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Higher and Postgraduate Educational Programs

☐ Project EP ☒ Participant of project EP

OHPE (Developer)

non-profit joint-stock company "Abai Kazakh National Pedagogical University"

Title of project EP

Co-developers

NJC «KazNWTTU»

Date of registration in the Registry

06.06.2024

Registration number

6B01500454

Date of EP passport updating

14.07.2026 21:49

Field of education

6B01 Pedagogical sciences

Direction of personnel training

6B015 Training of teachers in Natural science subjects

Group of educational programs

B009 Teacher training in mathematics

Educational program

6B01511 Mathematics (IP)

EP purpose

Training of future teachers who want to specialize as a mathematics teacher (in schools, colleges, universities), in able to quickly navigate the ever-changing conditions in the field of education and meeting the requirements for a

EP type

Innovative EP

Level on NQF

6

Level on SQF

6

EP distinctive features

No

Language of education

Russian Kazakh multilingual

Professional Standard for EP

Exists

№	Name of professional standard
1	Professional standards for teachers of educational organizations



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developing EP

Professional standard №1

Professional standard

Профессиональные стандарты для педагогов

Approval year

2024

CCEA

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Professions

Profession №1

Profession

Учителя средней школы

Уровень по ОРК

6

Labor functions

- Осуществление классного руководства
- Оценивание учебных достижений обучающихся
- Осуществление учебно-методической деятельности
- Приобщение обучающихся к систематическому обучению
- Осуществление учебного процесса.

Profession №2

Profession

Педагогии колледжей и других организаций

Уровень по ОРК

6

Labor functions

- Осуществление учебного процесса с учетом индивидуальных способностей и потребностей обучающихся
- Проведение мониторинга образовательных достижений обучающихся.
- Осуществление научно-методической деятельности.
- Осуществление деятельности руководителя учебной группы.

Volume of the credits

240

Degree to be conferred

Bachelor

Period of study

4

Date of approval EP on the Academic Council

27.04.2026

Date when EP was approved by the Republican Educational and Methodological Board of the Ministry of Science and Higher Education of the Republic of Kazakhstan

17.05.2023

☒Existence of the annex to the license for the direction of personnel training

The license number on the direction of training

KZ49LAM00007465

☐The training format is online

☒EP accreditation existence

Atlas of new professions

қарастырылмаған



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The formed educational outcomes

№	Educational outcome	Code	Reflects the labor function
1	Possess intercultural	ON1	Приобщение обучающихся к системе ценностей. Осуществление учебного процесса с учетом индивидуальных способностей и потребностей обучающихся.
2	To collect and	ON2	Осуществление научно-методической деятельности. Осуществление учебного процесса с учетом индивидуальных способностей и потребностей обучающихся.
3	Critically select	ON3	Осуществление учебно-методической деятельности. Осуществление деятельности руководителя учебной группы.
4	To understand	ON4	Осуществление учебного процесса с учетом индивидуальных способностей и потребностей обучающихся. Осуществление деятельности руководителя учебной группы.
5	To recognize	ON5	Осуществление учебного процесса. Осуществление учебного процесса с учетом индивидуальных способностей и потребностей обучающихся. Проведение мониторинга образовательных достижений обучающихся. Оценивание учебных достижений обучающихся.
6	To comprehend	ON6	Осуществление научно-методической деятельности. Приобщение обучающихся к системе ценностей.
7	To generalize	ON7	Осуществление научно-методической деятельности. Осуществление учебного процесса с учетом индивидуальных способностей и потребностей обучающихся.
8	To understand	ON8	Осуществление учебно-методической деятельности. Осуществление учебного процесса с учетом индивидуальных способностей и потребностей обучающихся. Осуществление научно-методической деятельности.
9	Apply IT to expand	ON9	Осуществление научно-методической деятельности. Осуществление учебного процесса с учетом индивидуальных способностей и потребностей обучающихся. Осуществление учебно-методической деятельности.
10	To apply theoretical	ON1	Осуществление учебного процесса с учетом индивидуальных способностей и потребностей обучающихся. Осуществление учебно-методической деятельности.
11	To use modern	ON1	Осуществление научно-методической деятельности. Осуществление учебно-методической деятельности.
12	To systematize	ON1	Осуществление учебно-методической деятельности. Осуществление научно-методической деятельности. Осуществление учебного процесса с учетом индивидуальных способностей и потребностей обучающихся.

