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1. CHARACTERISTIC OF THE EDUCATIONAL PROGRAM

The purpose of the educational program: Training of qualified personnel with fundamental knowledge in the field of chemistry and biology in combination with the requirements of advanced innovative learning technologies.

1.1 GENERAL INFORMATION

Type of educational program	current
Name of the educational program	6B01508 - Chemistry-Biology
Field of education	6B01 Pedagogical sciences
Training direction	6B015 Training of teachers in natural science subjects
The group of the educational program	6B012 Training of teachers of chemistry
License to engage in educational activities	The educational program is implemented on the basis of the appendix to the License No. KZ75LAA00018542 dated August 04, 2020 in the direction of personnel training 6B015 Training of teachers in natural science, issued by the RSU "Committee for Quality Assurance in the field of Education and Science of the Ministry of Education and Science of the Republic of Kazakhstan".
Number and Date of Registration/ Update in the Register of EP	
UNT Subjects	Chemistry Biology
Educational level by NQF	Bachelor's Degree, level 6
Awarded degree	Bachelor of Education in the educational program «6B01508 - Chemistry-Biology»
Accreditation	ARQA, certificate № HE-SA 000259, 01.06.2022 y.
Rating of the educational program	-
The total amount of academic credits	240
Study duration	4 years

1.2 VISION, MISSION, PROGRAM GOAL, VALUES, UNIVERSITY GRADUATE ATTRIBUTES

Vision:

An intellectual platform that develops educators who are open to new ideas and able to lead in a rapidly changing world.

Mission:

Developing teacher leaders, who can create, develop, and disseminate advanced knowledge and values in education for the benefit our country and the world.

Program goal:

Our University aims to become a hub for innovative teaching, learning, research as well as the development of rural education in Central Asia.



Values:

Integrity, commitment, care.

University graduate attributes:

- Self-guided learners and reflexive practitioners
- Responsible personalities with moral and ethical values
- Professionals with deep subject knowledge and digital skills
- Creative and critical thinkers and excellent team players and communicators
- Adaptive leaders in teaching and learning
- Diverse, inclusive and for equality of opportunity in society

1.3. THE RATIONALE BEHIND THE EDUCATION PROGRAM

The relevance of the educational program is explained on the one hand by the active development of the chemical-biological direction based on the integration of the two sciences, taking into account interdisciplinary connections. On the other hand, by increasing the competitiveness of dual-profile personnel, including in the field of education

Market demand. The need for teachers of two subjects, such as chemistry and biology, is relevant, especially in the context of the updated content of secondary education, requiring a teacher who is motivated for his or her professional activity, mobile, socially active and in demand on the labor market.

Also, in daytime general education schools, the need for teaching staff of chemistry and biology subjects in the Republic of Kazakhstan is growing from year to year, which indicates the need to train teachers of chemistry and biologists. Thus, despite the positive changes in the system of training and development of teachers, there are still a number of problems that negatively affect the attraction and retention of qualified teachers. In this regard, the Program provides measures to solve problems in the development of the country's pedagogical potential.

By 2023, teacher training programmes will be fully updated to reflect the professional standard.

By chemistry:

There are 285,996 teachers in public general education schools, of which the total number of chemistry teachers is 6,367.

The total number of teachers with a master's degree in public general education schools is 5,029, of which 255 are chemistry teachers.

The need for teachers in state general education schools is 5,2676, of which 315 are in chemistry (Akmola - 45, Aktobe - 19, Almaty - 18, Atyrau - 21, West Kazakhstan - 6, Zhambyl - 23, Karaganda - 72, Kostanay -1, Kyzylorda -0, Mangistau -11, Pavlodar - 4, North Kazakhstan - 29, Turkestan - 10, East Kazakhstan -18, Astana -3, Almaty -1, Shymkent -0).

By biology:

There are 285,996 teachers in public general education schools, of which the total number of biology teachers is 9,651.

The total number of teachers holding a master's degree in public general education schools is 5,029, of which 293 are biology teachers.

The need for teachers in state general education schools is 5,2676, of which 136 are in biology (Akmola - 5, Aktobe - 2, Almaty - 0, Atyrau - 0, WKO - 60, Zhambyl - 2, Karaganda - 9, Kostanay - 0, Kyzylorda -11, Mangistauskaya-7, Pavlodar-1, North Kazakhstan region - 2, Turkestan - 1, East Kazakhstan region -1, Astana -2, Almaty -0, Shymkent -0).



(Source: NOBD data: JSC "Information and Analytical Center", National Collection "statistics of the education system of the Republic of Kazakhstan").

1.4. DISTINCTIVE FEATURES OF THE EDUCATIONAL PROGRAM

Academic mobility	Niide University (Niide, Turkey)
	E.A. Buketov Karaganda State University (Karaganda, Kazakhstan)
	South Kazakhstan State Pedagogical University (Shymkent, Kazakhstan)

Coincidence with similar EP of leading universities in the near and far abroad

Stanford University – 21%,
Belarusian State University – 52%,
Lomonosov Moscow State University – 52%,
Autonomous University of Sinaloa – 36%,
University of Auckland – 30 %

1.5. GRADUATE CAREER OPPORTUNITIES

Professional activities:

Bachelors of education under the educational program 6B01508 "Chemistry - Biology" can perform the following types of professional activities:

- **educational (pedagogical)** - training and development of students, organization of the process of education and upbringing, design and management of the pedagogical process, diagnostics, correction, forecasting of the results of pedagogical activity; conducting classes in schools, technical and professional educational institutions; implementation of methodological knowledge and applied skills in a specific situation;
- **educational (учебно-воспитательная)** - implementation of educational work in accordance with the laws, regularities, principles, educational mechanisms of the pedagogical process; planning extra-curricular educational work; solving specific educational tasks; establishing relations with the students' team, teachers working in the classroom, with parents;
- **educational and technological** - use of the latest pedagogical technologies in the educational process; participation in the organization of the technological process of production and processing of information resources using information and communication means and technologies.
- **social and pedagogical** - creation of favorable conditions and provision of pedagogical support for students' full life activity, upbringing and development;
- **experimental research** - study of scientific and methodical literature; study and generalization of advanced pedagogical experience in chemistry; conducting pedagogical experiments with the introduction of their results in the educational process;
- **organizational and managerial**-planning the content of chemistry at different levels; determining ways to organize and conduct the educational process;

Employment Opportunities:

- educational institutions: teachers of chemistry and biology at general education schools, lyceums, gymnasiums, colleges, technical and vocational education institutions;



- organizations of science: laboratory assistant, senior laboratory assistant, engineer in research centers (in the field of chemical, biological and pedagogical profiles, etc.);
- management organizations: an inspector, a specialist of the department of education departments, akimats, government agencies at various levels.

1.6. AREAS OF PROFESSIONAL COMPETENCE

Area of professional competence 1

Professional competence of an employee in the field of chemistry who has deep knowledge of fundamental and applied chemistry, actively applying them in various professional and research fields of activity.

Area of professional competence 2

Professional competence of an employee in the field of biology, effectively using research methods at the biological and molecular level, optimally applying them in solving urgent problems.

