Ф.7.02-10

Ministry of Sciences and Higher Education of the Republic of Kazakhstan
M. Auezov South Kazakhstan University

«APPROVED»
Acting Chairman of the Board - Rector
_____ K. Nurzhanov
«23» 05 2024

EDUCATIONAL PROGRAM

7M01510-Mathematics

Registration Number	7M01500014
Code and Classification of Education	7M01 Pedagogicalscience
Code and Classification of Areas of Training	7M015 Training of teachers in natural science subjects
Group of educational programs (EP)	M010 Training of mathematics teachers
Type of EP	Acting EP
ISCE level	7
NQF level	7
IQF level	7
Language learning	Kazakh, Russian
The complexity of EP	2 years
Distinctive features of EP	
Partner University (JEP) -	-
University partner (DDEP) -	-

Shymkent, 2024 y.

Developers:

Full Name	Position	Signature
Sh. Altynbekov	Acting Head of the Department of Mathematics, PhD	
L. Iskakova	Director of the Branch Orleu for Turkistan region and Shymkent city, Doctor of Pedagogical Sciences, professor 07.02.24	
A. Amankulova	Director of the school-gymnasium No.1 named after A.S.Pushkin 06.02.24	
A. Sakhova	Director of the specialized gymnasium No.8 with instruction in three languages named after M.H.Dulati 05.02.24	
Zh. Sarsenbayeva	Director of gymnasium No.50 named after A.Baitursynov 05.02.24	
A. Kayypov	Director of secondary school No.65 05.02.24	
P. Duisebaeva	Senior Lecturer of the Department of Mathematics	
A. Bakbergen	Master's student of the EP-23-1nk group	

The Educational Program was reviewed at a meeting of the Academic committee for quality assurance of Educational Programs in Natural Sciences, Mathematics and Statistics
Minutes № 4 «23» 02 2024 y.

Chairman of the Committee _____ A. Tursynbaev

The Educational Program was considered and recommended for approval at Educational-methodical meeting of M. Auezov SKU,
Minutes № 4 «28» 02 2024 y.

Chairman of the EMM _____ K. Sarykulov

The Educational Program was approved by the decision of the Academic Council of the University,
Minutes № 10 «28» 03 2024 y.

Content

1. CONCEPT OF THE EDUCATIONAL PROGRAM

Mission of the University	We are focused on generating new competencies, training a leader who translates research thinking and culture.
University Values	– Openness - open to change, innovation and cooperation. – Creativity - generates ideas, develops them and turns them into values – Academic freedom - free to choose, develop and act. – Partnership - creates trust and support in a relationship where everyone wins. – Social responsibility - ready to fulfill obligations, make decisions and be responsible for their results.
Graduate Model	– Deep subject knowledge, their application and continuous expansion in professional activity – Information and digital literacy and mobility – Research skills, creativity and emotional intelligence – Entrepreneurship, independence and responsibility for their activities and well-being – Global and national citizenship, tolerance to cultures and languages
Uniqueness of the EP	- Orientation to the regional labor market and social order through the formation of professional competencies of the graduate, adjusted to the requirements of stakeholders - Practical orientation and emphasis on the development of critical thinking and entrepreneurship, the formation of a wide range of skills that will allow to be functionally literate and competitive in any life situation and be in demand in the labor market
Academic Integrity and Ethics Policy	The university has taken measures to maintain academic integrity and academic freedom, protection from any type of intolerance and discrimination: - Rules of academic integrity (order No. 212 of October 10, 2022); - Anti-corruption standard (order No. 221 n/a dated 12/07/2021). - Code of Ethics (Order No. 212 of October 10, 2022)
Regulatory and legal framework for the development of EP	1.Law of the Republic of Kazakhstan "On Education"; 2. Model rules for the activities of educational organizations implementing educational programs of higher and (or) postgraduate education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 30, 2018 No. 595 with amendments and additions dated December 29, 2021. No. 614 3. Standard rules for admission to training in educational organizations implementing educational programs of higher and postgraduate education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 31, 2018 No. 600 with amendments and additions dated 06/02/2023. No. 252 4. State mandatory standards for higher and postgraduate education, approved by order of the Ministry of Education and Science of July 20, 2022 No. 2; 5. Rules for organizing the educational process in credit technology of education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated April 20, 2011 No. 152; with changes and additions from 09/23/2022. No. 79 6. Qualification reference book for positions of managers, specialists and other employees, approved by order of the Minister of Labor and Social

