: social, social - cultural, educational and professional, modeled by forms: oral and written communication, written speech works, listening. Demonstration of understanding of the language material in the texts on the educational program, knowledge of terminology and development of critical thinking.													
		GED	CC	Foreign language	Purpose of the discipline**:** formation of students' intercultural and communicative competence in the process of foreign language education at a sufficient level A2 and a level of basic sufficiency B1. Student reaches B2level of common European competence if the language level at the start is higher than B1level of common European competence. Content: Levels A1, A2, B1, B2 are presented in the form of cognitive-linguocultural complexes, consisting of spheres, themes, sub-themes and typical situations of international standard's communication: social, social - cultural, educational and professional, modeled by forms: oral and written communication, written speech works, listening. Demonstration of language material's understanding in texts on educational program, knowledge of terminology and critical thinking development.	10	✓										✓	
		GED	CC	Physical Training	Purpose of the discipline**:** the formation of social and personal competencies and the ability to purposefully use the means and methods of physical culture that ensure the preservation and strengthening of health in preparation for professional activity; to the persistent transfer of physical exertion, neuropsychic stresses and adverse factors in future work. Content: Implementation of physical culture and health and training programs. A complex of general development and special exercises. Sports (gymnastics, sports and outdoor games, athletics, etc.). Control and self-control during classes, insurance and self-insurance. Refereeing competitions, Means of professionally applied physical training. Modern health-improving systems: the breathing system according to A. Strelnikova, K. Buteyko, K. Dinaiki, joint gymnastics according to Bubnovsky.	8					✓					✓		✓

		BD	Hs C	Professionally oriented foreign language	Purpose of the discipline**:** to read and translate texts related to the profession in English, establish communication on professional topics, understand and use language material in oral and written speech. Content: The place of the English language in the study of biology. Characteristics and levels of living organisms. The structure of the bacterium. Features of the simplest.Structure and diversity of animals. The plant world. The relationship between the environment and living organisms. The evolutionary development of life.	3	✓										✓	
		GED	CC	Information and Communication Technologies	Purpose of the discipline**:** formation of the ability to critically evaluate and analyze processes, methods of searching, storing and processing information, methods of collecting and transmitting information through digital technologies. Development of new "digital" thinking, acquisition of knowledge and skills in the use of modern information and communication technologies in various activities **Contents:** Introduction and architecture of computer systems. Software. Operating systems. Human-computer interaction. Database systems. Data analysis. Data management. Networks and Telecommunications.Cybersecurity. Internet technologies. Cloud and Mobile technologies. Multimedia technologies. Smart technology. E-technologies. Electronic business. Electronic government.	5	✓			✓							✓	
Total on AMBQF:																	
INTERDISCIPLINE MODULES																	

	Fundamentals of Pedagogical Skills	BD	HsC	Pedagogy and Cyberpedagogy	Purpose of the discipline: The aim is to equip future teachers with professional competencies on the theoretical and methodological foundations of modern pedagogical science, the technology of organizing the pedagogical process, the formation of students' readiness to design and construct the educational process based on information and communication technologies based on the laws and scientific principles of cyberpedagogy. Content: The genesis of pedagogical science, regularities and principles of a holistic pedagogical process. Fundamentals of the theory of education and didactics. Problems of modern school management. Scientific principles and regularities of cyberpedagogy, methodology and technology for managing the educational process based on information and communication technologies, methods of distance learning and blended learning.	5					✓		✓		✓			
		BD	HsC	Inclusive education	Purpose of the discipline: The aim is familiarization with modern world and domestic theories of inclusive education, the formation of future teachers' professional competencies in the design and organization of inclusive education. Content. Social significance and features of inclusive education. Patterns, principles and models of inclusive education, legal documents regulating the activities of inclusive education in a mass school. Approaches and technologies for organizing inclusive education in educational institutions. Methods of psychological and pedagogical support and creating a comfortable environment for inclusive education of children with special educational needs. Problems of creating an inclusive educational environment.	4									✓	✓		✓
		PD	HsC	Practicum of Special Subjects	Purpose of the discipline: to form students ' scientific and theoretical knowledge and master the methods of teaching disciplines for the specialty “Biology” at the University. Content.The purpose, objectives of the course" methods of teaching special disciplines in a higher educational institution". The development of special pedagogy on the basis of technological and information achievements of the XX century. The current state of the practice and	4		✓				✓			✓			

					theory of special pedagogy. Training of professionals in the system of special and inclusive education. Professional and personal qualities of a teacher in the system of special education. The philosophical justification of special pedagogy and special psychology. Methodological support of special disciplines. The structure of training sessions in a special discipline.													
		BD		Introduction to the teaching profession (pedagogical practice, 1st year)	This course is aimed at developing the following areas of pedagogical competencies: - Competencies in the field of pedagogy and didactics - Competencies for interaction - Competencies for the working environment of teachers - Competencies for professional development The purpose of this course is to familiarize future teachers with the educational process and the situation in the organization of education and their adaptation to the conditions of future professional activity.	1							✓		✓	✓		
	Fundamentals of Psychopedagoical Sciences	BD	HsC	Physiology development of schoolchildren	The purpose of the discipline: to provide future teachers with modern data on the anatomical and physiological features of the body of children and adolescents, its relationship with the environment, to equip them with knowledge about the laws underlying the preservation and strengthening of students ' health, maintaining their high working capacity in various educational activities. Content: growth and development of the body; development of the nervous system;formation of higher nervous activity and its formation in the process of Child Development; sensory ; endocrine; musculoskeletal; respiratory; digestive; blood and cardiovascular system. Protection of the health of schoolchildren, formation of rules for a healthy lifestyle.	4		✓	✓							✓		