Area of professional competence 3

Professional competence of a teacher as its integral characteristic, including subject, psychological, pedagogical, methodological components of readiness for professional activity.

1.7. EDUCATIONAL PROGRAM LEARNING OUTCOMES:

LO 1 - Applies a variety of communication formats taking into account socio-cultural diversity, adheres to the principles of equality and accessibility in education, to create a prosperous and inclusive environment, has leadership qualities and is able to apply them to develop collective potential

LO 2 - Possess high-level critical and creative thinking skills, are capable of self-regulation and reflection to solve professional problems

LO 3 - Demonstrate knowledge of and adherence to ethical and legal norms in research and use of digital technologies. Apply security measures when working with digital information and data protection, promote the active, safe and ethical use of digital resources.

LO 4 – Knows the basics of fundamental concepts and laws of chemistry, atomic and molecular theory, structure and physico-chemical properties of substances.

LO 5 – Has the skills of staging, planning chemical and biological experiments using the latest achievements of science and technology, knows and complies with safety regulations in chemical and biological laboratories.

LO 6 – Analyzes, interprets and processes experimental results of the work.

LO 7 – He is oriented in the information and conceptual field of natural science knowledge, knows how to use them to solve various practice-oriented tasks of a scientific laboratory and educational nature.

LO 8 – Connects the programs of educational material of chemical and biological disciplines with everyday life and promotes the development of interest in the study of chemistry and biology among students.

LO 9 – Applies the principles of distribution, systematization, evolution and phylogenetic relationships of plants, animals and microorganisms in the environment in the learning process.

LO 10 – Can apply knowledge of the theoretical and experimental foundations of teaching chemistry and biology in the management of the educational process with innovative technologies.



Matrix for correlating EP learning outcomes with graduate attributes

	LO 1	LO 2	LO 3	LO 4	LO 5	LO 6	LO 7	LO 8	LO 9	LO 10
GA1	+	+			+	+	+		+	+
GA 2	+	+								
GA 3				+	+	+	+	+	+	+
GA 4			+							
GA 5		+						+		+
GA 6	+	+	+							

1.8. REFERENCES

The educational program is developed based on the following legal acts:

1) The State mandatory standard of higher and Postgraduate education, approved by the Order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 No. 2. Registered with the Ministry of Justice of the Republic of Kazakhstan on July 27, 2022 No. 28916.

2) The professional standard "Teacher" approved by the order of the Acting Minister of Education of the Republic of Kazakhstan dated December 15, 2022 No. 500. Registered with the Ministry of Justice of the Republic of Kazakhstan on December 19, 2022 No. 31149.

3) Methodological recommendations on the organization and conduct of pedagogical practice for students of the field of education "pedagogical sciences. Order No. 125 of 27.03.2023



2. CONTENT OF THE EDUCATIONAL PROGRAM

№	Code and name of modules	Total credits by module	№	Name of subject and code	Credits by subjects	Cycle/component
1	GES -1 General educational subjects module	36	1	GES 101 History of Kazakhstan	5	GC/ CC
			2	GES 102 Philosophy	5	GC/ CC
			3	GES 103 Social and Political Knowledge Module (Sociology, Cultural Studies, Political Science, Psychology)	8	GC/ CC
			4	GES 1(2)04 Physical Culture	8	GC/ CC
			5	GES 205 Information and Communication Technologies	5	GC/ CC
			6	1. GES 106/1 Fundamentals of Legal Literacy and Anti-Corruption culture / 2. GES 106/2 Ecology and Sustainable Development 3. GES 106/3 Fundamentals of Economics and Entrepreneurship / 4. GES 106/4 Fundamentals of Leadership and receptivity to innovation / 5. GES 106/5 Emotional Intellect 6. GES 106/6 Fundamentals of mathematical statistics 7. GES 106/7 Financial literacy	5	GC/ OC
			7	GES 106/7 Financial literacy		
2	GLC -2 Language communication module	25	1	GLC 101 Kazakh (Russian) Language	10	GC/ CC
			2	GLC 102 Foreign Language	10	GC/ CC
			3	GLC 203/1 English for Academic Purposes GLC 203/2 Academic writing	5	CC/ OC
3	GER – 3 Global Ethics and Research module	21	1	GER 201 Inclusive Education	6	CC/ UC
			2	GER 402 Fundamentals of Educational research	6	CC/ UC
			3	GER 303/1 Professional ethics and identity GER 303/2 Basics of artificial intelligence	4	CC/ UC
4	GPS – 4 General pedagogical subjects module	19	1	GPS 201 Educational psychology	6	CC/ UC
			2	GPS 202 Pedagogy and didactic	6	CC/ UC
			3	GPS 303 Criteria Assessment Technology	5	CC/ UC
			4	PPP 205 Psychology and pedagogical practice	2	CC/ UC
5	FGCh -5 Fundamentals of general Chemistry	35	1	FGCh-101 - Inorganic chemistry	6	CC/ UC
			2	FGCh-202/1 - Analytical chemistry FGCh-202/2 - <i>Quantitative and qualitative analysis</i>	6	CC/ OC
			3	FGCh-203 - Organic chemistry of aliphatic compounds	5	CC/ UC
			4	FGCh-304 - Organic chemistry of cyclic compounds	5	CC/ UC
			5	FGCh-305/1 - Physical chemistry	6	CC/ OC



				FGCh-305/2 - <i>Substante structures</i>		
			6	FGCh-306/1 - Methods of solving tasks in chemistry	6	CC/ OC
				FGCh-306/2 - <i>Olympiad tasks in chemistry</i>		
			7	CT(IP 104/1) Continuous Training (Introductor) practice	1	CC/ UC
6	PAB-6 Plant and animal biodiversity	26	1	PAB-101 Botany	5	CC/ UC
			2	PAB-202 Zoology	5	CC/ UC
			3	PAB-203/1 Cytology, histology and embryology	5	CC/ OC
				PAB-203/2 <i>Cellular pathology</i>		
			4	PAB-204/1 Ecophysiology	5	CC/ OC
				PAB-204/2 <i>Teaching about the environment</i>		
			5	PAB-405/1 Evolutionary Doctrine	5	MC/ OC
PAB-405/2 <i>Anthropology</i>						
6	CT(IP 104/1) Continuous Training (Introductor) practice	1	CC/ UC			
7	SHDLO-7 Structure, heredity and development of living organisms	22	1	SHDLO -301/1 Human anatomy	5	CC/ OC
				SHDLO -301/2 <i>Biology of individual development</i>		
			2	SHDLO -302 Genetics	6	CC/ UC
			3	SHDLO -303/1 Biochemistry	6	MC/ OC
				SHDLO -303/2 <i>Basics of Enzymology</i>		
4	SHDLO -404/1 Molecular Biology	5	MC/ OC			
	SHDLO -404/2 <i>Biology of Nucleic Acids</i>					
8	TME -8 Theory and Methodology of Education	34	1	TME- -301 Methods of teaching chemistry	5	MC/ UC
			2	TME- -302 Methods of teaching biology	5	MC/ UC
			3	PP 303 Pedagogical Practice	6	CC/ UC
			4	P(P)P 404 Production (pedagogical) practice	16	MC/ UC
			5	P(P)P 405 Pre -diploma (pedagogical) practice	2	MC/ UC
9	FSR-9 Fundamentals of synthesis and research	14	1	FSR-401/1 Physico-chemical research methods	4	MC/ OC
			2	FSR-401/2 <i>Современные методы анализа</i>		
			3	FSR-402/1 Химическая технология	5	MC/ OC
			4	FSR-402/2 <i>Химическая технология неорганических веществ</i>		
			5	FSR-403/1 Химический синтез	5	MC/ OC
			6	FSR-403/2 <i>Методы синтеза новых химических веществ</i>		
10	Final certification	8	1	WDDP(P)PCE 401 Writing and defending a diploma paper (project) or passing a comprehensive exam	8	FA
TOTAL:		240			240	