Data on disciplines

№	Name of discipline	Short description of discipline	Cycle
1	Fundamentals of Scientific Research	The goal is to form knowledge about the principles, technologies, practical methods and techniques of conducting scientific research based on modern achievements of scientists. Forms the basic foundations of scientific culture and ethics, flexible perception of scientific texts, skills of effective application of acquired knowledge in planning and organizing research work, the ability to analyze and summarize research results.	GED

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		 ЕДИНАЯ ПЛАТФОРМА ВЫСШЕГО ОБРАЗОВАНИЯ	English 	
2	Ilyastanu	high aesthetic taste, appreciating literature, art, traditions, culture and language of the Kazakh people through a deep and comprehensive study of the works of Ilyas Zhansugurov. Forms an understanding of the importance of the works of Ilyas Zhansugurov in the development of the Kazakh literary language; skills of intellectual and creative thinking, the ability to cherish the values of national and spiritual heritage.	GED	
3	Fundamentals of Financial Literacy	The course is aimed at gaining knowledge and skills in the field of personal finance management. Also, as part of the course, students will learn how to use in practice all kinds of tools in the field of finance, save and increase savings, plan a budget competently, learn how to analyze financial information and navigate financial products to choose an adequate investment strategy.	GED	
4	Basics of Law and Anti-corruption Culture	The objective is to familiarize students with the fundamental branches and institutions of law, the foundations of anti-corruption culture, as well as the patterns of emergence, development, and functioning of the state and law. The course cultivates anti-corruption awareness and a high level of theoretical knowledge concerning the primary functions of law within the state and society, its impact on the development of the rule of law and civil society, and the value of inclusion as an integral component of a just and equitable legal order. Particular emphasis is placed on fostering students' understanding of the importance of human rights for all individuals, regardless of their social, cultural, physical, or other characteristics.	GED	
5	Ecology and Life Safety Basics	Purpose – the goal is to develop knowledge of the fundamentals of ecology, sustainable development, and life safety, enabling the analysis of ecological processes, the assessment of the socio-environmental consequences of anthropogenic activities, the assurance of environmental safety, and the application of methods and technologies for protection in emergency situations. Develops the ability to assess the impact of environmental factors on human health; to forecast ecological processes for planning and implementing measures aimed at enhancing life safety and ensuring environmental security; and to make informed decisions in adverse environmental and emergency situations, taking into account the potential consequences of accidents, disasters, and natural hazards within the framework of sustainable development principles.	GED	
6	Economics and Entrepreneurship	Objective – to familiarize students with the economic challenges of modern society, develop economic thinking, and provide knowledge of the theoretical foundations and practical skills in the field of entrepreneurship. The program is aimed at forming a comprehensive understanding of the functioning of the economy, while delivering business education focused on acquiring applied competencies in various areas of entrepreneurial activity. Special attention is given to issues of sustainable development, efficient resource use, and the implementation of lean production principles as key elements of effective and environmentally responsible business practices. The course also explores the specifics of creating and successfully managing a business, taking into account modern requirements for environmental and social responsibility in entrepreneurship.	GED	
7	Algebra and Numbers Theory	During the course, pre-service teachers build their understanding of the fundamental concepts and methods of higher algebra and number theory. They also develop their abstract and analytical thinking, as well as a general mathematical culture. Pre-service teachers develop their skills in using abstract mathematical apparatus necessary for analyzing and modeling processes and phenomena. They also learn to master methods of processing and analyzing results using algebra and number theory.	BD	
8	Analytical Geometry	The discipline is aimed at studying the concepts and methods of analytical geometry and elements of vector algebra. The main content of the discipline is the study of lines and surfaces of the 2nd order, the study of their equations, linear and affine transformations of the plane. Attention is paid to the use of analytical geometry methods to solve problems of school geometry.	BD	