		BD	HsC	Fundamentals of General and age Psychology	The purpose of the discipline: the development of students ' psychological thinking on the basis of studying and mastering knowledge about various mental phenomena, taking into account the age characteristics of the development of the human psyche. Content: introduction to Psychology. Consciousness. Personality. Activity. cognitive processes. Psychology of will, emotion, feelings. Temperament. Character. Features. The structure, functions, patterns of the psyche in ontogenesis, cognitive processes, conditions, factors, mechanisms of development of the psyche. Methodological foundations, concepts, categories, mechanisms of Developmental Psychology, the nature of age-related changes. Features, causes and factors, conditions and prospects for the positive development of the personality at different age stages of the development of the human psyche.	4		✓	✓							✓		
		BD	HsC	Theory and Methodology of Educational Work	The purpose of the discipline: the formation of professional competencies of future teachers in the design, compilation and organization of educational work at school. Content: the essence and features of the educational process of the school and class, educational work, educational systems, the content, activities of the class teacher, planning educational work at school and in the classroom, organizing the class team and individual educational work with students, skills in providing pedagogical assistance, skills in working with difficult and gifted children, methods of working in cooperation with parents of students, problems of Career Guidance work with students. Methods for diagnosing the effectiveness of educational work.	4		✓					✓		✓			
		BD		Psychological-pedagogical assessment (pedagogical practice, 2nd year)	This course is aimed at developing the following areas of pedagogical competence: -Competence in the field of pedagogy and didactics -Area of competence for interaction -Area of competence for the working environment of teachers - Area of competence for professional development The purpose of this course is to familiarize future	2					✓		✓			✓		

					teachers with the features of the integrated pedagogical process of an educational institution and to develop analytical-reflexive, research, project and other skills in the field of psychological and pedagogical support of the educational process.													
Total on IM																		
SPECIALITY MODULES																		
	Innovative Methods and Basics of Methodical Approaches in Teaching and Learning	PD	HsC	Methods of Teaching and Assessment in Biology	The purpose of the discipline: to prepare future teachers who have mastered the content of biological disciplines, methodological knowledge, a qualification system and a system for assessing students ' academic achievements in general secondary schools. Content: history of the development of biology teaching methodology. Material base for teaching biology. Basic didactic principles in the methodology of biology. The formation and development of biological concepts in a school subject. Methods of teaching biology. Organization of educational work in biology. Testing and evaluation of knowledge in biology lessons.	6		✓					✓		✓			
	Innovative Methods and Basics of Methodical Approaches in Teaching and Learning	PD	HsC	Pedagogical Studies	The purpose of this course is to improve the following areas of pedagogical competence: -Area of competence for professional development Prospective teachers have the skills to search for and critically select theoretical knowledge from a variety of reliable sources, to use research findings in developing their pedagogical thinking and practice, and to demonstrate a commitment to promoting research-based teaching and learning as well as their own continuous development and professional growth. .	5		✓					✓		✓			
	Innovative Methods and Basics of Methodical Approaches in Teaching and Learning	PD	HsC	Action Research	The purpose of the course: to develop in students the skills of planning, implementation and analysis of the effectiveness of using Action Research approaches in teaching physics. Content: stages of this approach: planning, conducting a research lesson, analyzing it, re-planning taking into account the results obtained in the learning process. The characteristics of the stages are discussed in order to analyze the reaction of the "studied" students to the			✓					✓		✓			

					method used, as well as the experience gained for further improvement of the teaching methodology. The stages of implementing the Action Research approach are outlined, and examples of implementing the Action Research approach in a real classroom are given.													
	Innovative Methods and Basics of Methodical Approaches in Teaching and Learning	PD	HsC	Research, Development and Innovation of biology	The aim of the course: To provide students with a comprehensive education on modern research methods and innovative achievements in biology. In addition, to instill in them scientific thinking and practical research skills. Contents: The course "Research, Development and Innovation in Biology" studies modern research methods and innovations in the field of biological sciences. The course examines issues of biotechnology, ecology, genetics, digital technologies and bioethics.	4		✓					✓		✓			
	Innovative Methods and Basics of Methodical Approaches in Teaching and Learning	PD	HsC	Lesson Study	Objective: to develop students' skills in planning, implementation and analysis of the effectiveness of using Lesson Study approaches in teaching physics. The characteristics of the stages are discussed in order to analyze the reaction of the "studied" students to the method used, as well as the experience gained for further improvement of the teaching methodology. The characteristics of the stages are discussed in order to analyze the reaction of the "studied" students to the method used, as well as the experience gained for further improvement of the teaching methodology.			✓					✓		✓			
		PD	EC	Innovative Methods of Teaching in Biology Course	Purpose of the discipline: the purpose of the discipline is to prepare future teachers who have mastered the system of applying new teaching methods and techniques to improve the quality of students ' knowledge in school biology. Content: the concept of innovation. Classification of innovative methods. Basic principles and goals of interactive learning, classification. The use of interactive methods in biology lessons. Advanced learning technologies; level - based learning, modular learning, information learning, reference signal learning, problem-based learning. The importance of using developmental	4		✓					✓		✓			