2.1. DESCRIPTION MODULES AND DISCIPLINES

GES-1 GENERAL EDUCATION SUBJECTS MODULE							
Description of the module: The module is represented by a set of compulsory disciplines that contribute to the development of information literacy in all spheres of one's life and activity. The disciplines of the module are aimed at the formation of the ideological, civil and moral positions of the future specialist, competitive on the basis of knowledge of information and communication technologies, orientation towards a healthy lifestyle, self-improvement and professional success. Students get a general understanding of the development of philosophy and the influence of the methodology of reflection on the development of science, interprets the content and specific features of the mythological, religious and scientific worldview, analyze the main stages of the historical development of Kazakhstan.							
№	Name of subject and code	Cycle/component	Credits	Subject discription	Teaching methods	LO by EP	Assessment methods
1	GES 101 History of Kazakhstan	GC/ CC	5	The purpose of the discipline is to provide objective knowledge about the main stages of the development of the history of Kazakhstan from ancient times to the present. As a result of training, students will be able to: demonstrate knowledge and understanding of the main stages in the development of the history of Kazakhstan; to correlate the phenomena and events of the historical past with the general paradigm of the world-historical development of human society through critical analysis; possess the skills of analytical and axiological analysis in the study of historical processes and phenomena of modern Kazakhstan; be able to objectively and comprehensively comprehend the immanent features of the modern Kazakhstani model of development; systematize and give a critical assessment of historical phenomena and processes of the history of Kazakhstan.	the Case study method; brainstorming; Fishbone methods; guest lectures; teamwork; the mental map method	LO 2	essay, presentation, oral exam
2	GES 102 Philosophy	GC/ CC	5	The aim of the subject is to form a holistic view of philosophy as a special form of knowledge of the world, its main sections, problems and methods of their study in the context of future professional activity. describe the main content of ontology and metaphysics	Role-playing games; business games; project development; trainings; brainstorming	LO 2; LO 3	Test; Essay discussion



				in the context of the historical development of philosophy;			
3	GES 103 Social and Political Knowledge Module (Sociology, Cultural Studies, Political Science, Psychology)	GC/ CC	8	The aim of the program is to form the social and humanitarian worldview of students in the context of solving the problems of modernizing public consciousness. Students will learn about the relationship between these disciplines and their influence on the formation of individuality, social relations, cultural values and the political system. The discipline develops analytical thinking, the ability to think critically and understand complex social phenomena, and also contributes to the formation of tolerance and civic activity of students.	Cases; Presentation; questions and answers; group exercises; Interactive methods	LO 1; LO 2; LO 3	Test; case analysis; presentation defense, discussion of the article; Reports
4	GES 1(2)04 Physical Culture	GC/ CC	8	The purpose of the program is to develop the physical qualities of students' motor culture by using of health-saving technologies. Students will be able to develop the skills of physical, psychophysical and personal qualities, self-diagnosis, teamwork through various sports, improving motivation for a healthy lifestyle and preparing for professional activities	demonstrative method; practical approach method; training	LO 1; LO 2	control tests, differentiated credit
5	GES 205 Information and Communication Technologies	GC/ CC	5	The aim of the program is to develop the ability to critically evaluate and analyze the processes, methods of searching, storing and processing information, methods of collecting and transmitting information through digital technologies. Students master the skills of searching and evaluating information resources, ensure data security and communicate effectively using technology. They apply their knowledge to solve problems, demonstrate critical thinking and independence in the use of information and communication technologies.	Problem-based learning method; discussion; project method; case study	LO 1; LO 2; LO 3	Test, Project
6	GES 106/1 Fundamentals of Legal Literacy and	GC/ OC	5	The course is aimed at the formation of a legally competent, law-abiding person. Students will be aware of their rights and responsibilities, show zero tolerance	the Case study method; brainstorming;	LO 1; LO 2; LO 3	Essays; presentations; written exam



	Anti-Corruption culture			for corruption. Students will be able to apply the social, legal and ethical norms of Kazakhstani society in their activities. The course develops an understanding of the rule of law, ethical principles and principles of combating corruption in society.	Fishbone methods; guest lectures		
	GES 106/2 Fundamentals of Ecology and Safe life			The discipline forms students' modern environmental education and culture, develops skills in applying methods to improve the safety of technical means and technological processes for safe life. Reveals the basic laws of the functioning of ecosystems of various levels of organization, the biosphere as a whole, the contradictions that arise in the relationship between man and nature, as well as the need for respect for nature and ecology.	Case, fishbone, Table T, "JIK SO" method, "Venn Diagram" method, "Cluster" method	LO 1; LO 2; LO 3	Oral interview. Essay. Exam (written, test)
	GES 106/3 Fundamentals of Economics and Entrepreneurship			The discipline is focused on the formation of students' skills of entrepreneurship and business thinking. Through a comprehensive view of the laws of the functioning of the economy, the conditions for doing business, its internal and external environment, students will have the skills to develop a business plan, create and successfully run their own business.	the Case study method; brainstorming; Fishbone methods; guest lectures; project method	LO 1; LO 2; LO 3	Essays, presentations, projects, test
	GES 106/4 Fundamentals of Leadership and receptivity to innovation			The course contributes to the disclosure and development of leadership qualities in the personality of each student, the development of innovative susceptibility skills in him, as a process of adaptation to innovations caused by innovative processes, as well as the use of the results of scientific and technical processes in his life and professional activities. Studies the current state and prospects for the development of leadership qualities and the human factor in management.	Inverted learning, situational learning (case collection), technological learning (padlet board, canvas application, comics, kakhot, etc.)	LO 1; LO 2;	Orally (solving cases)
	GES 106/5 Emotional intelligence			The discipline is aimed at mastering the role of a tutor by a teacher in the context of strategic guidelines and priority directions of the state educational policy of	role-playing games; educational discussions; case	LO 1; LO 2; LO 3	Criteria-based assessment



				Kazakhstan. Students determine the place of emotional intelligence and "flexible competencies" in the educational process of a modern school. They apply modern methods and technologies of organizing educational activities, taking into account the development of flexible skills, including in the digital environment. They possess technologies for assessing and developing the emotional intelligence of students of different age groups.	study; project method		method; Project protection
	GES 106/6 Fundamentals of mathematical statistics			The purpose of the discipline is to familiarize students with the forms and laws of consistent thinking, to teach students to think consistently, to contribute to the development of skills of sound argumentation; Students understand the process of collecting, processing data and transmitting ideas, develop skills in using quantitative and qualitative data analysis in assessing the state of the object or phenomenon in question.	Explanation; Case study; Group and pair work.	LO 1; LO 2; LO 3	A written exam.
	GES 106/7 Financial literacy			The discipline is focused on the development of students' knowledge about the financial system, financial institutions and their products, and financial risks. As a result, students will be able to find, analyze, interpret, evaluate financial information from various sources and use it to solve financial problems. In general, the course forms students' competent rational financial behavior in conditions of increased risk of financial fraud.	Explanation; Case study; Group and pair work	LO 1; LO 2; LO 3	Test

GLC-2 Language Communication

Module description: As part of the module, students develop the ability to interpersonal, social and professional communication in Kazakh, Russian and foreign languages. Students develop practical skills in oral communication in a non-native language, writing and academic writing.



