



EDUCATIONAL PROGRAM

6B01 - Pedagogical sciences

(Code and classification of the field of education)

6B015 - Teacher training in natural science subjects

(Code and classification of the direction of training)

0114

(Code in the International Standard Classification of Education)

B009 - Math teacher training

(Code and classification of the educational program group)

6B01502 - Mathematics-Informatics

(Code and name of the educational program)

Bachelor

(Level of preparation)

Semey

Educational program

6B01 – Pedagogical sciences

(Code and classification of the field of education)

6B015 - Training of teachers in Natural science subjects

(Code and classification of the direction of training)

0114

(Code in the International Standard Classification of Education)

B009 - Math teacher training

(Code and classification of the educational program group)

6B01502 - Mathematics-Informatics

(Code and name of the educational program)

bachelor

(Level of preparation)

PREFACE

Developed

The educational program 6B01502 - Mathematics-Informatics in the direction of preparation 6B015 - Training of in Natural science subjects on the basis of the State Compulsory Standards of Higher and Postgraduate approved by the Order of the Ministry of Science and Higher Education of the Republic of Kazakhstan dated July 20, No 2 (as amended by the order) was developed by the Academic Committee dated 20.02.2023 No 66).

Members of the Academic Committee	Full name	Academic degree, academic title, position
Head of the Academic Committee	Ospanova Dinara	Dean of the Higher School of Physical and Mathematical Sciences
Educational program manager	Sagitova Shuga	Senior lecturer
Member of the AC	Zholymbaev Oraltai	Associate Professor of the Department of Mathematics
Member of the AC	Rakhmatullina Zarina	Senior lecturer
Member of the AC	Zhamalbayeva Zhuldyz	Teacher of Mathematics at KSU «Secondary school No. 19»
Member of the AC	Bayakhmetova Shynar	Teacher of computer science of KSU «Multidisciplinary gymnasium No. 5 named after shakarim»
Member of the AC	Slyambekova Akmaral	Student of the MI-101 group
Member of the AC	Kudaibergenova Akniyet	Student of the MI-301 group

Reviewing

Full name of the reviewer	Position, place of work
Burkenov Narken	Director of the Nazarbayev Intellectual School of Physics and Mathematics in Semey
Kuanyshbaeva Aizhan	KSU "Secondary school No. 40" of the Department of Education of the city of Semey

Reviewed

At a meeting of the Academic Quality Commission of the Natural and Mathematical of the faculty
Protocol No.3 "9" of January 2024

At a meeting of the Academic Quality Commission of the Higher School of Physical and Mathematical Sciences
Recommended for approval by the Academic Council of the University
Protocol No.1 «06» June 2024

Agreed

Head of the education department of the city of Semey Bulabaev B.Z.

Approved

at a meeting of the University Academic Council by protocol No. 6/1 of January 19, 2024.

at a meeting of the University Academic Council by protocol No. 11 of June 28, 2024.

Content

1. Introduction
2. PASSPORT OF THE EDUCATIONAL PROGRAM:
 - 2.1. EP purpose;
 - 2.2. Map of the training profile within the educational program:
 - Code and classification of the field of education;
 - Code and classification of the direction of training;
 - Code in the International Standard Classification of Education;
 - Code and classification of the educational program group;
 - Code and name of the educational program;
 - 2.3. Distinctive features of the OP (double degree/joint, OVPO-partner, Double major, innovative);
 - 2.4. Qualification characteristics of the graduate:
 - Degree awarded / qualification;
 - Name of professional standard;
 - Atlas of new professions;
 - Regional standard;
 - Name of the profession / list of positions of a specialist;
 - OQF qualification level (industry qualification framework);
 - Area of professional activity;
 - Object of professional activity;
 - Types of professional activity;
 - 2.5. Graduate Model.
3. Modules and content of the educational program
4. Summary table on the scope of the educational program 6B01502 - Mathematics-Informatics»

1.Introduction

1.1.General data

The Department of Physical and Mathematical Sciences and Informatics of the Faculty of Natural Sciences and Mathematics of the NAO "Shakarim University of Semey" provides training on the educational program 6B01502 - "Mathematics-Informatics". The educational program for the training of teachers of mathematics and computer science has been operating since 2019.

Graduates of the educational program 6B01502 - "Mathematics- Informatics" apply the acquired skills in any work that is related to the use of software, information computing techniques, communication networks and systems and the conduct of mathematical calculations. The student will be able to apply the acquired skills in analytical, scientific, design, research and technological fields. Also, EPs are in demand in small-grade schools in sparsely populated regions of the republic.