					learning technologies in biology.													
		PD	EC	Methods of Application of Information Technologies in Biology Course	The purpose of the discipline: the development of creative thinking, independent research skills with teaching methods of using modern information technologies in the course of Biology. Content: software and technical means of teaching biology, educational information-the basis of teaching biology, the principles of using information technologies in teaching biology, didactic functions of teaching tools, informatization of general biological knowledge, information resources for teaching biology, the use of Information Technologies in the system in teaching biology. Improving teaching activities with information technology tools, mobile training class, digital microscope, telecommunications networks and servers, digital photo and video equipment, features of the use of information technology tools in teaching biology.					✓		✓			✓			
		BD	EC	Cytology and Histology	The purpose of the discipline: is to form ideas about the structure and structures, types, functions of cells and tissues. Content: current cell research methods consider electron microscopes. Structure and function of cell organelles to know cell division. Skin epithelium to make a description of exocrine glands. Blood tissues. Erythropoiesis, granulopoiesis, loose connective tissue. Dense connective tissue. Cartilage tissue muscle structure, histogenesis explanation of skeletal tissues. Tissues of the nervous system. General information about the structure, location, function, types of synapses.	5		✓	✓			✓						
		BD	EC	Biology of Individual Development	The purpose of the discipline: the course is devoted to the modernization of organisms, ontogenesis and acquisition of knowledge about Phylogenesis, life cycles, stages and processes of individual development, biological age. Content: pre-germ development gametogenesis. General description of spermatogenesis, oogenesis. Primary embryonic regulation. Neurulation. Differentiation of the biological meaning of gastrulation and neurulation in the early embryogenesis of the lancetnik, amphibians, bone fish, birds, mammals, humans. Blastula type, gastrulation			✓	✓			✓						

					stage, gastrula type. Neurulation type of egg cell in amphibians, fertilization, crushing analysis.													
		PD		Biomedicine and bioinformatics	The purpose of this course is to improve the following areas of subject competence: -Conceptual and theoretical knowledge competence -Research competence -Application competence in science The course focuses on the use of theoretical knowledge and practical skills in biology in integration with physics and computer science, applying basic knowledge in the field of molecular biology and genomics, as well as the basics of statistics and mathematics. During lectures, practical and laboratory classes, future teachers analyze the impact of natural phenomena (photobiological, electrical, sound, etc.) on living organisms, the principles of structured bioinformatics for revealing the essence of biological phenomena, the database search algorithm (BLAST), and the basics of gene mapping. When studying this course, interdisciplinary competencies (BTEAM) are formed to solve creative problems, practical skills in biological physics are developed in solving problems of biomedicine, biomechanics, etc. The course contributes to the development of practical skills in working with biological databases (DNA, RNA, proteins), modeling biological processes The student can write a good scientific report and use biophysical and bioinformatics methods to solve research questions, working independently and in groups. At the end of the course, future teachers defend a project and a scientific report, passing an exam.	4							✓		✓	✓		
	Fundamentals of Natural Sciences	PD	EC	Biophysics	The purpose of the discipline: objects and features of biophysical processes in living organisms,basic laws and principles, familiarization with biophysical approaches to biological phenomena. Contents: kinematic characteristics of the mechanical movement of Biosystems. Laws of energy storage and transformation in living organisms. Oscillatory processes. Physical foundations of acoustics. Hemodynamics.	4		✓	✓			✓						

					Theory of muscle contraction. Characteristics of contractile proteins. Transport of matter across the membrane. Bioelectric processes. Laws of electrolysis. Biological effects of optical Rays. Photoreception. Radiation Biophysics. Environmental biophysics.													
		BD	EC	General Chemistry	Purpose of the discipline: this discipline forms in students the foundations of modern achievements of Chemical Science about the structure of matter, the laws and laws of chemical processes, the basics of chemical thermodynamics, the order and properties of substances in various states of aggregation. Contents: theoretical foundations of general chemistry, the arrangement of elements that make up the chemical properties of substances in the periodic system of D. I. Mendeleev, the main theories of solutions, the law of masses and the law of equivalence, the laws of biological and chemical processes, chemical equilibrium, thermodynamics of surface phenomena, properties of dispersed systems, the main sections and types of chemical analysis are considered.	4		✓				✓					✓	
		BD	EC	Biochemistry	The purpose of the discipline: to form the basis of students ' knowledge about the composition and properties of chemical compounds that are part of living organisms, the mechanisms of regulation of metabolism and the Basic Laws of chemical and biological processes. Content: the discipline covers the chemical composition and biochemical processes occurring in living organisms, the study of the products of its exchange of the composition of the body, the definition of the function of various organs and tissues, the importance of chemical processes underlying the life of organisms, the release, accumulation and use of energy in the body, the formation and release of final decay products, the study of the mechanisms of			✓				✓					✓	
	Biological Sciences on Objects of Research	BD	EC	Anatomy and Morphology of Plants	The purpose of the discipline: to form an idea of the morphology and anatomical structure,features of vegetative and generative organs of plants. Content: structure, classification of plant cells and tissues;morphological features and features in the anatomical structure of plant organs. Seasonal and age	5			✓					✓			✓	