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№	Name of subject and code	Cycle/component	Credits	Subject description	Teaching methods	LO by EP	Assessment methods
1	GLC 101 Kazakh (Russian) Language	GC/ CC	10	The discipline is aimed at continuing the development of language training in the Kazakh (Russian) language. The purpose of the discipline is a confident command of the language, the ability to use it for professional and educational purposes. Students develop the skills of competent and effective communication in the language, expand their vocabulary, improve grammar and spelling literacy, academic writing skills.	ICT technologies; technology of problem-search learning; test technologies	LO 1; LO 3	Test
2	GLC 102 Foreign Language	GC/ CC	10	The purpose of the discipline is to expand and consolidate students' communication skills in a foreign language for various purposes. During the study of the discipline, students train and improve the skills of listening to foreign speech, speaking, writing and grammar, enriching personal and professional potential. In the process of studying the discipline, students expand their cultural horizons, develop cross-cultural communication skills.	Communicative; ICT technologies	LO 1; LO 3	Test
3	GLC 203/1 English for Academic Purposes	CC/ UC	5	The subject forms knowledge about the genre varieties of the scientific style, mastering modern methods of collecting, storing and processing information and materials in the field of professional activity, as well as the development of skills and abilities of academic communication in four types of speech activity: reading, speaking, writing, listening	RWCT strategies, Content analysis technologies	LO 1; LO 2; LO 3	Essay
4	GLC 203/2 Academic writing	CC/ UC		The discipline develops students' skills in functional style and writing scientific articles, industry-specific subject terminology, office management, and academic literacy. Students also learn how to compile scientific reports, professional text analysis, critical thinking, plagiarism prevention and information	RWCT strategies, Content analysis technologies	LO 1; LO 2; LO 3	Essay



				retrieval in scientific databases, and systematization of written work.		
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GER – 3 Global Ethics and Research							
<i>Module description:</i> The disciplines of the module are aimed at the formation of global competencies applicable in professional activities. Students accept as a value of building a global, inclusive society and contribute to building and supporting it. Students are introduced to scientific research in the professional field, basic methods of data collection and analysis, professional ethics of behavior and research in the professional field. Students identify and associate themselves with a representative of the professional field and plan their professional development, motivated to learn throughout life to build competencies and increase value in the labor market.							
№	Name of subject and code	Cycle/component	Credits	Subject description	Teaching methods	LO by EP	Assessment methods
1	GER 201 Inclusive Education	CC/ UC	6	The discipline is aimed at the formation and development by students of an understanding of the principles of an inclusive society, where each of its members feels their value and significance. Students are well aware of age-related physiology, anatomy, understand the principles of cognitive skills based on in-depth knowledge of age-related physiology, know how to work with children with OOP, know strategies for creating an inclusive educational environment and know how to build it.	Problem-Based Learning, Flipped Learning, reflexive learning, interactive learning, problem lecture, business game, solving pedagogical situations, group and individual project, presentation, abstract	LO 1; LO 2; LO 3	Oral written and exam, individual and group presentation, individual and group project, quiz
2	GER 303/1 Professional ethics and identity	MC/ UC	5	The purpose of the discipline is to acquaint students with the attitudes, values, knowledge, beliefs and skills adopted in the professional pedagogical environment. Students develop leadership and proactivity skills in the context of pedagogical activity or outside it, develop a commitment to the national and cultural values of Kazakhstan, get acquainted with and accept as a value the strict observance of professional ethics. Students plan their career path, develop introspection and self-management skills.	Method of discussion; Feedback method; Seminar method; Case study.	LO 1; LO 2; LO 3	Written exam



3	GER 303/1 Basics of artificial intelligence	MC/ UC		The aim of teaching this discipline is to form theoretical knowledge and practical skills in artificial intelligence (AI), including implementing the contemporary tools and methods of AI. Students will be introduced to fundamental AI concepts, study its basic principles and methods, gain the skills to apply these theories, methods, and principles in simple intelligent software systems	Method of discussion; Feedback method; Seminar method; Case study.	LO 1; LO 2; LO 3	Written exam
4	GER 402 Fundamentals of Educational research	CC/ UC	10	The discipline is aimed at developing research skills in the field of pedagogical research. Students know the basic qualitative and quantitative research methods, analyze scientific literature, and use the methodology of Action research, lesson study, observation and reflection. Students can process data and draw up research results for presentation to the public orally and in writing.	Project-based learning	LO 1; LO 2; LO 3	Defending a small-scale research

GPS – 4 General pedagogical disciplines

Description of the module: The module is compulsory for pedagogical specialties and represents the basics of the discipline, in which the theoretical foundations of the teaching profession are studied. Students get acquainted with the general sections of pedagogy, psychology in the module is presented with flexible content, which is profiled for use in a pedagogical context and is a response to the needs of the modern school.

№	Name of subject and code	Cycle/component	Credits	Subject description	Teaching methods	LO by EP	Assessment methods
1	GPS 201 Educational psychology	CC/ UC	6	The purpose of the discipline is to form knowledge in the field of psychology of training and education at different age stages. Students will form a clear understanding of the psychological ways of motivating students to succeed in school and the assessment of the quality of cognitive processes. Students will form communicative competencies in the teacher-student-parent system, through the assimilation of constructive communication models. By the end of the course, they will acquire the skills of critical	Demonstration method; Method of discussion; Feedback method; Seminar method; Case study.	LO 1; LO 2; LO 3	Oral questioning, written exam



				assessment of psychological and pedagogical approaches in education.			
2	GPS 202 Pedagogy and didactic	CC/ UC	6	The purpose of the discipline is to form general ideas about pedagogy as a science and the concept of research-based teaching. Students study the historical prerequisites for the development of pedagogical science, understand the basic laws and principles of didactics. Students search for and analyze relevant scientific information using digital tools, are able to argue a point of view based on the fundamental foundations of pedagogy and didactics.	Problem-based learning, SWOT analysis, situational learning, RWCT strategies	LO 1; LO 2; LO 3	Test
3	GPS 303 Criteria Assessment Technology	CC/ UC	5	The discipline teaches the practical application of technology in the educational process. Course is forms the skills of developing formative and summative tasks and criteria for assessing the achieved learning outcomes, based on the taxonomy of educational goals and in accordance with the level of education of the student; - teaches the relationship between the purpose, requirements, methods and learning outcomes; - reveals the concept of a rating control system.	Problem-based learning, Flipped Learning, reflexive learning,	LO 1; LO 2; LO 3	Written exam
4	PPP 205 Psychology and pedagogical practice	CC/ UC	2	The practice is aimed at the formation and integration in the activities of students of the main psychological and pedagogical components of the professional activity of a teacher. Development of skills for analyzing the psychological components of the lesson and their construction in their own pedagogical activities. Preparation of the student for the analysis of professional activity and activation of the process of professional and personal self-development.	Practical method. Collection and analysis method	LO 8; LO 10	