	Protection of the Population of the Republic of Kazakhstan dated December 30, 2020 No. 553. 7. Methodological recommendations for introducing ECTS principles into the educational process and expanding academic freedom. Appendix to the order of the Minister of Science and Higher Education. of the Republic of Kazakhstan dated February 12, 2024 No. 57 8. Guidelines for the development of educational programs for higher and postgraduate education, Appendix 1 to the order of the Director of the National Center for the Development of Higher Education of the Ministry of Education and Science of the Republic of Kazakhstan dated May 4, 2023 No. 601 n/k
Organization of the educational process	– Implementation of the principles of the Bologna Process – Student-centered learning – Availability – Inclusivity
Quality assurance of EP	– Internal quality assurance system – Involvement of stakeholders in the development of the EP and its evaluation – Systematic monitoring – Updating the content (updating)
Requirements for applicants	They are established in accordance with the Standard Rules for admission to training in educational organizations implementing educational programs of higher and postgraduate education by order of the Ministry of Education and Science of the Republic of Kazakhstan No. 600 dated October 31, 2018, with changes and additions dated June 2, 2023. No. 252
Conditions for the implementation of educational programs (EP) for persons with disabilities and special educational needs(SSN)	For students with SEN (special educational needs) and persons with disabilities (PSI), tactile PVC tiles, specially equipped toilets, a mnemonic diagram, and shower bars have been installed in educational buildings and student dormitories. Special parking spaces have been created. Crawler lift installed. There are desks for people with limited mobility (PLM), signs indicating the direction of movement, ramps. In the educational buildings (main building, building No. 8) there are 2 rooms with six working places adapted for users with disorders of the musculoskeletal system (DMS).For visually impaired users, the SARA™ CE Machine (2 pcs.) is available for scanning and reading books. The library website is adapted for the visually impaired. There is a special NVDA audio program with a service. The JIC website http://lib.ukgu.kz/ is open 24/7. An individual differentiated approach is provided for all types of classes and in the organization of the educational process.

2. PASSPORT OF THE EDUCATIONAL PROGRAM

Purpose of the EP	Preparation of masters of pedagogical Sciences in mathematics for higher education.
Tasks of the EP	-providing conditions for acquiring a high intellectual level of development, mastering logical and critical thinking, systematic theoretical knowledge and practical skills in fundamental and relevant areas of mathematics; -development of the ability to use acquired knowledge in professional activities, scientifically prove and defend their opinions, independently solve tasks at the modern level in their professional activities; -development of self-study skills and continuous professional development throughout their professional activities, which will allow masters to successfully adapt to changing conditions; -Establishing conditions for the development of in-demand knowledge and skills, as well as a conscious attitude towards enhancing the welfare of society and conserving the planet within the framework of the SDGs
Harmonization of EP	• 7th level of the National Qualifications Framework of the Republic of Kazakhstan; • Dublin descriptors of the 7th level of qualification; • 7 cycle of a Framework for Qualification of the European Higher Education Area); • 7th Level of European Qualification Framework for Life long Learning).
Connection of EP with the professional sphere	Professional standard: Teacher (faculty) of higher and (or) postgraduate education organizations. Order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated November 20, 2023 No. 591.
Name of the degree awarded	After the successful completion of the Educational Program, the graduate is awarded the degree of Master of Pedagogical Sciences of 7M01510-Mathematics.
List of qualifications and positions	-teacher at the university, methodologist of the Department of education -head of the scientific group in research institutes and laboratories and computer centers -specialist, leading specialist in management organizations
Field of professional activity	- mathematics; -educational activities in the field of higher education; -research in mathematics; -research in the field of methods of teaching mathematics
Objects of professional activity	-educational organizations -work at enterprises and associations in order to ensure production and technological processes, production and management processes in firms and companies; -state institutions, organizations of all forms of ownership
Subjects of professional activity	-system of theoretical knowledge in mathematical disciplines; -theoretical and methodological foundations of scientific research in pedagogy; -methodology of research in the field of mathematical education; -a system of methods for implementing research results into practical educational practice; -mechanisms of commercialization of research results; -a system of practical skills for the development of scientific and