When implementing the educational program, it is planned to use artificial intelligence tools in the educational process, thereby developing digital competencies among students in a rapidly changing technological environment.

The educational program provides for the education of a student with special educational needs in the conditions of a higher educational institution, as well as his socialization and integration into society.

1.2.Completion criteria

The main criterion for the completion of the educational process in the preparation of bachelors is the acquisition of at least 205 credits of theoretical training, as well as at least 27 credits of practice, not 8 credits for the preparation of diplomas. Total 240 credits.

1.3.Typical study duration: 4 year

2.PASSPORT OF THE EDUCATIONAL PROGRAM

2.1.EP purpose	Training of a competitive specialist with professional competencies in the field of theory and methods of teaching mathematics and computer science, who knows how to apply modern information technologies at a high level, possesses theoretical knowledge, practical skills and skills.
2.2.Map of the training profile within the educational program	
Code and classification of the field of education	6B01 - Pedagogical sciences
Code and classification of the direction of training	6B015 - Training of teachers in Natural science subjects
Code in the International Standard Classification of Education	0114
Code and classification of the educational program group	B009 - Math teacher training
Code and name of the educational program	6B01502 - Mathematics-Informatics
2.3.Distinctive features of the OP (double degree/joint, OVPO-partner, Double major, innovative)	-
2.4.Qualification characteristics of the graduate	
Degree awarded / qualification	bachelor of Education in the educational program 6B01502-Mathematics-Informatics
Name of professional standard	Teacher
Atlas of new professions	-
Regional standard	-
Name of the profession / list of positions of a specialist	Teacher. High school teacher
OQF qualification level (industry qualification framework)	6
Area of professional activity	<ul style="list-style-type: none"> - Teacher of mathematics and informatics; - research institutions; - middle schools, and secondary professional education institutions; ☒ state management bodies; organizations of various forms of ownership that use the methods of mathematics and computer science in their work; - state-owned enterprises and institutions. ☒ business, economy. officials in educational organizations (Director of a general education institution, Deputy directors for educational work, etc.) - methodologist in educational organizations; - specialist in the field of pedagogical sciences; in research institutions.
Object of professional activity	<ul style="list-style-type: none"> - research institutions; - middle schools, and secondary professional education institutions; - state educational management bodies; - organizations of various forms of ownership that

	use methods of teaching mathematics and computer science in their work.
Types of professional activity	<ul style="list-style-type: none"> - use modern pedagogical technologies in teaching mathematics and informatics; - plan and implement research work in the field of pedagogical sciences; - conducting scientific and pedagogical activities in general education organizations; - use of software and computer technology; - organizational and management; - social and pedagogical; - training and educational; - educational and technological.
2.5. Graduate Model	<p>Able to apply socio-cultural, economic and legal, environmental knowledge, communication skills, ready to apply modern information technologies;</p> <p>Ready to apply modern teaching methods and technologies to ensure the quality of the educational process;</p> <p>Able to apply fundamental knowledge of modern mathematics in solving practical problems in various fields;</p> <p>Ready to carry out intrasubject and intersubject connections in the educational process, to explain mathematical knowledge in various forms;</p> <p>Ready to apply the basic methods of special sections of computer science in professional activity;</p> <p>Capable of developing software packages and database components using modern programming tools and technology;</p> <p>Able to conduct experiments and analyze using statistical and applied mathematical methods in the field of mathematics and computer science;</p> <p>Ready to demonstrate the desire for professional self-improvement by showing leadership qualities.</p>

3. Modules and content of the educational program

Module 1. Fundamentals of social and humanitarian knowledge

Brief description of the module content

The module includes key disciplines aimed at developing a comprehensive understanding of society and culture. Within its framework, students study sociology, philosophy, history, the world of Abai, the Kazakh (Russian, English) language and cultural studies, which helps them to understand the relationship between social processes and cultural phenomena. The module promotes the formation of critical thinking and analytical skills necessary for the analysis of modern social problems. He also develops the ability to conduct a constructive dialogue and defend his point of view in a reasoned manner. As a result, students acquire the knowledge and competencies necessary for active and informed participation in public life.