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9	Assessment and Development	and the ability to provide constructive assessment in an ethical manner at various stages of the learning process and critically evaluate and analyze their understanding and practice regarding assessment Students can:be well versed in a variety of assessment and feedback methods (for example, formative and final assessment) apply pedagogical principles to determine and recognize the levels of educational competence of students	BD		
10	Age and Physiological Features of the Development of Children	The purpose of this course is the formation of competence in the field of pedagogy and didactics. Pre-service teachers are familiar with the formation of psyche, its functioning, and the patterns of development. Pre-service teachers can observe the development of their students, and accordingly, plan and implement age-appropriate learning processes considering individual needs of students. Pre-service teachers act creatively and appropriately in different situations and support learning and well-being of the learners. Pre-service teachers who demonstrate competence can: recognize the individual starting points of different students, their learning potential and specific support needs; consider the individual needs of their students for specific support, guidance, teaching and assessment; introduce various methodological solutions for inclusion and for providing specific support.	BD		
11	Education Science and Key Theories of Learning	The purpose of this course is to improve pedagogical competence 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 theories of learning and pedagogical models. Based on the understanding of theoretical concepts, future teachers can make appropriate pedagogical choices for various educational situations.	BD		
12	Psychology in Education and Concepts of Interaction and Communication	The purpose of this course is the formation of competence in the field of pedagogy and didactics; the area of competence for interaction. Pre-service teachers are familiar with the modern psychological theories and models, as well as personality functioning and individual properties. They can apply the knowledge in their teaching in diverse educational contexts. Pre-service teachers support positive development of learners by fostering dialogue, interaction, and communication in the educational process. They are able to communicate, interact, and collaborate with pupils' families as well as in various other partnership networks and create new relationships suitable for the development of their own pedagogical activity. Pre-service teachers who demonstrate competence can:understand the basic concepts and terms of educational psychology, and the main practical applications of psychological knowledge;understand the patterns, facts, and phenomena of cognitive and personal development of a person in the processes of education and upbringing; apply an integrated approach to design, implementation, evaluation, and development of educational environments; understand the concept of continuous learning as a part of the process of cognitive and personal development of a person. Apply basic communication and interaction concepts and theories at the individual, community, and network levels;select the methods of communication and interaction that are most appropriate to facilitate learning in various forms (offline, online, blended, hybrid);recognize the patterns of group dynamics and act in ways that promote community development and well-being.	BD		
13	Differential Equations	The course focuses on developing pre-service teachers' understanding of the basic mathematical apparatus for studying the processes and phenomena of the world around by using concrete examples from applied fields of knowledge. Pre-service teachers develop their skills in identifying factors that significantly affect a process or phenomenon in creating its dynamic model, described by ordinary differential equations. They also build their understanding of the relationship between the laws of science applied with the nature of the problem being studied and mathematics connected to it.	BD		
14	Fundamentals of Artificial Intelligence	The discipline is aimed at studying the basic concepts, methods and algorithms underlying the creation and application of artificial intelligence. In this course, students will study the theoretical foundations of machine learning, neural networks, natural language processing algorithms and computer vision. They will also get acquainted with the ethical, social and legal aspects of the application of artificial intelligence in various spheres of life.	BD		



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15	Research, Development and Innovation	their work, pre-service teachers acquire new research-based knowledge and conduct practice-based research in an ethical manner in various networks concerning the development of education and teacher profession, innovative approaches to learning, as well as learning and guidance of students. Pre-service teachers adopt development-oriented mindset and are able to develop, update and apply innovative teaching approaches and technologies in the context of ongoing changes in society and the educational environment	BD
16	Inclusive Educational Environment	Goal: understanding and the ability to take into account the diversity of students in the learning/teaching process, in a reasonable way, psychologically and ethically maintain well-being, taking into account the context of their lives. Students can:Embrace diversity, identify barriers to participation and learning identify development priorities, plan activities for the adaptation of educational programs, the development of differentiated lessons promote collaboration in the school community to create a foundation of inclusive values and support student participation and academic achievement.	BD
17	Differential and Integral Calculus of Functions of Many Variables	The course focuses on the study of limits, continuity, derivatives, and integrals of multivariable functions. It covers concepts such as gradients, extrema, multiple and line integrals, and demonstrates their applications in solving theoretical and practical problems.	BD
18	Mathematics Teaching Methods	During the course, pre-service teachers improve their assimilation of mathematics content, methods, techniques of teaching sections of secondary school mathematics. They develop their skills in using constructive learning theory with behavioral and cognitive approaches. They also explore methodological development for conducting mathematics lessons at school and organizing learning activities of students.	BD
19	Teaching Methods and Technologies	Pre-service teachers have a comprehensive understanding of teaching strategies and methodologies, and can apply them in planning, teaching, and assessment in innovative ways matching the specific pedagogical situations, conditions of a specific school and the capabilities of students. Pre-service teachers are able to design suitable inclusive physical and online learning environments at different stages of the educational process. Pre-service teachers understand and can apply the regulations of copyright and data protection in their learning material planning. Pre-service teachers possess necessary knowledge of didactics, learning technologies and methods of motivating students being able to provide necessary pedagogical assistance to students	BD
20	Teaching Planning and Individualization of Learning	Pre-service teachers are familiar with the curriculum in their area of teaching and the guiding pedagogical principles and cross-cutting development themes of a specific level of education, such as entrepreneurship and sustainable development. Pre-service teachers possess the necessary skills of individualization of teaching, considering the diversity of students and their inclusion to the learning process, as well as the use of teaching technologies, based on pedagogical and independent research.	BD
21	Pedagogical Research	Purpose: mastering the skills of searching, critical selection of knowledge from various sources, using research results in the development of one's pedagogical thinking and practice Students can:be aware of the nature of pedagogy and its basic terminology, recognize the central areas of research in pedagogy and understand the difference between everyday thinking and scientific knowledge, distinguish between cultural ideas about human nature and their significance for the work of a teacher. Adopt changes in the field of education, taking into account the prospects for their development.	BD
22	Elementary Mathematics	The discipline is aimed at studying elements of set theory, real and complex numbers, polynomials of one and several variables, algebraic expressions, algebraic equations and inequalities. Trigonometric, exponential and logarithmic formulas, equations and inequalities are considered. Attention is paid to planimetric and stereometric topics. Various methods of solving problems of the school mathematics course are studied.	BD

