Ф.7.02-10

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

«APPROVED»
Chairman of the Board-Rector
_____D.Zh.Ahmed-Zaki
«_____»_____2025

EDUCATIONAL PROGRAM

6B01505- Biology (IP)

Registrationnumber	6B01500452
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
Typeof EP	innovative
ISCE level	6
NQF level	6
SQF of education level	6
Language of learning	Kazakh, Russian
Typical duration of study	4 years
Form of study	full-time, edistance 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
Isaev Y. B.	Head of the chair, c.b.s, associate professor	
Rakhimberdiyeva Zh.Sh.	PhD, senior lecturer	
Zhumatayeva U.T.	PhD, senior lecturer	
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	
Nysanbayeva Zh.T.	Director of IT school-lyceum No. 24 named after S. Erubaev	
Kaikenov G.Zh.	Director of School-Gymnasium No. 26 named after Zhambyl	
Almahankyzy R.A.	School - Lyceum № 7 named after K. Spataev	

The OP was considered at a meeting of the Academic Quality Committee of the «Natural Sciences and Pedagogy» Higher School,
Minutes #___ «_____» _____ 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 # « » 2025 y.

Chairman of the EMM_____ E.Imangaliyev

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

Minutes # « » 2025 y.

CONTENT

1 Concept of OP

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 – 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 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	• 6th 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); • 6th Level of European Qualification Framework for Life long Learning).
Connection of the EP with the professional sphere	Professional standard "Teacher" (order of the acting Minister of Education of the Republic of Kazakhstan No. 500 dated 15.12.2022) On the approval of Professional standards for teachers of educational organizations. Order of the Minister of Education of the Republic of Kazakhstan dated February 24, 2025 No. 31
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 objects: observation, description, identification and classification. LO9 Possess modern technologies and interactive teaching methods, taking into account the specifics of teaching biology. LO10 Conduct integrated lessons with elements of STEM education, use CLIL and artificial intelligence technologies, and professional development methods for teachers of subject-language teaching of natural subjects; LO11 To use research, entrepreneurial skills and skills of working in conditions of uncertainty. LO12 Conduct the educational process using various educational technologies, including digital tools and artificial intelligence to adapt educational material and personalize learning.

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 - Ability to apply modern teaching methods and student assessment tools in the learning process, develop professional skills of teachers through reflection, analysis and experimentation (observation).
	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 - To use biological and pedagogical methods in professional activities, to master the methodology of teaching biology, to engage in educational activities among the population in order to increase the level of biological and environmental literacy of society;
	PC6- Ability to design and implement educational solutions using digital technologies, STEM methods and artificial intelligence technologies.
	PC7 - Skill in managing educational robotic and mechatronic systems for automation and interactive learning.

3.1 Matrix for correlating learning outcomes in the EP as a whole with the competencies being developed

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12
SS 1	✓	✓	✓									
SS 2	✓			✓	✓							
SS 3		✓				✓					✓	
SS 4	✓			✓					✓			
SS 5		✓	✓									✓
SS 6		✓									✓	✓
SS 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)											
							PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	Cycle of general education disciplines																	
	Module of Historical and Philosophical Competencies	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. Being. Ontology	5		✓			✓								✓

					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.													
	Module of Socio-Political Knowledge	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 of man, the psychology of self-regulation. Individual	4					✓					✓		

					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.													
	The Basis of Social and Physical 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		✓									✓	✓
		GED	HsC	Entrepreneurship and Financial Literacy	**Course Objective:** To develop financial and entrepreneurial literacy. To introduce students to the fundamentals of entrepreneurial activity. **Content:** To develop skills in creating business plans and evaluating business ideas. To teach the principles of budgeting and tracking income and expenses. To introduce banking products and the basics of credit. To develop the ability to analyze and reduce financial risks. To raise awareness of the tax system and citizens' responsibilities. To foster responsible and rational financial behavior. To cultivate entrepreneurial thinking, initiative, and responsibility.													
		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	3					✓							✓

					M.Auyezova «The Way of Abai» . K. Tokayev «Abai and Kazakhstan in the XXI century», role, significance.													
		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	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	Basics 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.													
		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					✓					✓		✓
ADDITIONAL MODULES BEYOND THE QUALIFICATION FRAMEWORK																		
	Instrumental and Communication Module	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**:**	10	✓										✓	