FGCh -5 Fundamentals of General Chemistry

Description of the module: The module is a fundamental basis for the study of chemistry and is a discipline in which the theoretical foundations of general chemistry are studied. Students learn the basics of inorganic, analytical, organic and physical chemistry, develop creativity and learn how to use it in solving problems in several alternative ways.



№	Name of subject and code	Cycle/comp onent	Credits	Subject discription	Teaching methods	LO by EP	Assessment methods
1	FGCh 101 Inorganic chemistry	CC/ UC	6	The discipline is aimed at the formation of professional competence in the field of inorganic chemistry, the interpretation and generalization of modern information about new inorganic compounds, and the implementation of scientific research. During the course, the student masters modern ideas about the main directions of development of inorganic chemistry; dependence of the reactivity of molecules on the nature of the chemical bond; positions in the Periodic Table of D.I. Mendeleev, analyzes the structure and properties of compounds.	Reproductive Method and Demonstration Method	LO4, LO5, LO6, LO7	Written examination
2	FGCh 202/1 Analytical chemistry	CC/ OC	6	The course "Analytical Chemistry" deepens the knowledge gained in the course "Inorganic Chemistry" and provides more advanced opportunities for determining the chemical composition of a substance by systemic and fractional methods of analysis. The theoretical foundations of quantitative analysis and the directions of using modern instrumental methods of analysis: spectroscopic, electrochemical, chromatographic, and physical are considered.	Research methods	LO4, LO5, LO6, LO7	Written exam
3	FGCh 202/2 Quantitative and qualitative analysis	CC/ OC		The purpose of the discipline is the formation of students' analytical skills to determine the qualitative and quantitative composition of the components in the analyzed object. In the first part of the course, the theoretical foundations of the classical methods for the separation of anions and cations are studied: sulfide, acid-base, ammonia-phosphate separation systems. The second part of the course is aimed at mastering the chemical methods of analysis, both gravimetric and titrimetric, and physicochemical methods of analysis.	Research methods	LO4, LO5, LO6, LO7	Written exam



4	FGCh 203 Organic chemistry of aliphatic compounds	CC/ UC	5	The purpose of the course of organic chemistry of aliphatic compounds is the formation of a fundamental basis for the foundations of organic chemistry: the theory of the structure and reactivity of organic compounds, knowledge of the mechanisms of organic reactions, general laws and patterns. During the course, the student acquires practical skills in performing organic chemical laboratory work in the form of: solvent distillation, extraction, thin-layer and column chromatography, determination of the melting point of compounds.	Reproductive Method and Demonstration Method	LO4, LO5, LO6, LO7	Written examination
5	FGCh 304 Organic chemistry of cyclic compounds	CC/ UC	5	The organic chemistry of cyclic compounds is aimed at continuing and deepening knowledge based on the basic organic chemistry of aliphatic compounds. Familiarity with the complex structure and properties of cyclic organic compounds: cycloalkanes, classes of condensed and non-condensed aromatic, heterocyclic compounds. The electronic mechanisms of the main types of chemical reactions, which logically follow from the electronic structure of this class of compounds, are considered.	Reproductive Method and Demonstration Method	LO4, LO5, LO6, LO7	Written examination
6	FGCh 305/1 Physical chemistry	CC/ OC	6	The purpose of the subject of physical chemistry is to form students' fundamental knowledge of thermodynamics, electrochemistry, chemical kinetics and catalysis, to teach the legality of processes and methods of their control in the indicated chapters; be able to characterize and analyze thermal processes and patterns, get acquainted with the methods of regulating the reaction rate;	Research methods	LO4, LO5, LO6, LO7	Written exam
7	FGCh 305/2 Structure of matter	CC/ OC		As a result of mastering the discipline, the student should know the main modern approaches to describing the properties of gases, liquids and solids using the methods of statistical physics and quantum mechanics; be able to use the information obtained about the	Research methods	LO4, LO5, LO6, LO7	Written exam



				electronic and magnetic properties of solids to explain the physical foundations of modern experimental methods for studying substances used in physical and chemical research.			
8	FGCh 306/1 Methods of solving tasks in chemistry	CC/ OC	6	The purpose of this course is to acquaint future teachers of chemistry with the methodology for solving computational chemical problems and to acquire practical skills in organizing the solution of problems in chemistry by students in the process of teaching chemistry in high school. The study of this discipline allows you to equip students with knowledge, practical skills and abilities in solving chemical problems, tasks of increased complexity, monitoring learning outcomes.	Explanatory and illustrative method	LO4, LO6	Written exam
9	FGCh 306/2 Olympiad problems in chemistry	CC/ OC		In the course of studying the course, develop the creative abilities of students and teach them how to use them; to teach students to solve problems in several alternative ways, to choose the most elegant solutions; formation of students' knowledge and skills to teach students to solve chemical problems. An important component of this course is the ability to solve problems and exercises in chemistry, tasks of increased complexity.	Explanatory and illustrative method	LO4, LO6	Written exam
10	CT(DP 104/1 Continuous training (introductory) practice	CC/ UC	1	Educational and familiarization practice is important for ensuring the unity of theoretical and practical training of future bachelors, the complex formation of a system of knowledge and organizational skills, which can ensure the formation of professional competencies of a future bachelor.	Practical method. Method of collection and analysis	LO8, LO10	Report

PAB -6 Biodiversity of plants and animals:

Description of the module: Biodiversity of plants and animals was formed as a branch of biological science that studies botanical and zoological patterns. It gives a complete picture of the basic laws of the spread of life. The module examines the various levels of morphological organization of the animal and plant kingdoms, as well as the composition, similarities and differences of plant and animal cells. Students also get acquainted with the biodiversity of lower and higher plants, animals and study their structure, phylogenetic relationships, interaction with the environment, their significance and conservation. Conducts biological observations of plants and animals in natural conditions. The data obtained on the



biodiversity of plants and animals make a significant contribution to the development of the systematics, evolution, and phylogeny of living organisms, which are important theoretical areas of biology.							
№	Name of subject and code	Cycle/component	Credits	Subject discription	Teaching methods	LO by EP	Assessment methods
1	PAB 101 Botany	CC/ UC	5	When mastering the course, “students describe the features of the internal and external structure of plants, study the patterns of growth and development. Can conduct analyzes on topics that will take place in laboratory classes related to cellular structure, tissues, seeds, reproduction. Applies the comparative morphological method and acquired knowledge in the course of scientific production and practical work.	Microscopic method, comparative analysis, critical thinking, case study, Stem, empirical research methods	LO5, LO7, LO9	Written examination
2	PAB 101 Zoology	CC/ UC	5	On the course, students systematize vertebrates and invertebrates. Study their evolution and phylogenetic relationships, vital activity, distribution in the environment. Characterize and compares structural features of invertebrates. Work with animals in natural and fixative liquids, laboratory equipment. Studies the diversity of animals, organizational features, lifestyle, origin and evolution, significance in nature and human life.	Methods of empirical research Criteria-based thinking, mental map	LO5, LO7, LO9	Written examination
3	PAB 203/1 Cytology, histology and embryology	CC/ OC	5	In the course of studying the discipline, students master the structure and chemical composition of cells, functions, general patterns of reproduction and cell structure. Knowledge is formed about the classification of tissues, the function and formation of germ cells, the process of development and fertilization, the main stages of embryonic development. He is proficient in methods of studying the microscopic structure of cells and tissues. Defines the organic connection of histology	Methods of cytochemistry and histochemistry, Case method	LO5, LO7, LO9	Written examination



				between the sciences of anatomy, biochemistry and physiology.			
4	PAB 203/2 Cellular pathology	CC/ OC		In this discipline, students consider typical pathological processes characterized by a violation of intracellular homeostasis. Studies what limits the functionality of the cell and leads to its death or a decrease in life expectancy. She supplemented her knowledge of pathological disorders of cells in tissues and the body, histopathology and phytopathological molecular methods, the initial levels of malignant neoplasms.	Microscopy, methods of cytochemistry and histochemistry	LO5, LO7, LO9	Written examination
5	PAB 204/1 Ecophysiology	CC/ OC	5	On the course, the student studies the biochemical foundations, the variability of plants on physiological and environmental factors. Analyzes the interaction of plant activity in the environment with physiological processes, temperatures, global changes under abiotic stress. Students acquire new competencies in studying whether living organisms interact with factors of the physical environment or biophysical, biochemical and physiological processes used in ecological communication with other organisms.	Methods of empirical research, Critical thinking	LO5, LO7, LO9	Written examination
6	PAB 204/2 Teaching about the environment	CC/ OC		In the course of studying the discipline, students study the ecological situation of the environment, the components and evolution of the biosphere, the patterns of development of processes. Examine the concept of a living being and the concepts of life support and sustainable development. Form scientific thinking and outlook and a scientific approach to the biosphere, the genesis of human settlements, the structure of the fauna and flora of urban areas, the methodology of environmental monitoring.	Methods of empirical research, Critical thinking	LO5, LO7, LO9	Written examination
7	PAB 405/1 Evolutionary studies	MC/ OC	5	The course is aimed at studying: the history of the formation of modern evolutionary theory and its main provisions; features of the processes of micro- and macroevolution; speciation concepts; the genetic structure of populations; causes of modification and mutational variability;	Case study method, business game "Brainstorm", mental map	LO5, LO7, LO9	Written examination



				consequences of the influence of abiotic, biotic and anthropogenic factors on the heredity and variability of living organisms. In addition, exhibits environmental literacy and uses basic knowledge of biology in life situations;			
8	PAB 405/2 Anthropology	MC/ OC		This course studies the origin and evolution of man and human races, the physical structure of man, the morphological and physiological characteristics of ethnic and other communities of people. Students study the formation of human culture and civilizations, the structure of human society in different historical periods and in different territories.	Case study method, business game "Brainstorm", mental map	LO5, LO7, LO9	Written examination
9	CT(IP 104/2 Training-field practice	CC/ UC	1	During field practice, students learn to identify plants in field and laboratory conditions, conduct biomorphological descriptions of plants (anatomical and morphological analysis), conduct phenological observations in nature. Creates herbarium samples from plant species and gets acquainted with international names of species. Defines the plant communities of the environment. Gets acquainted with the types of medicinal, raw materials, production, feed value. As a result of practice, students develop their own research skills.	Methods of empirical research (observation, comparison, measurement, experiment	LO5, LO9	Report
<p>SHDLO -7 Structure, heredity and development of living organisms: <i>Description of the module:</i> When studying this module, students study the macromolecules of the cell – proteins, nucleic acids and their processes. Also, they get acquainted with the material foundations of heredity, the peculiarities of the structure of the nucleus, chromosomes, DNA. Compares genomic structures of prokaryotes and eukaryotes.</p>							
№	Name of subject and code	Cycle/component	Credits	Subject description	Teaching methods	LO by EP	Assessment methods
1	SHDLO-301/1 Human anatomy	CC/ OC	5	When mastering the course "Human Anatomy", students study the shape and structure, origin and development of the human body. Anatomy provides a systematic description of the shape, structure, position and topographic relationships of parts and organs of the	Empirical research methods (observations, comparisons,	LO5, LO7, LO9	Written examination



				body, taking into account age, gender and individual characteristics.	measurements) ICT technology Modeling		
2	SHDLO-301/2 Biology of ontogenesis	CC/ OC		When mastering the course, students study the patterns of ontogenetic development of organisms. The course gives an idea of the macro- and micro-morphological, physiological-biochemical, molecular and genetic processes occurring in developing organisms, as well as the factors and mechanisms that control development processes at all stages of the ontogenesis of animal and plant organisms.	Empirical research methods (observations, comparisons, measurements) ICT technology Modeling	LO5, LO7, LO9	Written examination
3	SHDLO-302 Genetics	CC/ UC	6	Students study heredity, Mendel's laws and reveal the meaning. He is able to solve problems for Mono- and dihybrid hybridization. Get acquainted with modern methods and directions of growing plants and animals. Knows genetic methods, methods of human heredity research, genetic terminology. Uses in practice the methods of compiling scientific and technical reports, reviews, analytical maps and explanatory notes, possesses narrative and critical thinking, compares the results of field and laboratory studies.	Laboratory-analytical method case method, team work	LO5, LO7, LO9	Written examination
5	SHDLO-303/1 Biochemistry	MC/ OC	6	When mastering the course of biochemistry, students study the chemical composition of living organisms and the chemical processes occurring in them. They study the structure and properties of the most important biological compounds - proteins, nucleic acids, carbohydrates, lipids; their chemical transformations in the body and the significance of these transformations for understanding the physical and chemical foundations of the vital activity of all life on Earth.	Methods of empirical research (observation, comparison, measurement, experiment	LO5, LO7, LO9	Written examination
6	SHDLO-303/2 Basics of Enzymology	MC/ OC		In the Basics of Enzymology course, students learn about enzymes. They study the principles of operation of protein molecules that catalyze or inhibit biochemical reactions that underlie all biological processes and are	Methods of empirical research (observation, comparison,	LO5, LO7, LO9	Written examination



				used in various industries, agriculture and medicine. Use modern methods of processing, analysis and synthesis of field and laboratory biological information, demonstrate knowledge of the principles of compiling scientific and technical projects and reports.	measurement, experiment		
7	SHDLO-404/1 Molecular biology	MC/ OC	5	In the course, students study the structure and functions of complex high-molecular compounds that make up the cell, the mechanisms of preservation and expression of genetic information. Know the structure and functional features of protein, DNA, RNA. Understand the principles of cellular organization of biological objects, biophysical and biochemical foundations, membrane processes and molecular mechanisms of life.	Analytical-synthetic method, sequencing	LO5, LO7, LO9	Written examination
8	SHDLO-404/2 Biology of nucleic acids	MC/ OC		In the course "Nucleic Acid Biology" students study the structure and functions of nucleic acids, the principles and mechanisms for the implementation of hereditary information, the molecular basis of the structure and functions of cells, the growth, development, division, and changes in tumors. Use basic knowledge in the field of natural sciences in cognitive and professional activities, apply the methods of mathematical analysis and modeling, theoretical and experimental research.	Analytical-synthetic method, sequencing	LO5, LO7, LO9	Written examination