	methodological complexes, author's courses; -the system of pedagogy of higher education; -systems of student psychology; -pedagogical management system; -development of educational and methodological materials; -application of norms, rules, forms, methods and means of international cooperation in the professional sphere.
Types of professional activity	- math teacher - university teacher - organizational and managerial; - research and development; - socio-pedagogical; - organizational; - calculation and design; - pedagogical
Learning outcomes	LO1. Effectively use a foreign language in interpersonal communication, in professional activity, in writing scientific articles; the use of modern information and digital technologies for research, for work in the educational field. LO2.Get a professional education, deep specialized knowledge in the field of mathematics, methods of teaching mathematics; demonstrate knowledge about current trends in the development of scientific knowledge, about current methodological problems of mathematics. LO3. Analyze the main methodological problems of teaching mathematics, have the skills to study problems in the field of mathematics teaching methods, generate a hypothesis, set a task, solve a problem, get results, prove the effectiveness of proposals and use them to improve teaching methods of mathematical disciplines and education management. LO4. Apply knowledge in professional activities in higher educational institutions, successfully carry out research and teaching activities using effective teaching methods, critically evaluate the scientific organization of the work of a higher school teacher. LO5. Demonstrate skills in solving mathematical applied problems, professional introduction of classes in higher educational institutions. LO6. Integrate knowledge gained within different disciplines, use them to solve analytical and managerial tasks in new unfamiliar conditions. LO7. Summarize the results of experimental research and analytical work with the involvement of information resources in the form of a master's thesis, an article, a report, an analytical note, etc. LO8. Possess the skills to acquire new knowledge necessary for professional activity and continuing education in PhD doctoral studies.

3. COMPETENCIES OF THE EDUCATIONAL PROGRAM GRADUATE

GENERAL COMPETENCIES (SOFT SKILLS): Behavioral skills and personal qualities	
GC 1. Competence in managing one's literacy	GC1.1. The ability to self-study, self-develop and constantly update their knowledge within the chosen trajectory and in an interdisciplinary environment. GC1.2. The ability to express thoughts, feelings, facts and opinions in the professional sphere. GC1.3. The ability to mobility in the modern world and critical thinking.
GC 2. Language competence	GC2.1. The ability to express and understand concepts, thoughts, feelings, facts and opinions in the field of education and exact sciences, in written and oral forms (listening, speaking, reading and writing). GC2.2.Interact linguistically appropriately and creatively in all variety of social and cultural contexts: during studies, at at work, at home and at leisure.
GC 3. Mathematical competence and competence in the field of science	GC3.1.The ability and willingness to apply the educational potential, experience and personal qualities acquired during the study of mathematical, natural science, technical disciplines at the university, to determine ways to control and evaluate the solution of professional problems, the development of mathematical and natural science thinking.
GC 4. Digital competence, technological literacy	GC4.1.The ability to confidently and critically use modern information and digital technologies for work, leisure and communication, to possess the skills of using, restoring, evaluating, storing, producing, presenting and exchanging information through a computer, communicating and participating in cooperating networks using the Internet in the field of professional activity.
GC 5. Personal, social and educational competencies	GC5.1.The ability to possess the skills of critical thinking, interpretation, creativity of analysis, drawing conclusions, evaluation; to have creativity and an active life position; to make professional decisions in conditions of uncertainty and risk. GC5.2. The ability to possess social and ethical values based on public opinion, traditions, customs, norms and to focus on them in their professional activities; to know the cultures of the peoples of Kazakhstan and observe their traditions; to observe the basics of the legal system and legislation of Kazakhstan, to know the trends of social development of society; to be able to adequately navigate in various social situations; be able to find compromises, correlate their opinion with the opinion of the team; possess business ethics, ethical and legal norms of behavior; strive for professional and personal growth; work in a team, defend your point of view correctly, offer new solutions; demonstrate tolerance towards other individuals. GC5.3.To successfully carry out research activities; to know the patterns of psychological and physiological development of students, including those with special needs and their manifestations in the educational process at different age periods, to use knowledge of pedagogy, psychology and methods of teaching mathematics in professional activities, taking into account criteria assessment, pedagogical innovation and technology, to be capable of innovation, strive to develop their pedagogical skills.
GC 6. Entrepreneurial competence	GC6.1. The ability to know and understand the goals and methods of state regulation of the economy, the role of the public sector in the economy; possess the basics of economic knowledge; possess the skills of critical thinking, interpretation, creativity of analysis, drawing conclusions,

	evaluation; manage projects to achieve professional objectives, manage personnel, demonstrate entrepreneurial skills.
GC 7. Cultural awareness and self-expression	GC7.1. The ability to know and understand the traditions and culture of the peoples of Kazakhstan, is tolerant to the traditions and culture of other peoples of the world, is aware of the attitudes of tolerant behavior; is not subject to prejudice, has high spiritual qualities, is formed as an intelligent person. GC7.2. The ability to be tolerant of the traditions and culture of other peoples of the world, to possess high spiritual qualities, to show ideological, civic and moral positions.
PROFESSIONAL COMPETENCIES (HARD SKILLS):	
Theoretical knowledge and practical skills specific to this field	PC1. Knowledge of general forms, patterns and tools of fundamental and applied mathematics and other mathematical disciplines.
	PC2. The ability to use basic knowledge from mathematics, physics and other natural sciences in cognitive and professional activities.
	PC3. Conduct scientific research in the professional field.
	PC4. Master the techniques of computer modeling and methods of theoretical analysis of the results of observations and experiments.
	PC5. The ability to study and apply innovative pedagogical experience, the desire for self-education and self-realization.