					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, 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	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	5	✓			✓							✓	

					management. Networks and Telecommunications.Cybersecurity. Internet technologies. Cloud and Mobile technologies. Multimedia technologies. Smart technology. E-technologies. Electronic business. Electronic government.													
INTERDISCIPLINE MODULES																		
	Basics of Psychological and Pedagogical Preparation	BD	HsC	Psychology in Education and Concepts of Interaction and Communication	The purpose of this course is to improve the following areas of pedagogical competence: -Competencies in the field of pedagogy and didactics -The area of competence for interaction Future teachers have knowledge about modern psychological theories and models, as well as about the functioning of personality and its individual properties. They can apply this knowledge in their teaching activities in various educational contexts. Future teachers contribute to the favorable development of students by promoting dialogue, interaction and communication in the educational process. They are able to communicate, interact and collaborate with students' families, as well as through various other types of partnerships and create new relationships suitable for the development of their own teaching activities.	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 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.	2					✓		✓			✓		

	Supporting Learners as Individuals	BD	HsC	Educational Science and Key Theories of Learning	The purpose of this course is to improve the following areas of pedagogical competence: -Competencies in the field of pedagogy and didactics Future teachers study the basics of pedagogical science, such as conceptual ideas about a person, leading to various learning theories and pedagogical models. Based on an understanding of theoretical concepts, future teachers can make appropriate pedagogical choices for various learning situations.	3						✓	✓					
		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							✓		✓	✓		
		BD	HsC	Age and Physiological Features of the Development of Children	The purpose of the discipline: to form modern knowledge among future teachers about the anatomical and physiological features of the body of children and adolescents, relationships with the environment, to equip them with knowledge about the patterns underlying the preservation and strengthening of the health of schoolchildren, maintaining their high efficiency in various types of educational activities. Contents: Growth and development of the body; development of the nervous system, the formation of higher nervous activity and its formation in the process of child development. Features of the development of sensory, endocrine, musculoske	3		✓							✓			
		BD	HsC	Inclusive Educational Environment	The purpose of the discipline: Familiarization with modern world and domestic theories of inclusive education, the formation of professional competencies for future teachers in the design and organization of inclusive education. Content: Social significance and features of inclusive education. Patterns, principles and models of inclusive education, normative legal documents regulating the activities of inclusive education in a mass school. Approaches	4		✓										✓

					and technologies for organizing inclusive education in educational institutions. Methods of psychological and pedagogical support and creation of a comfortable environment for inclusive education of children with special educational needs. The problems of creating an inclusive educational environment.													
		BD	HsC	Teaching Planning and Individualization of Learning	The purpose of this course is to improve the following areas of pedagogical competence: -Competencies in the field of pedagogy and didactics Future teachers are familiar with the educational program in their field of teaching, as well as with the guiding pedagogical principles and cross-cutting themes of developing a certain level of education, such as entrepreneurship and sustainable development. Future teachers have the skills to individualize teaching, taking into account the diversity of students and the principles of inclusion in the learning process, and the use of teaching technologies based on pedagogical and independent research.	4							✓		✓		✓	
	Teaching and Assessment for Learning	BD	HsC	Teaching Methods and Technologies	The purpose of this course is to improve the following areas of pedagogical competence: -Competencies in the field of pedagogy and didactics Future teachers have a comprehensive understanding of teaching strategies and methodologies and can apply them in planning, teaching and evaluation in innovative ways appropriate to specific pedagogical situations, the conditions of a particular school and the capabilities of students. Future teachers are able to create suitable inclusive, physical and online learning environments at different stages of the educational process. Future teachers understand and can apply copyright and data protection rules when planning their teaching materials. Future teachers have the necessary knowledge in the field of didactics, teaching technologies and methods of motivating students, being able to provide the necessary pedagogical assistance to students.	5							✓		✓		✓	
		BD	HsC	Assessment and Development	The purpose of this course is to improve the following areas of pedagogical competence: -Competencies in the field of pedagogy and didactics Future teachers have a deep understanding of the importance of assessment in the learning process and are able to provide constructive assessment in an ethical manner at various stages of the learning process and involve students in assessment.	4							✓		✓		✓	