Module disciplines

Foreign language

Kazakh(Russian) language (1)

The module of socio-political knowledge (sociology, political science, cultural studies, psychology)

Physical Culture

Foreign language

Kazakh(Russian) language (2)

Bases of economics, law and ecological knowledge

Physical Culture

History of Kazakhstan

Physical Culture

Information and communication technology

Physical Culture

World of Abai

Philosophy

Module 2. Psychological-pedagogical and methodological training of personnel

Brief description of the module content

This module is designed to study such disciplines as pedagogy, inclusive education, age psychology and physiology, methods of teaching mathematics, which are aimed at applying modern teaching technologies and criteria-based assessment, taking into account the individual, physiological and psychological characteristics of students in the work of a future specialist. As a result, students gain solid knowledge and skills that serve as the basis for further professional and academic growth. In order to develop skills for the wide application of fundamental knowledge of modern mathematics in solving practical problems in various spheres of life, it is planned to study subjects: introduction to the specialty of a teacher of mathematics, elementary mathematics, mathematical analysis, analytical geometry, algebra and number theory, theoretical foundations of computer science. As a result, skills are formed to interpret new knowledge, build hypotheses about the further course of solving the problem, and prove it.

Module disciplines

Age psychology and physiology

Pedagogy

Inclusive education

Technologies of the updated content of education and criteria assessment

Pedagogical practice

Pedagogical practice (psychological and pedagogical)

Theory and methodology of teaching mathematics

Information and communication technologies in the specialized school

Methods of using ICT in the educational process

Teaching Techniques of Informatics

Pedagogical practice

Module 3. Foundational level of preparation

Brief description of the module content

In order to develop skills for the wide application of fundamental knowledge of modern mathematics in solving practical problems in various spheres of life, it is planned to study subjects: introduction to the specialty of a teacher of mathematics, elementary mathematics, mathematical analysis, analytical geometry, algebra and number theory, theoretical foundations of computer science. As a result, skills are formed to interpret new knowledge, build hypotheses about the further course of solving the problem, and prove it.

Module disciplines

Introduction to the profession of a teacher of mathematics and computer science

Mathematical analysis 1

Training practice

Elementary mathematic

Algebra and number theory

Analitic geometry

Vector and Euclidean space

Linear algebra

Mathematical analysis 2

Theoretical basics of informatics

Module 4. Theoretical and methodological level of preparation

Brief description of the module content

During the course of the module, students develop a deep understanding of mathematical concepts, problem solving skills and logical thinking. They master the methods of solving geometric problems, and develop the skills to prove theorems.

Module disciplines

Multiple integrals

Mathematical analysis 3

Theory of functions of several variables

Multimedia Processing Technology

Forms and methods of STEM learning

Electronic educational resources

Mathematical logic

Mathematical logic and discrete mathematics

Applied graph theory

Practician of mathematical problems solution

And practical for solving trigonomeyric problems

Solving parametric equations and inequalities

Geometric construction tasks

Methods of geometric problems solution

Problem-based approach in teaching geometry

Professional (pedagogical)

Module 5. Fundamentals of Computer science and Robotics

Brief description of the module content

The module «Fundamentals of Computer Science and Robotics» includes studying the basics of programming in modern programming languages such as C++ and Python, mastering the principles of object-oriented programming, working with electronic educational resources, studying the basics of databases, and developing mobile applications. The course also covers educational robotics, where students learn to construct and program robots to solve tasks in a school environment. This module provides comprehensive training, offering the necessary knowledge and skills for successful work in the modern digital environment.

Module disciplines

Python Programming

Fundamentals of frontend development

Java Programming

Fundamentals of Web Development
Basics of Internet Technologies
C# Programming
C++ Programming
Databases and Information Systems
Corporate information systems
Modern database management system
Active teaching methods in math lessons
Educational robotics at school
Object-oriented programming in C++/C#
Object-oriented programming in Java
Object Oriented Programming in Python
Programming mobile applications in Java
Programming of mobile devices
Mobile app development
Digital tools and services for educational content creation

Module 6. Research

Brief description of the module content

During the study of the module, students develop the skills to conduct experiments in the field of classical sections of mathematics, describe methods of mathematical thinking, use mathematical terms with a comprehensive solution of typical problems, build a structure for solving mathematical problems, compose an algorithm for academic work, competently formulate arguments, master the methodology for solving Olympiad problems, identify hidden assumptions, strive for professional self-improvement, demonstration skills, working with a team, making decisions, demonstrating leadership qualities.

Module disciplines

Differential and integral calculations in tasks of the physics and mathematics equations
Differential equation
Non-standard tasks of school geometry
Theory of possibility and mathematical statistics
Academic writing and the basics of scientific research
The laws of probability and methods of statistical data processing
Management in education
Applied programs in mathematics
Solving non-standard problems
Olympiad and competitive problems solution
Data protection
Information security in computer networks
Cryptographic methods of information protection
Pregraduation practice

Final examination

Brief description of the module content

Writing and defending a thesis or preparing and passing a comprehensive exam.