3.1. MATRIX FOR CORRELATING LEARNING OUTCOMES IN THE EDUCATIONAL PROGRAM AS A WHOLE WITH THE COMPETENCIES BEING DEVELOPED

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8
GC1	✓						✓	
GC2		✓	✓	✓	✓	✓		✓
GC3	✓			✓	✓	✓	✓	
GC4		✓	✓				✓	✓
GC5		✓	✓					✓
PC 1		✓		✓				
PC 2	✓					✓		
PC 3			✓	✓			✓	
PC 4				✓	✓			✓

4. MATRIX OF THE INFLUENCE OF MODULES AND DISCIPLINES ON THE FORMATION OF LEARNING OUTCOMES AND INFORMATION ON LABOR INTENSITY

№	Name of the module	Cycle	Component	Name of the discipline	Brief description of the discipline	Number of credits	Generated learning outcomes (codes)							
							LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8
1	Module of Scientific and Pedagogical Training	BD	BK	History and Philosophy of Science	Purpose: To study the problems of the phenomenon of science as a subject of special philosophical analysis, patterns and trends in the development of special activities for the production of scientific knowledge taken in a socio-cultural context. Identification of the specifics and interrelation of the main problems of the history and philosophy of science. The study of the laws of the development of science and the structure of scientific knowledge, methods of scientific research. Knowledge of the basic concepts and directions of the non-classical and post-non-classical stages of the development of science. Analysis of the realities of modern theory and practice based on the understanding of the methodology of natural science, socio-humanitarian and technical knowledge. Critical thinking as a prerequisite for the development and functioning of modern society. Technologies for the development of critical thinking: consideration and study of the logic of arguments. Formation of critical reflexive thinking and metacognitive abilities	4						✓		✓

		BD	BK	Foreign Language (Professional)	The goal is the systematic deepening of communicative competence within the framework of international standards of foreign language education based on the further development of skills and abilities of active language proficiency in the professional activity of the future graduate student. Content. Levels B2, C1 are presented in the form of a pragmatic professional orientation for professional and academic purposes at an advanced level: scientific information base, interpretation of scientific information, argumentation, beliefs, scientific polemics, academic writing. The use of innovative methods and technologies, and the involvement of modern means (Internet resources). Demonstration of knowledge of language material in any related discipline	4	✓							
		BD	BK	Psychology of Management	The purpose of the discipline: demonstration of knowledge about the methodological analysis of the problem of personality psychology. Content: the main approaches and principles of modern psychological science that may be useful in the professional activities of highly qualified specialists are considered. Psychological knowledge and skills are analyzed in the context of their application in the practice of self-knowledge, communication, professional and personal growth. The study of psychological characteristics of personality is carried out. Psychological knowledge is used for the purpose of self-knowledge and cognition of others.	4				✓			✓	

		BD	BK	Higher School Pedagogy	Purpose: formation of the foundations of the professional and pedagogical culture of a university teacher, general pedagogical competencies, familiarization of undergraduates with the theoretical and methodological foundations of higher school pedagogy, technologies of planning, organization and management of the educational process at the university. Content. Modern paradigms of education, history and the latest trends in the development of higher professional education in the world and in Kazakhstan. Genesis and methodology of higher school pedagogy, competence of a university teacher. Problems of university didactics, problems of organization of educational work with students, management of a modern university. Modern approaches and methods of teaching and organization of students' learning activities, assessment of academic achievements.	4					✓		✓	
2	Methodical Fundamentals of Teaching	PD	BK	Teaching Methods of Special Disciplines	The purpose of the discipline is to prepare undergraduates for teaching in the field of mathematics at Universities, to develop skills in planning and conducting training sessions, lectures, seminars adapted to the requirements of specialized disciplines. The formation of competencies necessary for the effective transfer of knowledge, the development of educational skills and abilities to students. Content: planning of the educational process, choice of teaching methods, development of educational materials, effective communication with students, assessment of academic performance, use of modern information technologies in the educational process and adaptation of curricula to the needs of students.	5					✓		✓	