					Future teachers define, differentiate and use various assessment technologies, principles, stages, tools for evaluating their field of knowledge (including formative and summative assessment and self-assessment and mutual assessment, etc.). They are able to critically evaluate and analyze their understanding and practice regarding assessment, and develop them further.													
		PD		**Pedagogical Approaches (pedagogical practice, 3rd year)/dual**	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 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).	3							✓		✓	✓		
		BD	EC	Pedagogical Research	The purpose of this course is to improve the following areas of pedagogical competence: -Area of competence for professional development This course provides future teachers with a theoretical basis for pedagogical research. Future teachers have the skills to search for and critically select theoretical knowledge from various reliable sources, use research results in the development of their pedagogical thinking and practice, and are willing to promote research-based learning and education, as well as their own continuous development and professional growth.	5								✓		✓		
		BD	EC	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.			✓					✓		✓			

		BD	EC	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		✓					✓		✓			
		BD	EC	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.			✓					✓		✓			
	TEACHER AS A FACILITATOR OF LEARNING	PD	HsC	Digital technologies in biology	The purpose of this course is to enhance the following areas of subject competence: -Competence in conducting scientific research -Application competencies in science -The sphere of competence in the field of pedagogy and didactics -Area of competence for professional development Future teachers are exploring the possibilities of using digital equipment and software in the educational process in biology, planning effective ways of teaching using IT technologies, including in terms of distance learning in biology lessons, and creating digital educational resources in biology	3				✓			✓		✓			
		PD		**Research and innovation in education (4th year pedagogical practice)**	This course is aimed at developing the following areas of pedagogical competence: -Competence in the field of pedagogy and didactics -The area of competence for interaction -The area of competence for the working environment of	10								✓		✓		

					teachers -Area of competence for professional development This course is aimed at forming future teachers' attitudes towards the development of their own professional activities and working 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) according to their specialization.												
	BIOLOGY OF PLANTS	BD	EC	Structure and functions of plant organisms	The purpose of this course is to enhance the following areas of subject competencies: -Competencies of conceptual and theoretical knowledge -Competence in conducting scientific research -Application competencies in science Future teachers have fundamental knowledge in the field of botany, anatomy and morphology of plants, possess terminological apparatus, have skills in working with optical devices, herbarium and fixed materials, and know the technique of preparing micro-preparations.	5			✓			✓					✓	
		BD	HsC	Diversity of plant organisms	The purpose of this course is to improve the following areas of subject competence: -Competence of conceptual and theoretical knowledge -Competence in conducting scientific research -Application competencies in science Future teachers classify plants using knowledge about the main features, characteristics, spatial distribution, ecology and diversity, describe their life forms, introduction, phylogeny of life, study the centers of origin and the practical significance of plant organisms. In the course of studying the discipline, future teachers acquire skills in working with plant determinants, herbarium and collection materials.	5			✓			✓					✓	
		BD	EC	Plant Physiology	The purpose of the discipline: The formation of knowledge about the basic laws of the vital activity of a plant organism and their application in managing the productivity of agricultural and cultivated plants. Content: The relationship between the structure and function of plant structures. The water regime of plants. Photosynthesis. The light and dark phases of photosynthesis. Photosynthetic phosphorylation. The Calvin Cycle. Plant respiration. Anaerobic and aerobic stages. Glycolysis. The Krebs cycle. Substrate phosphorylation. Mineral nutrition of	6			✓			✓					✓	