TME-8 Theory and Methodology of Education

Description of the module: The module "Theory and methodology of teaching" discusses current aspects of the theory, methodology and practice of chemical and biological education. Special attention is paid to the didactic, methodological and technological foundations of teaching chemistry in the context of modern requirements of the State General education. The module is aimed at the formation of functional competencies, the development of abilities to perform tasks in the professional and educational spheres. In order to form professional competence and prepare students for pedagogical activity, pedagogical practices are conducted. In the process of pedagogical practice, the professional and personal development of future teachers is activated. Students will learn how to draw up and implement an educational activity plan with a group of students, develop and conduct a system of classes reflecting the completed segment of the learning process based on the content of core disciplines, demonstrate mastery of modern technologies and teaching methods.

№	Name of subject and code	Cycle/component	Credits	Subject description	Teaching methods	LO by EP	Assessment methods
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1	TME-301 Methods of teaching chemistry	MC/ UC	5	The course "Methods of teaching chemistry" gives an idea of the main achievements of Russian pedagogy, pedagogical psychology and didactics in their application to the issues of teaching chemistry in secondary educational institutions. The course introduces students to the educational tasks and content of the school chemistry course, methodology and basic principles of teaching chemistry, methods of teaching chemistry, organization of extracurricular work in chemistry.	Case study method, project	LO8, LO10	Report
3	TME -302 Methods of teaching biology	MC/ UC	5	During the course, students study the structure and content of the basic course of biology in a secondary school, the modern goals and objectives of teaching biology in a secondary school in the context of the implementation of the State Educational Standard of the updated content of education; develops skills in working with databases, spreadsheets, IT technologies, Smart and cloud technologies. Form effective knowledge with new technologies based on an updated educational program.	Critical thinking, binary method, pedagogical teaching methods	LO8, LO10	Report
4	PP 303 Pedagogical Practice	CC/ UC	6	In the course of pedagogical practice, students-trainees form a holistic view of professional pedagogical activity aimed at transferring socio-cultural experience through training and education, creating conditions for the personal development of trainees; theoretical knowledge, practical skills and skills.	A practical method. Case study method (analysis of certain situations)	LO8, LO10	Report
5	P(P)P 404 Production (pedagogical) practice	MC/ UC	16	The purpose of the production (pedagogical) practice is to consolidate and expand the theoretical knowledge gained in the study of special disciplines through the organization of the students' learning process and the development of teaching materials; to gain experience, practical skills, teaching skills in the field of lectures and seminars.	A practical method. Methods of empirical research (observation, comparison, measurement, experiment)	LO8, LO10	Report



6	P(P)P 405 Pre -diploma (pedagogical) practice	MC/ UC	2	Pre-graduate practice is the preparatory stage of the thesis, during which the student must collect the initial data for his research during the implementation of the diploma project. During the implementation of the pre-graduate practice, the student summarizes the results of research and analytical work in the form of a diploma design, an article, a report.	Research methods	LO8, LO10	Report
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FSR -9 Fundamentals of synthesis and research

Description of the module: The module "Fundamentals of Synthesis and Research" gives students the opportunity to apply their theoretical knowledge of the basics of organic, inorganic, analytical chemistry to master modern physical research methods, chemical technologies and synthesis of inorganic and organic substances.

№	Name of subject and code	Cycle/comp onent	Credits	Subject discription	Teaching methods	LO by EP	Assessment methods
1	FSR-401/1 Physicochemical research methods	MC/OC	4	The discipline is aimed at mastering the theoretical foundations of physical research methods, acquaintance with modern advanced instrumental methods of analysis, experimental techniques, methods of solving chemical problems. The course "Physico-chemical research methods" forms knowledge and skills that allow using the possibilities of physico-chemical methods in chemical research to establish and identify the structure of a substance.	Research methods	LO4, LO5, LO6, LO7	Written examination
2	FSR-401/2 Modern methods of analysis	MC/OC		The course "Modern methods of analysis" examines the latest methods of analysis of compounds: methods of mass spectroscopy, IR, NMR ¹ H and ¹³ C, UV spectroscopy, X-ray structural analysis. It is aimed at mastering the basics and principles of analyzing the empirical results obtained and processing the analysis data, forms the skills of conducting preliminary calculations, comparing the results of the experiment with preliminary calculations.	Explanatory illustrative method	LO4, LO5, LO6, LO7	Written examination



7	FSR-402/1 Chemical technology	MC/OC	5	The course "Chemical Technology" is aimed at studying standard methods for the production of inorganic and organic substances in chemical technology, the scope of their application, classification of technological processes, identification and investigation of the properties of the compounds obtained, rules for processing and registration of experimental results, TB standards. The course forms the skills of conducting an experiment according to the developed methods and processing the results.	Research methods	LO4, LO5, LO6, LO7	Written examination
8	FSR-402/2 Chemical technology of inorganic substances	MC/OC		The purpose of teaching the discipline is to study the most important typical productions of the main chemical industry of inorganic substances. The study of physico-chemical properties, synthesis and kinetics of the main products, the types of raw materials used, industrial methods of production of inorganic substances. Using the example of existing production facilities, the possibilities of rational complex processing of raw materials, optimal technological solutions are studied and technical and economic indicators are compared taking into account scientific achievements in industry.	Research methods	LO4, LO5, LO6, LO7	Written examination
9	FSR-403/1 Chemical synthesis	MC/ OC	5	The course of the discipline "Chemical synthesis" is aimed at developing the ability to develop strategies and tactics for the synthesis of chemicals. The course provides the theoretical foundations of modern ideas about the structure and properties of substances, fundamental approaches to the design and synthesis of new chemical compounds, the choice of the method and conditions of synthesis, kinetic and thermodynamic control of chemical reactions, techniques for preparing and implementing synthesis, purification and analysis of synthesized substances.	Research methods	LO4, LO5, LO6, LO7	Written examination