					changes of plants, reproduction and development , ontogenesis and evolutionary directions of germ, sprout, flowering plants.													
		BD	EC	Structural Botanics	The purpose of the discipline: the formation of ideas about the diversity of plants of the lower and upper stages, the formation and features of the morphological and anatomical structure, evolution. Content: history of the development of the discipline, research methods, sections. Structural features of vegetation and tissues. Tuber and shoot; Root and root systems; Leaf and stem; metamorphosis of plant organs; morphological foundations of plant reproductive biology. Morphological diversity of the flower. Description of the fruit, principles of classification.				✓					✓			✓	
		BD	EC	Systematics of Plants	The purpose of the discipline: the formation of knowledge about the laws of plant distribution,area, community structure, diversity, classification. Content: formation of the science of plant geography, research methods. Flora. Boundaries of the territory of flora, geomorphological structure. Phytocenoses, the location of phytocenoses on Earth. Intraregional plants.Areal. Whole areal and disjunctive (fragmented) areal. Relict and endemics. Floristic zones: Holarctic, paleoarctic, Arctic, tropical, subtropical, savannas, Australian, Captic . Ecological environment and life forms of plants.	6			✓					✓			✓	
		BD	EC	Geography of Plants	The purpose of the discipline: the formation of knowledge about the laws of plant distribution,area, community structure, diversity, classification. Content: formation of the science of plant geography, research methods. Flora. Boundaries of the territory of flora, geomorphological structure. Phytocenoses, the location of phytocenoses on Earth. Intraregional plants.Areal. Whole areal and disjunctive (fragmented) areal. Relict and endemics. Floristic zones: Holarctic, paleoarctic, Arctic, tropical, subtropical, savannas, Australian, Captic . Ecological environment and life forms of plants.				✓					✓			✓	
		BD	EC	Invertebrate Zoology	The purpose of the discipline: to familiarize with representatives of the main types and classes of animals, to study their morphology, physiology, ecology,	6			✓					✓			✓	

					Reproduction, Development, significance, phylogeny. Content: History of the development of the animal world. General characteristics of multicellular organisms. Morphology and physiology of the type ciliates or infusoria. Morphology and physiology of the type of flatworms. The type of roundworms or primary cavity worms is a general characteristic. Morphology and physiology of the type of Bumblebee worms. Class of leeches. Mollusk type. Arthropod type. Cheliceralsartype branch. Class of nasecoms. The type of Thorns is a general characteristic.													
		BD	EC	Zoogeography	The purpose of the discipline: to familiarize with representatives of the main types and classes of animals, to study their morphology, physiology, ecology, Reproduction, Development, significance, phylogeny. Content: History of the development of the animal world. General characteristics of multicellular organisms. Morphology and physiology of the type ciliates or infusoria. Morphology and physiology of the type of flatworms. The type of roundworms or primary cavity worms is a general characteristic. Morphology and physiology of the type of Bumblebee worms. Class of leeches. Mollusk type. Arthropod type. Cheliceralsartype branch. Class of nasecoms. The type of Thorns is a general characteristic.				✓					✓			✓	
		BD	EC	Vertebrate Zoology	The purpose of the discipline: to study the diversity of animals, features of construction, vital activity, adaptability to the environment, distribution patterns, increase their productivity, effective use and the formation of its reserves in nature. Content: type of chordates. General characteristics of the type. The larva is chordalar or crustacean type branch. Vertebrates or other vertebrates are a Class of Round-mouthed animals, a general characteristic. "I'm sorry," she said. Fish. Class of cartilaginous fish, general characteristics . Class of bony fish, general characteristics. Systematics. Class of amphibians, general characteristics. Systematics. Class of reptiles, general characteristics. Systematics. Class of birds. General characteristics of birds. Systematics. Class of mammals or beasts, general description.	4			✓					✓			✓	