					plants. The growth and development of plants. Phytohormones. Plant movements. Plant resistance.													
	BIOLOGY OF HUMAN AND ANIMALS	BD	EC	Human and Animal Physiology	The purpose of this course is to develop the following subject competencies: -Competencies in the field of conceptual and theoretical knowledge. -Competencies in conducting scientific research -Applied competencies in science Future teachers study the patterns of development of the animal world from the simplest unicellular forms to highly organized taxa (arthropods, mollusks, chordates), features of morphophysiological organization, phylogeny, embryogenesis, physiology, reproduction, geographical distribution, the role in ecosystems and the practical significance of the main invertebrate species and classes, the importance of biodiversity conservation as a leading factor in ecosystem sustainability. During the study of the discipline, the importance of biology in the formation of a scientific worldview is shown	6						✓					✓	
		BD	EC	Structure and functions of animals 1	The purpose of this course is to enhance the following areas of subject competencies: -Competencies of conceptual and theoretical knowledge. -Competence in conducting scientific research -Application competencies in science Future teachers study the patterns of development of the animal world from the simplest unicellular forms to highly organized taxa (arthropods, mollusks, chordates), features of morphophysiological organizations, phylogeny, embryogenesis, physiology, reproduction, geographical distribution, the role in ecosystems and the practical significance of the main types and classes of invertebrates, the importance of biodiversity conservation as a leading factor in ecosystem sustainability. In the course of studying the discipline, the importance of zoology in the formation of a scientific worldview is shown	5						✓					✓	
		BD	HsC	Structure and functions of animals 2	The purpose of this course is to enhance the following areas of subject competencies: -Competencies of conceptual and theoretical knowledge -Competence in conducting scientific research -Application competencies in science Future teachers know modern information about the	5						✓					✓	

					systematics of vertebrates – their diversity, peculiarities of organization, lifestyle, biology, ecology, phylogeny and fauna of vertebrates of Kazakhstan, as well as the role in ecosystems, the theoretical and practical significance of the main taxonomic groups of vertebrates in nature and human life. Conservation of biological diversity and nature conservation. Future teachers plan and conduct monitoring studies to identify the causes of changes in the number of vertebrates and the influence of various factors (food supply, reproduction, competition, migration, etc.).													
		BD	EC	Human anatomy	The purpose of the discipline: The formation of knowledge about the human structure and its systems based on modern achievements of Macro-microscopic anatomy, anatomical and topographic relations of organs. Contents:Methods of anatomical examination. The doctrine of osteology and muscles, as well as internal organs - Splanchnology. Anatomy and topography of the respiratory system. The doctrine of the blood and vascular system. The structure and topography of the heart. The structure and topography of the central nervous system, the brain and its departments. The doctrine of the glands of internal secretion. The structure and topography of the urinary and sensory systems.	6						✓					✓	
		BD	EC	Human biology	The purpose of the discipline is to form knowledge about the basic laws of morphological and structural features of the human body and its ontogenesis, phylogenetic variability. Contents: Basic methods of studying human biology. The passive part of the motor apparatus is the skeleton. The active motor apparatus of the body is Mythology. The general structure of the digestive system. General characteristics of the structure of the respiratory system. The circulatory system. The structure and topography of the heart. The structure of the nerve, its significance. The central nervous system. Large hemispheres, their structure. The system of endocrine glands. The urinary system. Sensory organs-estesiology.							✓					✓	
	GENETICS AND	BD	EC	Molecular Biology	he purpose of the discipline is to explain the structure of living organisms from a molecular point of view. A brief history of the development of molecular biology. Cells and genomes. Chemical components of the cell. Features of the	5									✓		✓	

	EVOLUTION				structure of the water molecule. The shape and structure of proteins. The function of proteins. Mechanisms of DNA replication. The structure and function of DNA. Chromosomal DNA. The structure and function of chromatin. The general structure of chromosomes. The development of genomes. The occurrence of genomic changes. Violation of the mechanisms of DNA replication and repair.													
		BD	EC	Individual development of living organisms	Purpose: To form knowledge about the laws of biology of individual development, specific features of humans and animals, conditions of their vital activity, reproduction and postnatal development, morphology and physiology of gametes, the main stages of embryonic development. Contents: Biology of individual development of the organism, research methods. Preembryonic development, gametogenesis. Meiosis is the reproduction of germ cells. Features of the sexual cycle. Fertilization. Department of chordates. Blastulation of amphibians. Fragmentation of mammalian eggs. The development of the nervous system. Postembryonic development and the aging process.	4									✓		✓	
		BD	EC	Cytology, histology and embryology	The purpose of this course is to improve the following areas of subject competencies: -Competencies of conceptual and theoretical knowledge Competence in conducting scientific research -Application competencies in science Future teachers have fundamental knowledge about the structure and principles of cell life, subcellular components, their structure and functions, as well as the features of embryonic development. They have skills in working with optical devices, are able to work with histopreparations and fixed materials, and know the technique of preparing micropreparations										✓		✓	
		PD	EC	Patterns of inheritance and variability	The purpose of this course is to improve the following areas of subject competencies: -Competencies of conceptual and theoretical knowledge - Competence in conducting scientific research -Application competencies in science Future teachers have knowledge about the patterns of inheritance of traits, the chromosomal theory of heredity, non-nuclear inheritance, natural and induced mutation process, the basics of genetic engineering, developmental genetics, population and evolutionary genetics, the genetic	6									✓		✓	