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ЕДИНАЯ ПЛАТФОРМА ВЫСШЕГО ОБРАЗОВАНИЯ English			
23	Workshop on Solving Algebraic Problems	secondary school algebra course and an analysis of its sections in the context of its relationship with other subjects. Formation of students' skills in learning how to solve algebra problems using standard and non-standard methods, using the transformation of algebraic and transcendental expressions; the ability to develop algebraic problems for different levels of secondary school.	BD
24	Methodological Foundations of Solving Algebraic Problems	The course focuses on the methodology of teaching algebraic problem-solving and effective solution strategies. The course covers methods for teaching equations, inequalities, functions, and word problems, as well as approaches to developing students' mathematical reasoning and problem-solving skills.	BD
25	Digital Technologies in Education	During the course, pre-service teachers develop their professional competence as a teacher through the formation of a holistic view of the role of digital technology in the modern educational environment. They develop their abilities to organize pedagogical activities on the basis of the possibilities of digital technology	BD
26	Foundations of Geometry	During the course, pre-service teachers build their understanding of the axiomatic theory of mathematical science, and axiomatic theory of geometry construction. They also develop their skills in using methods of axiomatic justification of Euclidean geometry. Pre-service teachers form a general geometric and worldview culture as a basis for mastering the language of modern mathematics.	BD
27	Workshop on Solving Geometric Problems	The course is aimed at preparing future teachers to form students' ideas about geometric methods and the possibilities of their application, as well as the importance of studying geometry for future professional activities and the application of their knowledge in everyday life. Future teachers learn to consolidate and deepen students' knowledge and skills in solving geometric problems of the school course. During the course, students learn to form students' logical thinking and their ability to use mathematical symbols in proofs and in solving various geometric problems.	BD
28	Methodological Foundations of Solving Geometric Problems	The course focuses on the methodology of teaching geometric problem-solving and effective solution strategies. The course covers methods for solving plane and solid geometry problems, techniques of geometric proof, the use of diagrams, and approaches to developing students' spatial reasoning and geometric thinking.	BD
29	Plane and Spatial Geometric Constructions	During the course, pre-service teachers study the theory of constructions on the plane and in space and learn to master the methods of solving geometric problems in construction. They also learn to master the technique of geometric constructions and develop their constructive and logical thinking, as well as their skills as a researcher.	BD
30	Fundamentals of Applied Behavior Analysis	Course goal – to develop the ability, grounded in Applied Behavior Analysis (ABA), to critically analyze data-based functions of behavior; design and implement individualized interventions in inclusive educational settings; and evaluate their effectiveness, safety, and ethical soundness. Develops skills to: operationalize behavior; collect and analyze data (incl. ABC); identify behavioral functions; design and apply behavior support plans; teach functionally equivalent alternative behavior; manage crisis situations; and assess outcomes.	BD
31	Phenomena Based Mathematical Disciplines Teaching	The course is aimed at studying the role of interdisciplinary integration in school as a means of developing students' intellectual and creative abilities.	BD
32	Design of Learning Resources in Mathematics	During the course, pre-service teachers investigate the concepts and types of digital educational resources, didactic, and the principles of developing multimedia digital content, as well as the analysis of existing digital educational resources in mathematics for secondary schools in the Republic of Kazakhstan. Pre-service teachers develop their skills in working with digital tools and developing digital educational resources in mathematics for secondary schools	BD