		BD	EC	Zoosystematics	The purpose of the discipline: to form problems of studying, analyzing and presenting the taxonomic series of the animal world. Mastering the systematization of the animal world (species, genus, genus, type, world), teaching modern systematics of fauna. Content: analysis of the systematics of the animal world. Multicellular (Metazoa). The ciliophora or infusoria type is Ciliophora. The type of flatworms is Plathelminthes. Roundworms or the type of primary cavity worms are Nemathelminthes or ashelminthes. The type of Bumblebee worms is Annelida. The class of leeches is Hirudinea. Mollusca type-Mollusca. The arthropod type is Arthropoda. Chelicerates Are Chelicerata. Class of nasecoms-Insesta. The type of Thorns is Echinodermata.				✓					✓			✓	
		BD	EC	Introduction to specialty	The purpose of the discipline: to form students a holistic understanding of the main stages of the development of biology as a science, branches and structures, research methods and professional image of future biology teachers. Content: the need, orientation as a specialist, the main stages, branches and structures of the development of biology as a science. Methods of studying the model of a biologist-specialist, professionogram, psychogram, properties that ensure the implementation of the professional activity of a biologist. Stages of professional formation of personality.	4						✓	✓		✓			
		BD	EC	Fundamentals of Academic Writing	The purpose of the discipline: to master general rules and methods based on the technique of cognition and its individual approaches, professional reading, academic writing and oral presentation skills. Content: academic reading and writing skills, language and structure of scientific and professional texts. Synopsis, abstracts reviews, writing theses, familiarizing yourself with the results of scientific analysis, reading scientific and professional texts. Increasing the vocabulary of students with language turns characteristic of the scientific and professional environment used in academic vocabulary. Development of skills for entering scientific and professional discussions and presentation of professionally oriented projects. Skills of independent work.		✓	✓									✓

		BD	EC	Human Anatomy	The purpose of the discipline: the formation of knowledge about the structure of a person and his systems based on modern modern achievements of macro - Microscopic Anatomy, anatomical and topographic relationships of organs. Content: anatomical research methods. Osteology and the doctrine of muscles, as well as internal organs-Splanchnology. Anatomy and topography of the respiratory system. The doctrine of the blood and vascular system. Structure and topography of the heart. Structure, topography of the central nervous system, brain and its departments. The doctrine of the endocrine glands. Structure and topography of the urinary and sensory system.	5			✓			✓					✓	
		BD	EC	Human Biology	The purpose of the discipline: knowledge of the Basic Laws of morphological and structural features of the human body and the formation of knowledge about its ontogenesis and phylogenetic variability. Content: basic methods of studying human biology. The passive part of the motor apparatus is the skeleton. The active motor apparatus of the body is Myology. General structure of the digestive system. General characteristics of the structure of respiratory organs. Circulatory system. Structure and topography of the heart. The structure of the nerve, its significance. Central nervous system. Large hemispheres, their structure. The system of endocrine glands. The urinary system. Senses-esthesiology.				✓			✓					✓	
	Biological Sciences by Levels of Organization and Properties of Living Matter	BD	EC	Human and Animal Physiology	The purpose of the discipline: to form an idea of the General Laws of interaction of the human and animal body with the environment, the physiological characteristics of organs. Content: the subject of Physiology in the system of biological disciplines. Object and methods of research of Physiology. Types of excitable cells, main function. Striated muscle, muscle structure. Physiology of the nervous system. Physiology of the circulatory and respiratory excretory systems, digestive systems. Endocrine system. The main properties of the hormone. Physiology of sensory systems. Physiology of higher nervous activity.	4			✓			✓		✓				

		BD	EC	Age Physiology and School Hygiene	The purpose of the discipline: to equip future teachers with up-to-date information about the young characteristics of a growing and developing body, knowledge in order to preserve and strengthen the health of schoolchildren. Contents: history of the subject of age physiology and school hygiene. Ontogenic development. Description for each age period. Periodization of age. The time of change,its features. General structure, significance, development of the nervous system. The reflex is the basis of nerve action. Conditioned and unconditioned reflex. The importance, general construction of analyzers (analyzers). Common properties of analyzers.				✓			✓				✓		
		BD	EC	Microbiology with the basics of biotechnology	The purpose of this course is to improve the following areas of professional competence: -Conceptual and theoretical knowledge competence -Research competence -Application competence in science The course covers the study of morphology, physiology, biochemistry, genetics and taxonomy of microorganisms. In addition, the principles of using bacterial, yeast, animal and plant cell cultures, metabolism and biosynthetic capabilities in genetic engineering and biotechnological production are discussed, using knowledge of chemistry and physics. After completing the lecture course, future teachers have good basic knowledge of the prospects for the development of biotechnology: methods for obtaining recombinant DNA and DNA cloning, the use of plasmids, stages of microclonal propagation and the use of enzymes in various fields. The knowledge gained in lectures serves as a basis not only for individual laboratory work and small group studies in microbiology and biotechnology, but also for all other studies in biology. Completion of the course includes a report on laboratory work and an exam.	4			✓			✓		✓				
		BD	EC	Microbiology and virology	The purpose of the discipline: to determine the diversity, morphology, physiology and metabolism of microorganisms, the practical role of microorganisms in the field of Environmental Protection, medicine and biotechnology.				✓			✓		✓				