					foundations of breeding, the features of human genetics Future teachers determine the relationship between the influence of genotype and environmental factors on the development of the body. Future teachers also consider inheritance in the population, the influence of various factors on the genetic structure of the population													
		PD	EC	Genetics and the basis of breeding	Purpose: Formation of research competence by mastering theoretical knowledge and practical skills in the field of genetics and breeding. Content: Characteristics of the selection process, evaluation of the source material necessary for breeding, by methods of research in breeding science. Scientific analysis of the genetic basis of breeding, determination of the scientific reliability of the centers of origin of cultivated plants and natural selection data, theoretical and methodological basis for understanding nature, completeness and reliability of data.	**3**									✓		✓	
	BIOPEDAGOGY AND ENVIRONMENT	BD	EC	Comparative anatomy and evolution of living organisms	The purpose of this course is to improve the following areas of subject competencies: -Competencies of conceptual and theoretical knowledge - Competence in conducting scientific research -Application competencies in science Future teachers study the historical process of adaptive transformations of wildlife at different levels of organization – from the macromolecular to the biosphere as a whole. The course is aimed at studying comparative anatomical evidence of the evolution of the main types of living organisms. The course pays special attention to the evolution of vertebrates as the most highly organized, studied and economically important group.	6			✓			✓						
				Evolutionary teaching	The purpose of the discipline: The history of the origin and development of life on Earth, the formation of a scientific understanding of the evolutionary doctrine. Contents: The history of the development of evolutionary teaching. Formation and development of evolutionary ideas in the pre-Darwinian period. The evolutionary concept of J. B. Lamarck. The evolutionary theory of Ch. Darwin. The formation of a synthetic theory of evolution. Evidence of evolution and methods of its study. The doctrine of microevolution. The population is an elementary structure of evolution. Evolutionary progress. Anthropogenesis.			✓			✓						✓	
		BD	HsC	Biogeocenology	The purpose of this course is to improve the following areas	6		✓			✓						✓	

					of professional competence: -Competence of conceptual and theoretical knowledge -Competence in conducting scientific research -Application competencies in science Biogeocenology combines a number of disciplines that are related to biology, ecosystem ecology and geography. Future teachers will understand the basic patterns of organization and functioning of biogeocenoses. Future teachers will be able to prove the essence of the complex of living and inanimate components of nature that are in causal interactions, substantiate the totality of complex ecological systems in the biogeosphere, conduct research on the structural components of biogeocenosis, taking into account the forms of species coadaptation in different natural and geographical conditions using collaboration skills													
		BD	EC	Ecology of plants, animals and humans	The purpose of this course is to improve the following areas of professional competence: -Competence of conceptual and theoretical knowledge -Competence in conducting scientific research -Application competencies in science The discipline “Ecology of plants, animals and humans" is associated with the disciplines of ecology, botany, zoology and human anatomy. Future teachers will learn the fundamental concepts of the organism and biological diversity in nature, biogeocenosis as special levels of organization of life. Future teachers evaluate the relationship between organisms and the environment, taking into account the peculiarities of the structure and vital activity of organisms in various environmental conditions of the Earth. They teach planning and monitoring of biological objects and the state of their own body under the influence of environmental factors. Assess the consequences of anthropogenic activities in relation to the natural environment and the health of other people.				✓			✓						
		BD	EC	Bioresources of Kazakhstan	Purpose: To familiarize students with the study of biological resources of Kazakhstan, their rational use, diversity of plants and animals, periods of the history of research, methods of obtaining raw materials and methods of their application. Content: Concepts of biological resources. The stages of studying the raw plants of Kazakhstan. Resource science approaches to the study and development of raw plants.	4						✓						