		BD	BK	Pedagogical Practice	Purpose: formation of practical skills and teaching experience among undergraduates. Preparation of undergraduates for professional work in the field of higher education, including practical application of teaching methods and technologies, organization of the educational process, interaction with students and assessment of their academic performance. Content: planning and conducting training sessions, development of curricula and materials, evaluation and analysis of educational achievements, reflection and introspection of teaching activities, ethics and professional responsibility of the teacher, the use of information technology in the educational process and the solution of pedagogical tasks. Protection of the practice report.	4						✓	✓	✓
3	Scentific Foundations of the Educational Process	PD	KB	Scientific Fundamentals of Elementary Mathematics	Purpose: to study the set-theoretic and logical base of mathematics. Content: To apply the axiomatic method in the construction of mathematical structures, their modeling. Application of logical structures of arithmetic and its teaching, algebraic equations and inequalities, algebraic and transcendental numbers, transcendence of numbers e and π. Properties of functions, their classification, limit, continuity, differentiability.Methods of defining and specifying functions	4		✓	✓					

		PD	KB	Methodical System of Teaching Mathematics	Purpose: To study the scientific and psychological-pedagogical foundations of the structure and content of the mathematics course at school and higher education institution, principles, methods and means of teaching mathematics. Content: Analysis of modern methods of teaching mathematics in the magistracy. Development of curricula and lesson plans in mathematics. Approaches to the assessment and control of students' knowledge. Application of information technologies in teaching mathematics. Principles of organization and conduct of practical classes and laboratory work. The role of independent work of students in teaching mathematics. Application of active teaching methods in mathematical education. The use of modern educational resources and technologies in teaching mathematics. Development of teaching and communication skills with students.					✓	✓			

		PD	KB	Elements of Probability Theory and Mathematical Statistics in School	Purpose: to study advanced theorems of probability theory and statistics, problems and relevance of teaching the discipline at school. Contents: The Law of Large Numbers (ZBH), the Central Limit Theorem (CPT), Lindeberg-Levy CPT, Lyapunov CPT, Bayes Theorem, Estimation Theory (Maximum Likelihood Method, Least Squares Method), Confidence Intervals. Topical issues of the integral and differential probability distribution function of a continuous random variable	5		✓		✓				
		PD	KB	Mathematical Processing of Observations	Purpose: to study methods of analysis and interpretation of data obtained as a result of observations or experiments. Content: statement of a static problem. Selection. Variation series. Empirical distribution function. Numerical characteristics of the variation series. Kolmogorov's criterion of consent. Point estimates. Interval estimates. Estimation of the parameters of the normal distribution. Correlation analysis. Methods of statistical processing on a computer. Markov chains. Basic concepts of random processes. Stationary processes. Poisson processes. Markov processes. Kolmogorov differential equations. Simulation of random processes on a computer.							✓	✓	✓

4	Fundamental Issues of Modern Mathematics	BD	KB	Fundamental Issues of Algebra, Geometry and Logics	The purpose of the discipline is to study the basic concepts, structures and methods in algebra, geometry and logic, as well as to study their relationship and influence on each other. Development of a deep understanding of basic algebraic, geometric and logical structures, as well as the ability to apply them in various fields of mathematics and science. Contents: algebraic structures (groups, rings, fields), linear and abstract algebra, group theory, algebraic geometry, algebraic topology, formal logic, model theory, set theory and other fundamental issues in these fields.	5		✓	✓					
		BD	KB	Polynomial Theory	The purpose of the discipline is to study the basic concepts, properties and methods related to polynomials. The main goal is to develop a deep understanding of polynomials, their properties and applications in various fields of mathematics and science. Contents: basic operations with polynomials, factorization and roots of polynomials, Bezu's theorem and the remainder division theorem, polynomials in rings and fields, interpolation by polynomials, approximation by polynomials, Chebyshev polynomials, Lagrange polynomials and other important aspects of the theory of polynomials.			✓	✓					

		PD	KB	Fundamental Issues of Mathematical Analysis	Purpose: to deepen the knowledge of undergraduates in the field of mathematical analysis and study the fundamental concepts, theorems and methods of this discipline. The main goal is to develop abstract and logical thinking, as well as the ability to apply mathematical analysis in other areas of mathematics and science. Contents: limits and continuity of functions, differentiation and integration of functions, Fourier series and series, measure and integral theory, differential equations, functional analysis and other basic concepts and methods of mathematical analysis. Questions of mathematical analysis and its methodology.	5			✓		✓			
		PD	KB	Theory of Bessel Functions	Purpose: To demonstrate knowledge of the theory of Bessel functions. Apply problem solving skills in the theory of Bessel functions. Analyze the effectiveness of solving problems in the theory of Bessel functions. Contents: Bessel differential equations. Definition of the Bessel function. Modulated Bessel functions of the 1st kind and the 2nd kind of the nth order. Analysis of weak convergence of linear functionals in the space C and D				✓					