					Content: Current Directions, trends in the development of Microbiology. Development in Kazakhstan. Methods of studying microorganisms. Culture Media and their types. Morphological diversity of prokaryotes, types of differentiation. The ultra-structure of prokaryotes. Physiology of microorganisms. Methods of isolation and culture of microorganisms. Classification of prokaryotes. Morphology of eukaryotic microorganisms. Metabolism of microorganisms. Breathing process. Genetics of microorganisms.													
		PD	EC	Plants Physiology	The purpose of the discipline: to learn the Basic Laws of the vital activity of a plant organism and teach them to use them in managing the productivity of agricultural, cultivated plants. Content: the relationship between the structure and function of plant structures. Water regime of plants. Photosynthesis. The light and dark phase of photosynthesis. Photosynthetic phosphorylation. The Calvin cycle. Plant respiration. Anaerobic and aerobic stages. Glycolysis. Krebs cycle. Substrate phosphorylation. Mineral nutrition of plants. Growth and development of plants. Phytohormones. Plant movements. Plant resistance..	3			✓			✓		✓				
		PD	EC	Physiology and Biochemistry of Plants	The purpose of the discipline: the formation of knowledge about biochemical processes in the plant body and their significance in plant life. Content: the laws of the course of life processes of the plant organism and the mechanisms of metabolism in plants. Structure, properties and mechanisms of functioning of the main classes of biological substances in the plant body. Structure and function of proteins. Structure and function of carbohydrates. Structure and function of nucleic acids. Structure and function of lipids. Biologically active substances.				✓			✓		✓				
		BD	EC	Genetics	The purpose of the discipline: the formation of knowledge and ideas about the structure of genes, heredity and variability based on a system of modern methods. Content: Basic Laws of heredity. Methods of studying heredity and variability. Cytological basis of inheritance, gametogenesis. The interaction of genes. Gender	5			✓					✓			✓	

					genetics. Chromosomal theory of heredity. Variability. Human Genetics. Medical Genetics, problems of the inheritance of human blood groups and population genetics.													
		BD	EC	Medical Biology and Genetics	The purpose of the discipline: formation of students ' modern knowledge about the medical, genetic, biological foundations of the vital activity of the body; Content: molecular foundations of heredity, principles and mechanisms for the implementation of hereditary information. Genetic and cellular foundations of individual development of a person in normal and pathology. Genetic variability, mutations, their role in the occurrence of hereditary diseases. Modern methods of molecular genetic analysis of hereditary diseases. Fundamentals of population genetics.				✓					✓			✓	
		PD	EC	Molecular Biology	The purpose of the discipline is to explain the structure of living organisms from a molecular point of view. Content: cells and genomes. Common properties of terrestrial cells. Chemical components of the cell. Features of the construction of a water molecule. The importance of enzymes in metabolism. The importance of activated transporters in the biosynthesis of molecules. NADN and NADF are important electron carriers. The shape, structure and function of proteins. Mechanisms of DNA replication. Chromosomal DNA. The development of genomes. The appearance of genomic changes. Violation of the mechanisms of copying and correcting DNA.	5			✓			✓		✓				
		PD	EC	Molecular Biology with the Fundamentals of Genetics	The purpose of the discipline: the formation of modern knowledge about the main molecular – genetic and cellular mechanisms of life of organisms, their application in clinical practice. Content: composition, structure and significance of nucleic acids. The main ways of transmission of genetic information. DNA biosynthesis. Genetic recombination. Anabolism. Stages of protein biosynthesis. Genetic code. Genetic apparatus of the cell. Karyotype of a person. Violation of genetic homeostasis and manifestation in human pathology. Genetic, genomic, chromosomalmutations. Mutagenesis. Mutagenic factors.				✓			✓		✓				
		PD		Pedagogical	This course is aimed at developing the following areas of	3							✓		✓	✓		

				Approaches (pedagogical practice, 3rd year)/dual	pedagogical competence: -Competence in the field of pedagogy and didactics -Area of competence for interaction -Area of competence for the working environment of teachers -Area of competence for professional development The purpose of this course is the comprehensive development of future teachers, improvement in practice of professional and formation of subject competencies necessary for work as a teacher (preschool teacher, primary school teacher, subject teacher, assistant class teacher/curator).													
	Biodiversity and Environment	PD	EC	Theory of Evolution	The purpose of the discipline is the history of the emergence and development of life on earth , the formation of a scientific understanding of the evolutionary doctrine. Content: the history of the development of evolutionary doctrine. The formation and development of evolutionary ideas in the period before the Darwin era. The evolutionary concept of J. B. Lamarck. Darwin's evolutionary theory. Formation of a synthetic theory of evolution. Evidence of evolution and methods of its study. The doctrine of microevolution. Population is the elementary structure of evolution. Evolutionary progress. Anthropogenesis.	4		✓			✓	✓						
		PD	EC	Evolutionary Biology	The purpose of the discipline: studies the natural communities of living organisms, their connection with inanimate nature and man. Content: organic evolution objective process methods of studying evolution. Life is a special form of movement of matter. Evolutionary change is a necessary condition for life on earth. The next stages of biochemical evolution. Evidence of evolution and methods of its study. The importance of the works of scientists in the formation of views on the integrity and development of living nature. The struggle of transformism and creationism, preformism and epigenesis. Formation of evolutionary biology.			✓			✓	✓						
		PD	EC	Bioresources of Kazakhstan	The purpose of the discipline: to familiarize students with the study, effective use of Bioresources of	4		✓				✓		✓				