					Effective use and protection of useful plants in the natural flora of Kazakhstan. Prospects of resource zoning and resource scientific work in Kazakhstan. The main aquatic biological resources of Kazakhstan.													
		BD	EC	Flora and fauna of the world	Purpose: To form scientific ideas about the flora and fauna of the world, to expand knowledge about the diversity of species and about the main representatives of the animal and plant world. Contents: Patterns of distribution of plants and animals of the globe. Characteristics of endemic plants. Features of plants and animals characteristic of the steppes. Plants and animals of the desert zone. Types of mountain plants and animals. The diversity of flora and fauna of the tundra and taiga.							✓						
	APPLIED AND INTEGRATED SCIENCES	PD	EC	Environmental Chemistry	The purpose of this course is to improve the following areas of subject competencies: -Competencies of conceptual and theoretical knowledge -Competence in conducting scientific research -Application competencies in science This course is aimed at acquiring knowledge about the basic principles of environmental chemistry and their actions on a local and global scale. During the course of studying the discipline, future teachers discuss and predict the effects of pollution on the environment, use knowledge in physics, chemistry, Earth sciences and biology to scientifically substantiate the processes occurring in the environment. Future teachers analyze the main physico-chemical processes involving pollutants in the atmosphere, hydrosphere and soil, form a civic position and are responsible for their decisions and actions in the context of Sustainable Development.	4										✓	
				Theoretical foundations of inorganic chemistry	The purpose of this course is to improve the following areas of subject competencies: -Competencies of conceptual and theoretical knowledge -Competence in conducting scientific research -Application competencies in science The course builds students' knowledge of the basic concepts and laws of chemistry, the basics of atomic and molecular theory, the structure of matter, the Periodic Law, chemical bonding, the laws of the chemical process, the doctrine of solutions, metabolic reactions in electrolyte solutions, redox reactions. Future teachers study the basics of chemical thermodynamics, the kinetic foundations of the description of											✓	

					chemical reactions, methods and mechanisms of their acceleration, the doctrine of chemical equilibrium and methods of its displacement, the basics of the theory of solutions, elements of electrochemistry. The proposed course is practice-oriented both in theory and in fact: all concepts, laws and theories, as well as the most important processes, substances and materials are given in terms of their practical significance, etc.												
		PD	EC	Biochemistry	The purpose of this course is to improve the following areas of subject competencies: -Competencies of conceptual and theoretical knowledge -Competence in conducting scientific research -Application competencies in science Biochemistry is an integrated discipline and covers a number of natural science disciplines, including chemistry, genetics, microbiology, forensic science, crop production and medicine. Future teachers study chemical processes in living organisms occurring at the molecular level. They determine the causal relationships between the structure of a molecule and its function, which will allow them to predict the mechanisms of interaction of molecules by studying the structure and properties of proteins, nucleic acids, fats, carbohydrates, as well as cellular organelles. Future teachers also consider the processes of cell interaction during growth or disease control, and study the achievements of science in the field of biochemistry. Future teachers plan and conduct research to determine the impact of various factors	3											✓	
				Bioorganic chemistry	The purpose of this course is to improve the following areas of subject competencies: -Competencies of conceptual and theoretical knowledge -Competence in conducting scientific research -Application competencies in science The course examines the issues and problems of bioorganic chemistry, develops skills for obtaining and identifying organic substances in a living organism. During lectures and laboratory classes, future teachers analyze the relationship between the structure of organic substances and their biological functions, conduct laboratory studies of the structure, properties and functions of biologically important natural (biopolymers, vitamins, hormones, biologically active substances, antibiotics) and synthetic compounds (medicines, pesticides, etc.). Future											✓	