		PD		Research Practice	Purpose: to develop undergraduates' research skills, independent conduct and analysis of scientific research in mathematics and its teaching. Formation of skills to plan and implement research projects, collect and analyze data, formulate conclusions and present research results. The content is related to current problems in the chosen field of mathematics, research methods, current trends and developments in the scientific community, as well as the acquisition of skills for publishing scientific articles and presenting research results at conferences.	6		✓					✓	✓
5	Theoretical Fundamentals of teaching Mathematics	BD	KB	Mathematical Proofs	The purpose of the discipline is to develop the skills of mathematical argumentation, logical thinking and the ability to conduct formal proofs. Contents: basic concepts of logic and mathematical proof, methods of proof in algebra, analysis and number theory, set theory and mathematical induction, formalization of proofs in computer systems, proofs of existence and uniqueness, proofs from the opposite and contraposition, proofs by mathematical induction. Mathematical proofs in geometry. Mathematical proofs of theorems from special sections of mathematics.	5		✓	✓		✓			

		BD	KB	Innovative Methods of Teaching Mathematics	Purpose: to study approaches to advanced training of teachers of mathematics and advanced technologies of teaching mathematics. Content: Research of scientific works in the field of mathematics. The study of the philosophical foundations of mathematics. Development of the theory of educational texts that create conditions for the intellectual education of students in math lessons at school, a 12-year system of education, training in a new format, training in small schools.					✓	✓			
		PD	KB	Pedagogical Research and Methods of Experiment Conducting	Objective: to develop undergraduates' pedagogical research skills and to master the methods of conducting experiments in the educational field. Formation of competencies necessary for planning and conducting pedagogical research, data collection and analysis, interpretation of results and presentation of conclusions, writing and design of scientific articles. Content: research methods in pedagogy, selection of data collection methods, statistical analysis of results, ethical aspects of research, planning of experimental studies, design and development of experimental curricula, evaluation of the effectiveness of teaching methods, research of the impact of technology on the educational process and other topics related to pedagogical research and experiment.	4						✓	✓	

		PD	KB	Modern Methodology of Teaching Mathematics	Purpose: to study modern approaches and methods of teaching mathematics, to develop their professional skills and competencies in the field of mathematical education. Formation of an understanding of the basic principles, models and innovative approaches that can be used for effective teaching of mathematics. Content: modern approaches to the organization of the educational process in mathematics, the integration of information technology in teaching mathematics, differentiation and individualization of learning, the development of mathematical thinking and problem-based learning, assessment and analysis of academic achievements, the formation of educational competencies and the development of motivation of students in mathematics, as well as the study of modern research in the field of methods of teaching mathematics.						✓	✓	✓	

		BD	KB	Selected Chapters of Geometry for Profile School	Purpose: to study the main topics and concepts of geometry, which are of particular importance for specialized schools. The main goal is to develop undergraduates' deep understanding of geometric principles, properties and methods, as well as the ability to apply them in solving various geometric problems. Contents: analytical geometry, triangle and circle geometry, spatial geometry, projective geometry, spherical geometry, geometric transformations, geometric constructions, as well as the connection of geometry with other areas of mathematics and its application in real problems.	5			✓	✓				

		BD	KB	Problem of Theory and Practice of Teaching Mathematics	Objective: to analyze and study the main problems associated with teaching mathematics, as well as to study modern theoretical and practical approaches to their solution. Formation of critical thinking and research skills in the field of teaching mathematics, as well as the development of the ability to analyze, evaluate and apply existing theories and methods in their practice. Content: research of educational standards and programs in mathematics, analysis of the effectiveness of teaching methods, problems of motivation and involvement of students, individualization of learning, the role of technology in teaching mathematics, solving difficulties and mistakes of students, evaluation and analysis of educational achievements, development and adaptation of teaching materials and teaching methods.					✓	✓			