					Kazakhstan, the diversity of plants and animals, the stages of the history of research, methods of obtaining raw materials and methods of application. Content: concepts of Biological Resources. Stages of research of raw plants of Kazakhstan. Resource science research approaches and development of raw plants. Effective use and protection of useful plants in the natural flora of Kazakhstan. Resource zoning in Kazakhstan and the prospects of resource scientific work. The main water Bioresources of Kazakhstan.													
		PD	EC	Landscape Science	The purpose of the discipline: the formation of ideas about the climate, relief of the terrain, landscape features and patterns of various zones and zones of territorial nature. Content: understanding and knowledge of the stages of development of the doctrine of landscape Science, the components of landscape Science and its forming factors, morphological natural territorial complexes that make up the landscape, the landscape sphere of the Earth, ecological zoning of the landscape, the boundaries of territorial natural complexes, natural landscapes, their composition and properties, the organization of landscapes, factors of their differentiation. Consideration of the main directions of human influence on the landscape.			✓				✓		✓				
		PD	EC	Biological Ecology	The purpose of the discipline: the formation of knowledge about the laws of life of Biological and social ecosystems, the protection of the habitat, world and local environmental problems. Content: climatic regionality and types of ecosystems. The organism, the conditions of its existence. Influence of limiting factors on organisms. The impact of anthropogenic factors on the environment. Bioecology of populations, communities. Laws of Organization of ecosystems. Environmental succession. Environmental monitoring. Sustainable development of the biosphere. Ways to preserve plant and animal populations.	4		✓				✓					✓	
		PD	EC	Ecological Problems of the RK	The purpose of the discipline: formation of concepts about environmental protection legislation of the Republic of Kazakhstan to solve environmental and environmental problems.			✓				✓					✓	

					Content: problems of Ecology and environmental protection in Kazakhstan. Problems of climate change in the Republic of Kazakhstan. Atmospheric pollutants, radiation situation. General patterns of forest damage and protection measures. Measures for the effective protection of types of Natural Resources. The demographic situation of Kazakhstan and the concept of sustainable development.													
	Biology at School	PD	EC	Natural Science	The purpose of the discipline: The addition of the educational content of students enrolled in the program of biological education in the natural sciences. Contents: Natural Sciences. Areas of natural science. Connection with other objects. Physics, Chemistry, Mathematics, Biology. The diversity of plants and animals in Kazakhstan. Destruction of ecosystems in the context of an administrative and administrative system. Species of plants and animals lost in recent years on the territory of Kazakhstan. Biological diversity and sustainable use of animal and plant resources.	5				✓			✓		✓			
		PD	EC	Methods of Teaching the Discipline of Natural Science in a Small School	The purpose of the discipline: to supplement the content of education of students studying in the educational program biologist in the direction of Natural Science. Content: the content of the discipline methods of teaching Natural Sciences. Research methods. The relationship of the discipline with other sciences. Basic properties of living organisms. Bacteria and fungi. Kingdom of plants. The diversity of the animal world, its origin and evolutionary development. Description of the habitat of animals. Red Book of Kazakhstan. Methodology for the study of representatives of flora and fauna.							✓	✓		✓			
		BD	EC	Organization of Scientific Research Work at School	The purpose of the discipline: organization and planning of research work at school, analysis and conclusion of research methods, results obtained,preparation of articles, practice of artistic presentation of reports. Content: the subject of the Organization of research work at school is the control and management of the cognitive activity of the student, a set of approaches, methods of creation, means of knowledge of the scientific conditions of work on the basis of a planned	4			✓					✓			✓	

					product. Adapting the learning process with experience and the use of information technologies in processing, transportation and accumulation of accumulated material and creating results allows you to implement an individual-oriented learning model.													
		BD	EC	Biological Experiment	The purpose of the discipline: to form an idea of the methodology and methods of scientific research and the organization of biological experiments, research work with students at school. Introduction to biological research methods. The concept of Science and classification of Sciences. Science and scientific worldview. Basic concepts of research work. Stages of research work. Concepts of the method and methodology of scientific research. Philosophical and general scientific methods of scientific research. Statistical processing of experimental results. Basic principles of planning an experimental study.						✓		✓		✓			
		BD	EC	Applied Biology with the Fundamentals of Soil Science	The purpose of the discipline: knowledge of the problems of Applied Biology, ways to increase soil fertility, technology of cultivation of agricultural and ornamental plants and the ability to apply them in the organization of practical work on the educational and experimental site of the school. Content: the relationship of the discipline with biological, chemical and other sciences.Stages of development of Soil Science. Soil reserves of Kazakhstan, general scheme of soil structure and its morphological features. Basic Laws of Land Management. Scientific foundations of agricultural chemicalization. Arable crops. Classification, classification of agricultural crops. Organization of educational and practical contribution. Fundamentals of animal husbandry.work of schoolchildren in animal husbandry.	5			✓			✓		✓				
		BD	EC	Biogeography	The purpose of the discipline: the formation of knowledge about the diversity of the plant and animal world in the environment, the patterns of distribution of species, species features and structures of associations. Content: two branches of Biogeography: the geography of organisms and the general geography of the world of animals and plants (microbacenosis, phytocenosis and				✓			✓		✓				