					teachers practice practical skills They work with devices and materials, choose ways and methods of conducting individual and group research, solve creative problems and offer new non-standard solutions for													
		PD	EC	Biophysics and bioinformatics	The purpose of this course is to improve the following areas of subject competencies: -Competencies of conceptual and theoretical knowledge -Competence in conducting scientific research -Application competencies in science Structural and comparative genomics study the location, functions, and evolutionary relationships of genes, while bioinformatics databases are used to compare the structures of biopolymer molecules. Artificial intelligence automates the processing of genetic data, accurately identifying ancestral genes, hidden repeats, and functional regions. This enhances the efficiency of genomic research and accelerates scientific discoveries in biology.	3								✓			✓	
		PD	EC	Scientific foundations of natural science	The purpose of this course is to improve the following areas of subject competencies: -Competencies of conceptual and theoretical knowledge -Competence in conducting scientific research -Competence of application in science The course forms students' knowledge about the modern natural science picture of the world and the methods of natural sciences; they possess the skills to apply the acquired knowledge to explain the phenomena of the surrounding world, the perception of information of natural science content									✓			✓	
		PD	EC	Biomedicine and bioinformatics	Goal- biomedicine zhane bioinfarmatik zertteuler men praktikada biologiyak derekterdi taldau, interpretationalau zhane koldanu ushin zamanaui computerik technologiyalar men mathematicalyk adisterdi igeru. Adam agzasyn kurylymy men functionaryn, aurulardyn mechanism tusinu; Genetics, DNK, RNK, beloktar zhane kletkalyk protesterdin zertteu arkily genetikalyk negizderin anyktau; Immundyk juyi, vaccinal zhane infectionalyk aurular; Aurulardyn taraluyn, sebepterin zhane aserin zertteu, kogamdyk densaulykty aktau ushin prophylaxis sharalar; Biologiyalyk derekterdi (genomdyk, proteomdyk, metabolomdyk derekter) ondeu	4							✓		✓	✓		

					zhane taldau, algorithmder men bagdarlamalyk kamtamasyz etudi azirleu.Biologiyalyk zhuyelerdin kurdeliligin modeldeu zhane tusinu.Derekterdi visualizationau zhane interpretationauadisteri.													
		PD	EC	Experimental Biology	Purpose: Knowledge of the methodology and methods of scientific research, the formation of skills for independent research of the requirements for the rules of planning, conducting laboratory experiments, analysis and creative thinking of the results. Content: Science and scientific research. The basic concepts of research work. Stages of research work. Individual and special methods of scientific research. Experimental research methods. Primary data processing. Statistical processing of experimental results. The specifics of the experimental method, types of experiment, the main stages of preparation and conduct of the experiment.								✓	✓			
		PD	EC	Microbiology with the basics of biotechnology	Purpose: to provide in-depth knowledge about the structure, functions, ecology of microorganisms and the possibilities of their application in biotechnological products and processes. Basic principles of microbiology, types of microorganisms (bacteria, viruses, fungi, protists) and their role in the environment; metabolic processes and genetic structures of microorganisms; definition, history and directions of biotechnology development; interrelation of microbiology and biotechnology; methods of production of biotechnological products (antibiotics, enzymes, vaccines, bioplastics) based on microorganisms; microbiological application of processes (fermentation, bioconversion, bioremediation) ; The role of microbiology and biotechnology in agriculture, medicine, ecology, food production and industry; methods (cultural, molecular, biochemical) and technologies used in microbiological research; skills in data analysis, conducting experiments and planning scientific research.	4								✓	✓		✓	
		PD	EC	Applied biology with	The purpose of the discipline: the formation of knowledge										✓		✓	

				the basics of soil science	about the problems of applied biology, ways to increase soil fertility, technologies for growing agricultural and ornamental plants and skills to apply them in the organization of practical work at the educational and experimental site of the school. Contents: The connection of the subject with biological, chemical and other sciences. Stages of development of soil science. Soil reserves of Kazakhstan. The general scheme of the soil structure and its morphological features. The basic laws of agriculture. Scientific foundations of agricultural chemicalization. Field crops. Classification and grouping of field crops. Organization of an educational and experimental site at the school. Fundamentals of animal husbandry												
	RESEARCH IN BIOLOGY	PD	HsC	Conceptual Biology Training	The purpose of this course is to improve the following areas of subject competencies: -Competencies of conceptual and theoretical knowledge - Competence in conducting scientific research -Application competencies in science -The sphere of competence in the field of pedagogy and didactics -Area of competence for professional development The course content promotes a stronger understanding of biological principles among students, defines the conceptual framework for the content of teaching biology lessons at school and prepares future teachers for the conceptual teaching of biological concepts. The course will help students classify, process and sort information, see and identify patterns in natural phenomena and formulate meaningful relationships between them. Also, by conducting case studies, compiling diagnostic maps, diagnostic tests, conceptual maps, approximate analogies, future teachers will master conceptual learning tools.	4							✓		✓			
		PD	EC	STEM education in biology	The purpose of this course is to improve the following areas of subject competencies: -Competencies of conceptual and theoretical knowledge - Competence in conducting scientific research -Application competencies in science -The sphere of competence in the field of pedagogy and didactics -Area of competence for professional development Future teachers study modern methods and					✓			✓		✓			