6	Applied Mathematics and Fundamentals of Integral Equations	PD	KB	Theory of Difference Boundary Value Tasks	Objective: to study the basic concepts, methods and theoretical aspects related to difference boundary value problems. Development of undergraduates' deep understanding of the theory of difference equations and their application in solving boundary value problems, as well as the ability to apply appropriate methods for the analysis and numerical solution of such problems. Contents: classification of difference boundary value problems, methods of analysis and existence of solutions, methods of numerical solution, convergence and stability of numerical methods, analysis of difference schemes, applications of difference boundary value problems.	6		✓	✓					
		PD	KB	Methods for Solving Extremal Tasks	Objective: to study the basic methods and techniques for solving extreme problems that arise in various fields of mathematics and applications. To develop the skills of analysis, modeling and solving extreme problems, as well as the ability to apply appropriate methods to optimize and find extreme values of functions. Contents: Lagrange multiplier method, calculus of variations, optimal control, optimality conditions, convex optimization, dynamic programming methods, numerical optimization methods, application in economics, physics.			✓	✓					

		PD	KB	Methods for Solving Linear Integral Equations	Objective: to study various mathematical methods and techniques used to solve linear integral equations. The development of skills in the analysis, application and solution of integral equations, which are widely used in many fields, including physics, engineering, economics and applied mathematics. Contents: Volterra equations, Fredholm equations, eigenfunction decomposition methods, iteration methods, Galerkin methods, Collocation methods, analytical and numerical methods for solving linear integral equations.	6		✓	✓					
		PD	KB	Asymptotic Complex Analysis Methods	The purpose of the discipline is to study mathematical methods that allow approximating and analyzing functions, especially near singular points and at infinity, using complex analysis. Development of skills in applying asymptotic methods to solve problems in various fields, such as physics, engineering, mathematics and others. Contents: asymptotic expansions, stationary phases, the pass method, the stationary phase method, boundary layers, singular points, Gauss-Lezhandre methods and Bubnov-Galerkin methods in complex analysis.			✓	✓					

		PD	KB	Laplace Transformation and Their Application	The purpose of the discipline: the study of a mathematical tool that allows you to move from functions defined on a positive semi-axis to functions of a complex variable. The main goal is to develop the skills of applying the Laplace transform to solve differential and integral equations, as well as the analysis of dynamical systems. Contents: Definition of the Laplace transform. Original and image. The theorem of the existence of an image. The behavior of the image at infinity. Basic properties of the Laplace transform. Uniformity. Additivity. Similarity. The displacement theorem in the image. Differentiation of the original and the image. Integration of the original and the image. Definition and properties of convolution of functions. The theorem is burning. Duhamel formulas. Property of convolution and images. Finding the original by image.	6		✓	✓			✓	✓	
		PD	KB	Asymptotic Methods for Solving Singular-Perturbation Tasks	The purpose of the discipline is to study mathematical methods that allow approximating solutions of differential equations with singular perturbations. The main goal is to develop the skills of analysis and problem solving, where conventional methods of solving are not applicable due to the presence of special points or singularities. Contents: asymptotic expansions, pass methods, multiscale analysis methods, boundary layers, Fresnel methods, Wentzel methods, Bubnov-Galerkin methods, applications in physics and engineering.			✓	✓			✓	✓	

		PD	KB	Special Functions	Purpose: to get acquainted with the main classes of special functions and their properties, as well as to develop the ability to apply these functions to solve problems and analyze mathematical models, to study various mathematical functions that have special properties and are widely used in science, engineering and other fields. Contents: trigonometric functions, hyperbolic functions, Legendre polynomials, Hermite polynomials, Bessel functions, Laguerre functions, Gamma and beta functions, Lambert special functions, etc.	6		✓	✓					
		PD	KB	Differential Equations with Operator Coefficients	Objective: to study mathematical methods and techniques for solving differential equations in which coefficients are operators. Contents: operator calculus, equations with operator coefficients of the first and second order, boundary value problems, eigenvalues and eigenfunctions of operators, methods of asymptotic analysis for solving equations with operator coefficients, applications in physics and engineering.			✓	✓					

7	Module of scientific-research work and Final Certification	PD		Research work of a master student, including passing an internship and completing a master's thesis	Purpose: to develop the scientific and research skills of a graduate student, immersion in current problems and topics of the chosen field of mathematics and its teaching. The content includes the implementation of a literary review, the formulation of a research question, the conduct of experiments or data analysis, the interpretation of results and the extraction of scientific conclusions. As part of the internship, the undergraduate gets practical experience and works on specific tasks related to the chosen research topic.	24		✓					✓	✓
				Execution and Defense of Master`s Thesis	Purpose: demonstration of scientific competence and confirmation of scientific and research skills acquired by a master's student in the process of studying in a master's degree, as well as presentation of original research results. Development of methodology, formation of the empirical part of the work, Discussion and conclusions, writing of the conclusion (the position of the deduced for defense), preparation of the dissertation, public presentation of the research results before the commission	8							✓	✓