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10	FSR-403/2 Methods for the synthesis of new chemicals	MC/ OC		<p>The course promotes the application of the student's knowledge of the basics of chemical thermodynamics and kinetics in inorganic synthesis, basic methods of raw material preparation and purification, effective methods for obtaining simple and complex substances from the elements of the periodic system in laboratory and production conditions.</p> <p>The course develops the ability to analyze standard methods of obtaining and develop new synthesis methods, process experimental results.</p>	Research methods	LO4, LO5, LO6, LO7	Written examination
1	WDDP(P)PCE 401 Writing and defending a diploma paper (project) or passing a comprehensive exam	FA	8	<p>The defense of the thesis (project) includes the writing of the thesis (project) and the defense procedure. At the same time, the thesis (project) is aimed at identifying and evaluating the analytical and research abilities of the graduate.</p> <p>The answers to the exam tasks are evaluated in accordance with the approved program of the comprehensive exam. When determining the assessment, the literacy of the submitted written answers, the style of presentation and the overall design are taken into account.</p>	Research methods	LO4 - LO10	Defense/ State exam



3. RESOURCE SUPPLY OF THE EDUCATIONAL PROGRAM

3.1. Library fund

One of the important indicators of the quality of training in the educational program is the provision of students with educational, methodological, scientific literature, reference and periodicals.

The library Fund for the EP cipher and name as of may 1, 2022 is 11562 copies, including in the state language – 7729 copies, 3584 copies in Russian and 249 copies in foreign languages.

The University library provides students and faculty with access to databases: IPR books, Polpred, Alembook, Web of Science, Elsevier (Scopus).

Access to the Republican interuniversity electronic library (RIEL), which combines electronic educational and scientific resources of Universities of the Republic of Kazakhstan, is provided.

Students of the educational program have access to the following scientific journals: Students of the educational program are provided with access to the following scientific journals: Izvestiya NAN RK, Bulletin of NAN RK, Chemical journal of Kazakhstan, Bulletin of KazNU named after al-Farabi (chemical series, biological series), Vestnik KazNatsZhenPU, Chemistry mecepta, Biology at the Kazakhstan school, Chemistry at school (Russia), Biology at school (Russia), Chemistry directory, Biology directory, Search, Higher School of Kazakhstan.

Since 2010, the library provides an opportunity for students of Kazakh National Women's Teacher Training University to get acquainted with the content of master's theses in traditional format (more than 150 titles), half of it have been converted into PDF format.

Students can also use the "Kazakh National Women's Teacher Training University's Electronic library" service, which provides access to the electronic library from a computer anywhere in the world in 24/7 format (website address: lib.kazmkpu.kz). There are about 10,000 full-text sources, more than 1,000 licensed books, 6676 scanned books by the library staff, and about 300 books that belong to the rare collection.

3.2. Staffing

The educational program is implemented by the Chairs Chemistry. Quantitative and qualitative indicators of faculty serving the educational program (disciplines of basic and major cycles):

Total number of faculty - 51 people, including:

Doctor of science – 4

Candidate of Sciences – 12

Ph.D – 11

Masters' degree – 23

Master teacher - 1

The ratio of degree awarded faculty members of the EP – 52,94 %.

The educational program is implemented by the Chairs Biology. Quantitative and qualitative indicators of faculty serving the educational program (disciplines of basic and major cycles):

Total number of faculty - 37 people, including:

Doctor of science – 0

Candidate of Sciences – 17

Ph.D – 5

Masters' – 15

The ratio of degree awarded faculty members of the EP – 59,5 %.

Qualification characteristics of the faculty members within the educational program are reflected in the Human Resources Manual.



The qualification characteristics of the teaching staff of the educational program are reflected in the **Personnel Directory**.

3.3. Material and technical base

Department of chemistry

Laboratory research, classes, experiments, analyses, experiments for scientific and industrial purposes are conducted in a specially designated room – the laboratory. All laboratory classrooms are equipped and equipped with special chemical modern equipment (photo colorimeter, thermostat, ionometer, potentiometer, electronic, analytical scales). All laboratory classrooms of the Department of chemistry meet the requirements of curricula and programs to conduct laboratory and research work.

Laboratory name: "Integrated Chemical and Biological Research Center".

Laboratory equipment: Distiller "GFL-2004", IR - spectrometer "Bruker ALFA", UK - spectrometer "SI Analytix UviLine 9400-9100", Atomic - adsorption spectrometer "Perkin Elmer Pin AAcle 900", X-ray diffractometer "RiGaku Mini Flex 300/600", Analytical scales "Ohaus Pioneer", pH-meters.

Chemical equipment in the laboratory: computer, interactive whiteboard (acer), reagents and devices for laboratory training, fume cupboard, electronic scales, microscope, adsorption unit. (computer capacity). QALFC., laboratory electric furnace, conductometer, muffle furnace, water thermostat, rotary evaporator, technical scales, water heater flask, reactor glass for organic synthesis, drying cabinet, photocolimetr, drying cabinet, melting point. Detector, refractometer, photocolimeter KFC 2, pH-meter.

Department of Biology

Also all laboratory classes, tests, analyses, experiments for scientific and production purposes are conducted in a specially designated room - the laboratory. All laboratory rooms are equipped with special modern equipment (binocular microscope, spectrophotometer, thermostat, centrifuge, laminar box, autoclave, sterilizer, shaker, PCR, pH-meter, distiller, electronic and analytical scales). All laboratory classrooms of the Department of Biology meet the requirements of curricula and programs to conduct laboratory and research work.

The equipment in laboratory: Autoclaves desktop CERTOCLAV Multicontrol, binocular microscope, microcentrifuge Espresso, laminar box (1 class biologich. protection), spectrophotometer Jenway, microscope Altami 104 monocular, pH-meter laboratory, videomicroscope laboratory MS-100 LCD PC, MZP-01 TECHNOM (with electric drive), Distiller with a reservoir (for single water distillation), incubator with orbital shaker model SI500/ SI505, orbital shaker (KS 130 basic set), BIOTEST thermostat for BOD determination, sterilizer CSL-UVCAMBINI, Vortex lab dancer, analytical scales LV 210-A, water bath GFL 1023, laboratory scales (electronic).

Practice bases:

№	Name of company	№ and contract date
1	KGA " No. 59 school-gymnasium ", Almaty	№ 298 of 13.10.2023 y.
2	KGA " No.169 school-gymnasium ", Almaty	№52 of 03.10.2023 y.
3	KGA " No. 15 Linguistic gymnasium ", Almaty	№200 of 10.10.2023 y.
4	KGA " School-gymnasium No. 138 named after M. Bazarbaev, Almaty	№55 of 03.10.2023 y.
5	KGA «School-lyceum No.143 named after.Suyunbaya», Almaty	№1 of 26.09.2023 y.



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6	«No.119 school- lyceum», Almaty	№400 of 23.10.2023 y.
7	KGA «Общеобразовательная школа №26», Almaty	№572 of 05.01.2024 y.
8	KGA «No. 132 gymnasium», Almaty	№406 of 23.10.2023 y.
9	KGA «Secondary school No. 204», Almaty	№401 of 23.10.2023 y.
10	KGA «Gymnasium No. 130 named after. I. Dzhansugurova» Almaty	№996 of 14.12.2022 y.