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English 



33	Mathematically Based Teaching Method	algorithms of teaching students to solve mathematical problems. They develop their methodological skills and their abilities to competently explain algorithms step by step for solving mathematical problems. Pre-service teachers also develop their abilities to form students' understanding of the importance of their skills in solving mathematical problems for their further life.	BD
34	Mathematically Based Non-Conventional Methods	During the course, pre-service teachers learn to raise students' interest and positive attitudes toward mathematics by using methods and techniques to support the learner.	BD
35	Mathematical Model Basis	During the course, pre-service teachers focus on studying up-to-date mathematical models to assess social and economic problems and processes, as well as scientific forecasting of the behavior of various objects through which pre-service teachers develop their functional literacy. Pre-service teachers master theoretical and practical skills of the mathematical modeling, as well as the skills of independent learning of the mathematical modeling literature and the practical use of the information provided to solve applied tasks.	BD
36	The Use of Artificial Intelligence in Teaching Mathematics	The course focuses on the theoretical and practical aspects of using artificial intelligence technologies in teaching and learning mathematics. It covers adaptive learning systems, educational chatbots, data analytics tools, and generative AI technologies to enhance the effectiveness and personalization of mathematics education.	BD
37	Applied Packages in Mathematics Learning	During the course, pre-service teachers investigate the basics of dynamic geometry and computer algebra systems as well as explore the possibilities of learning mathematics using them.	BD
38	Olympiad Problems Methods Solving	During the course, pre-service teachers develop their skills in applying basic concepts, ideas, and methods of fundamental mathematical disciplines to solve Olympiad problems, and to determine by the type of a problem the probable methods of its solution.	BD
39	Econometrics	During the course, pre-service teachers build their understanding of economic processes by using modeling and quantitative analysis, and finding quantitative confirmation or refutation of the formulated hypothesis.	BD
40	Integrated Training of Students for Professional Certification	The course is aimed at developing professional competencies and preparing students for international and industry-recognized certification exams. It covers certification requirements, exam preparation strategies, and practical problem-solving skills necessary for successful certification.	PD
41	Single Variable Differential Calculus of Functions	The course is aimed at forming a holistic understanding of the course of mathematical analysis, at understanding the relationship of mathematical concepts and their practical significance.	PD
42	Single Variable Integral Calculus of Functions	The course is aimed at understanding by future teachers the relationship of mathematical facts within mathematical disciplines, as well as the relationship of mathematical concepts with concepts from other fields of science	PD
43	Complex Analysis	The course aims to provide pre-service teachers with an understanding of the basic concepts of complex analysis, numerical and functional series, Fourier integral, Fourier and Laplace integral transforms, as well as the relationship between this discipline and other mathematical disciplines. Pre-service teachers are introduced to the current developments in analysis and their use in solving real-world problems.	PD
44	Theory of Series	The course is aimed at understanding the basics of series theory, developing skills to prove mathematical statements of series theory and skills in solving practical problems using methodological principles and mathematical apparatus of this course	PD

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English

45	Mathematics History	mathematics, and the evolution of mathematics as a science. They also develop their skills in identifying the advantages of problem-solving methods used earlier and currently, as well as in systematizing knowledge obtained in various mathematical courses. Pre-service teachers increase their understanding of the general mathematical culture and expand their horizons through familiarization with the historical facts of mathematics, as well as the life and work of outstanding mathematicians.	PD
46	Mathematical Logic and Discrete Mathematics	During the course, pre-service teachers examine the fundamental material on sections of mathematical logic and discrete mathematics, including many mathematical methods and knowledge, which are necessary for a modern teacher of mathematics in the development of algorithms for solving problems of different levels of complexity, and which can be used in their future professional activities and self-development.	PD
47	Quantitative Literacy Basics	During the course, pre-service teachers develop their abilities to reflect on a mathematical solution to a real-world problem, as well as to recognize and identify opportunities to use mathematical apparatus (mathematical concepts, facts, procedures and tools). They also develop their abilities to reason about the rationality of using mathematical apparatus to create a mathematical model reflecting the features of the described situation, and to interpret and evaluate the resulting solution. Pre-service teachers develop their abilities to explain and argue a mathematical solution in the context of a real-world problem.	PD
48	Lesson Study and Action Research	During the course, pre-service teachers develop their research interests as future teachers.	PD
49	Physics	During the course, pre-service teachers conduct a practical study of the laws of nature, the properties and structure of matter, and the laws of its motion. They explore the basic knowledge of the fundamental physical laws through practical experiments, while paying particular attention to the essence of the laws themselves and the phenomena they describe	PD
50	Probability Theory and Mathematical Statistics	During the course, pre-service teachers develop their understanding of the structure of theoretical and probabilistic models of random events, quantities, and processes. They impart skills in solving probabilistic and statistical problems, processing statistical information, and obtaining statistically justified conclusions using standard methods and models. Pre-service teachers develop their skills in building and analyzing mathematical models that reflect the properties, characteristics, and dependencies that exist in real random phenomena and processes.	PD