5. SUMMARY TABLE REFLECTING THE VOLUME OF DISBURSED LOANS BY EDUCATIONAL PROGRAM MODULES

Course of training	Semester	Amount of the mastered modules	Amount of the studied disciplines		Amount of KZ credits					Total in hours	Total loans KZ	Amount	
			University component	Optional component	Theoretical training	Pedagogical practice	Research practice	RWM	Execution and Defense of Master`s Thesis			Exam	Diff. credit
1	1	5	4	2	29			1		900	30	7	2
	2	5	1	4	22	4		4		900	30	4	2
2	3	4		2	11		6	3		600	20	2	2
	4	4		3	16			4		600	20	3	1
	5	1						12	8	600	20		1
Total		7	5	11	73	4	6	24	8	3600	120	16	8

6. STRATEGIES, TEACHING METHODS AND ARTIFICIAL INTELLIGENCE, MONITORING AND ASSESSMENT

Learning strategies	**Student–centered learning:** The master's student is the center of teaching/learning and an active participant in the learning and decision-making process. **Practice-oriented training:** orientation to the development of practical skills.
Teaching methods	Conducting lectures, seminars, practical and laboratory work, various types of practices, using: • innovative technologies: • problem-based learning; • case study; • work in a group and creative groups; • discussions and dialogues, intellectual games, olympiads, quizzes; • reflection methods, projects, benchmarking; • Bloom's taxonomies; • presentations; Rational and creative use of information sources: • multimedia training programs; • electronic textbooks; • digital resources. machine learning methods Organization of independent work of master's students, individual consultations. Provision of inclusive education to persons with special needs corresponding to the Roadmap for the development of inclusive Education in Higher and (or) postgraduate education organizations for 2023-2025 (Approved by the Minister of the Ministry of Education and Science of the Republic of Kazakhstan on 03/27/2023)
Monitoring and evaluation of the achievability of learning outcomes	**Current control** on each topic of the discipline, control of knowledge in classroom and extracurricular classes (according to syllabus). Assessment forms: • survey in the classroom; • testing on the topics of the academic discipline; • control works; • protection of independent work; • term papers; • colloquiums; • essays, etc. **Boundary control** at least twice during one academic period within the framework of one academic discipline. **Intermediate certification** is carried out in accordance with the working curriculum, academic calendar. Forms of holding: • exam in the form of testing; • oral examination; • written exam; • combined exam; • project protection; • protection of practice reports. **Final state certification**.

7. EDUCATIONAL AND RESOURCE SUPPORT OF THE EDUCATIONAL PROGRAM

Information Resource Center	The structure of the EIC has 6 subscriptions, 16 reading rooms, 2 electronic resource centers (ERC). The basis of the network infrastructure of the EIC is 180 computers with Internet access, 110 automated workstations, 6 interactive whiteboards, 2 video dvoik, 1 video conferencing system, 3 scanners of A-4 format, 3. The software of the EIC – АИБС «ИРБИС-64» for MSWindows (a basic set of 6 modules), an autonomous server for uninterrupted operation in the ИРБИС system. The library fund is reflected in the electronic catalog available to users on the website http://lib.ukgu.kz is on-line 24 hours 7 days a week. Thematic databases of their own generation have been created: "Almamater", "Труды ученых ЮКГУ", "Электронный архив". Online access from any device 24/7 via an external link http://articles.ukgu.kz/ru/pps. Working with catalogs in electronic form. The EC consists of 9 databases: "Books", "Articles", "Periodicals", "Труды ППС ЮКГУ", "Rare books", "Electronic Fund", "ЮКГУ в печати", "Readers" of "SKU". The EIC provides its users with 3 options for accessing its own electronic information resources: from the Electronic Catalog terminals in the catalog hall and divisions of the EIC; through the university's information network for faculties and departments; remotely on the library's website http://lib.ukgu.kz/ Access to international and republican resources is open: "SpringerLink", "Полпред", "Web of Science", "EBSCO", "Эпиграф", to electronic versions of scientific journals in open access, "Зан", "РМЭБ", "Әдебиет", Digital library "Aknurpress", "Smart-kitap", "Kitap.kz", etc. For people with *special needs and disabilities*, the library's website has been adapted to the work of visually impaired users in the ERC.
Material and technical base	Audiences 320, 321, 325, 302, 309, 310., printer, scanner. There are 33 computers in two computer classes (Core 2 Quad, Intel Core 2 Duo), 3-in-1 Multifunctional Device (copier, printer, scanner). In the computer room (302, 309) computers have access to the Internet.

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