					technologies for teaching biology using STEM, aimed at activating and intensifying students' learning activities, as well as diagnostics and assessment. They master subject content through projects that naturally integrate scientific knowledge, design, information technology, and mathematical calculations. Artificial intelligence in these processes assists in promptly diagnosing students' knowledge levels, analyzing learning outcomes, and adapting content to individual needs. Future teachers explore the methodology of organizing STEM education, discuss its stages, apply various research methods in practice, design STEM-based investigations, and develop skills to integrate these into teaching across different learning environments, with AI supporting effective planning and predicting students' interests and achievements based on data.	5											
		PD	EC	Design of STEM education	The purpose of this course is to enhance the following areas of subject competence: -Competence in conducting scientific research -Application competencies in science -The sphere of competence in the field of pedagogy and didactics -Area of competence for professional development Future teachers study the features of designing STEM learning based on an applied nature to real–world problems, learning through problem solving and critical thinking, and integrating different content with active inclusion in the educational process. The course builds the ability to use new technological opportunities in biology, as well as to design and adapt STEM education taking into account the diversity of students.					✓			✓		✓			
		PD	EC	Modern approaches to the organization of a biological experiment	The purpose of this course is to enhance the following areas of subject competence: -Competence in conducting scientific research -Application competencies in science Future teachers study modern approaches to the organization of experiments in the field of biological sciences, the stages of conducting, aspects of the organization and planning of experiments, methods of data processing, ways of presenting the results of the	5					✓	✓					✓	

					experiment. Special emphasis is placed on molecular genetic approaches to the organization of experiments. The discipline is aimed at developing the skills of conducting biological experiments using modern approaches and using experiments in their professional and research activities.														
		PD	EC	Methodology of biological research	The purpose of this course is to enhance the following areas of subject competence: -Competence in conducting scientific research -Application competencies in science -The sphere of competence in the field of pedagogy and didactics Future teachers study the methodology of organizing scientific research in the field of biology, the stages of research, the variety of research methods in biology, methods of processing research data, ways of presenting research results. The course is aimed at developing skills in working with scientific equipment, conducting theoretical and applied research.						✓	✓					✓	
		PD	EC	Research and project activities in biological education	The purpose of this course is to enhance the following areas of subject competence: -Competence in conducting scientific research -Application competencies in science -The sphere of competence in the field of pedagogy and didactics he area of competence for interaction -Area of competence for ofessional development Future teachers study the methodology project activities in education, the method of projects in odern schools, the practice of educational design, the ganization and stages of project activities of schoolchildren, the int work of a teacher and students. The discipline is aimed at veloping work skills within the framework of research and oject activities.							✓						✓
		PD	EC	Academic letter	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	5	✓											✓

					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.													
		PD	EC	Content-language integrated learning in biology	The purpose of this course is to improve the following areas of subject competencies: -Competencies of conceptual and theoretical knowledge. -Competence in conducting scientific research -Application competencies in science -The sphere of competence in the field of pedagogy and didactics -The area of competence for interaction -Area of competence for professional development Future teachers will study the main approaches, techniques, techniques and forms used in integrated subject-language teaching of biology. The discipline is aimed at acquiring knowledge of biology, while improving language knowledge and skills		✓											
Итоговая аттестация																		
	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 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.	8	✓	✓		✓	✓	✓					✓	✓
		PD		Preparation and presentation of the diploma paper (project) or two comprehensive exams	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	**8**	✓	✓	✓	✓	✓	✓			✓		✓	✓

					requirements for the content and design of the diploma work, Protection of the diploma work, General.													

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	different iated 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	30	6	1
	6	5			4	26			4		900	30	3	1
4	7	9		1	7	33			10		1290	44	6	3
	8	3							5+4	8	510	16		2
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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	**Current control** on each topic of the discipline, control of knowledge in classroom and extracurricular classes (according to syllabus). Assessment forms:

learning outcomes	• 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.kz", 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

APPROVAL SHEET

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