					zoocenosis geography). Biogeographic regions. Knowledge of the collection and analysis of geographical features of plants and animals; large flora and fauna kingdoms on the continent.													
		PD		Industrial Practice (pedagogical, 4th year)	Objective: Acquisition of practical skills in the field of study, development of the ability to independently make decisions in specific situations, in areas of work. Contents: Conducting laboratory research in solving research and production problems using modern equipment and metering devices; research and production work using regulatory documents. It helps to test and strengthen in practice the theoretical knowledge acquired by students from the university, as well as to improve the connection between educational institutions and production.	10							✓		✓	✓		
Total on MS																		
Minor Program Module																		
	Module of Acquisition of New Professional Competencies	BD	EC	Subjects on the Additional Educationa Program	The purpose of the discipline: the formation of a successful personality image in students, the identification and development of emotional intelligence, stress resistance, volitional behavior and effective use of time. Content: school for the development of emotional intelligence. Sensitivity skills (predicting human behavior) are based on understanding emotions. Modern methods for assessing stress levels. Strategies for the development of voluntary behavior. Will is the main resource that allows you to achieve goals and overcome difficulties. Methods of educating students ' willpower. The nature and types of Student time management.	12	✓	✓			✓							
Total by Module																		
	Module of final Certification	PD		Research and Innovation in Education (pedagogical practice, 4th year)	This course is aimed at developing the following areas of pedagogical competence: -Competence in the field of pedagogy and didactics -Area of competence for interaction -Area of competence for the working environment of teachers -Area of competence for professional development This course aims to develop future teachers' attitudes	8	✓	✓		✓	✓	✓					✓	✓

					towards the development of their own professional activities and work environment. In addition, the course aims to develop skills in collaboration, problem solving and leadership. They deepen their teaching skills and develop research skills as well as practical skills (didactics) in accordance with their specialization.														
		PD		Writing and Defendininng a Thesis, a Graduate Work , or Preparing and Passing a Comprehensive Exam	Purpose: to form an idea of the general provisions on the design and protection of diploma works, preparation for final certification exams. Content: general provisions of the diploma work, selection and approval of the topic of the diploma work, scientific supervision of the preparation of the diploma work, the procedure for the formation of the content (plan) of the diploma work, selection and study of sources of information, collection and processing of practice material, basic requirements for the content and design of the diploma work, Protection of the diploma work, General.	8	✓	✓	✓	✓	✓	✓			✓		✓	✓

5 Summary table reflecting the volume of disbursed loans by EP modules

Trainingcourse	Semester	Number of modules to be mastered	Number ofsubjects studied			Number of credits KZ					Total-hours	Totalcredits KZ	number	
			GC	UC	CC	Theoretical training	Physical culture	Educa-tionalpractice	Manufac-turingpractice	Final Certifi-cation			exam	differentiated credit
1	1	7	4		2	28	2				900	30	6	1
	2	7	3		2	27	2	1			900	30	5	2
2	3	9	1	4	2	27	2		1		900	29	6	3
	4	8		3	3	26	2		2		900	31	6	2
3	5	7	1	2	3	28			2		900	28	6	1
	6	5			4	26			4		900	32	3	1
4	7	9		1	7	33			10		1290	44	6	3
	8	3							5+4	8	510	16		2
итого		55	9	10	23	195	8	1	28	8	7200	240	38	15

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

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

7 Educational and resource support for EP

Educational Information Center	The structure of the Educational Information Center includes 6 subscriptions, 16 reading rooms, 2 electronic resource centers (ERC). The basis of the net work k 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. The library fund is reflected in the electronicatalog available to users on the site http://lib.ukgu.kz on-line 24 hours 7 days a week. The maticdata bases of the irown generation: "Almamater", "Proceedings of SKSU scientists", "Electronic archive" have been created. Online access from any device 24/7 via the externallinkhttp://articles.ukgu.kz/ru/pps. Catalog sareprocessed electronically. EC consists of 9 databases: "Books", "Articles", "Periodicals", "Proceeding soft heteaching staff of SKSU", "Rare Books", "Electronic Fund", "SKGU in Print", "Readers" and "SKU". The EI Cprovidesitsusers with 3 options for accessing it sown 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; remotelyonthelibrarywebsitehttp://lib.ukgu.kz/. Open access to internationaland republic anresources: "Springer Link", "Polpred", "Web of Science", "EBSCO", "Epigraph", to electronic versions of scien tificjournalsinthepublicdomain, "Zan", "RMEB", "Adebiet", Digitallibrary "Aknurpress", "Smart-kitar", "Kitar.кz", etc. For people with special need sanddisabilities, the library website has been adapted to the work of visually impairedusers
Material and technical base	The department has the following classrooms with a total area of 342 m2. Secondary School No. 62 named after N.Torekulov, Shymkent