Module disciplines

Final examination
Graduate work

4. Summary table on the scope of the educational program

«6B01502 - Mathematics-Informatics»

Name of discipline	Cycle/ Component	Term	Number of credits	Total hours	Lec	SPL	LC	IWST	IWS	Knowledge control form
Module 1. Fundamentals of social and humanitarian knowledge										
Foreign language	GER/CC	1	5	150		45		35	70	Examination
Kazakh(Russian) language (1)	GER/CC	1	5	150		45		35	70	Examination
The module of socio-political knowledge (sociology, political science, cultural studies, psychology)	GER/CC	1	8	240	30	45		55	110	Examination
Physical Culture	GER/CC	1	2	60		60				Differentiated attestation
Foreign language	GER/CC	2	5	150		45		35	70	Examination
Kazakh(Russian) language (2)	GER/CC	2	5	150		45		35	70	Examination
Bases of economics, law and ecological knowledge	GER/US	2	5	150	15	30		35	70	Examination
Physical Culture	GER/CC	2	2	60		60				Differentiated attestation
History of Kazakhstan	GER/CC	3	5	150	30	15		35	70	Qualification examination
Physical Culture	GER/CC	3	2	60		60				Differentiated attestation
Information and communication technology	GER/CC	4	5	150	15	15	15	35	70	Examination
Physical Culture	GER/CC	4	2	60		60				Differentiated attestation
World of Abai	BS/US	4	3	90	15	15		20	40	Examination
Philosophy	GER/CC	6	5	150	15	30		35	70	Examination
Module 2. Psychological-pedagogical and methodological training of personnel										
Age psychology and physiology	BS/US	1	5	150	15	30		35	70	Examination
Pedagogy	BS/US	2	5	150	15	30		35	70	Examination
Inclusive education	BS/US	3	3	90	15	15		20	40	Examination
Technologies of the updated content of education and criteria assessment	BS/US	3	5	150	15	30		35	70	Examination
Pedagogical practice	BS/US	4	3	90						Total mark on practice
Pedagogical practice (psychological and pedagogical)	BS/US	4	2	60						Total mark on practice
Theory and methodology of teaching mathematics	BS/US	4	5	150	30	15		35	70	Examination
Information and communication technologies in the specialized school	BS/CCh	5	5	150	15	30		35	70	Examination
Methods of using ICT in the educational process	BS/CCh	5	5	150	15	30		35	70	Examination
Teaching Techniques of Informatics	BS/CCh	5	5	150	15	30		35	70	Examination
Pedagogical practice	BS/US	6	5	150						Total mark on practice

Module 3. Foundational level of preparation

Introduction to the profession of a teacher of mathematics and computer science	BS/US	1	3	90	15	15		20	40	Examination
Mathematical analysis 1	BS/US	2	5	150	30	15		35	70	Examination
Training practice	BS/US	2	2	60						Total mark on practice
Elementary mathematic	BS/US	2	3	90	0	30		20	40	Examination
Algebra and number theory	BS/CCh	3	5	150	15	30		35	70	Examination
Analitic geometry	BS/US	3	5	150	15	30		35	70	Examination
Vector and Euclidean space	BS/CCh	3	5	150	15	30		35	70	Examination
Linear algebra	BS/CCh	3	5	150	15	30		35	70	Examination
Mathematical analysis 2	BS/US	3	5	150	30	15		35	70	Examination
Theoretical basics of informatics	BS/US	4	5	150	15	30		35	70	Examination

Module 4. Theoretical and methodological level of preparation

Multiple integrals	BS/CCh	4	5	150	30	15		35	70	Examination
Mathematical analysis 3	BS/CCh	4	5	150	30	15		35	70	Examination
Theory of functions of several variables	BS/CCh	4	5	150	30	15		35	70	Examination
Multimedia Processing Technology	BS/CCh	5	5	150	15	30		35	70	Examination
Forms and methods of STEM learning	BS/CCh	5	5	150	15	30		35	70	Examination
Electronic educational resources	BS/CCh	5	5	150	15	30		35	70	Examination
Mathematical logic	AS/CCh	5	5	150	15	30		35	70	Examination
Mathematical logic and discrete mathematics	AS/CCh	5	5	150	15	30		35	70	Examination
Applied graph theory	AS/CCh	5	5	150	15	30		35	70	Examination
Practician of mathematical problems solution	AS/CCh	6	5	150		45		35	70	Examination
And practical for solving trigonomeyric problems	AS/CCh	6	5	150		45		35	70	Examination
Solving parametric equations and inequalities	AS/CCh	6	5	150		45		35	70	Examination
Geometric construction tasks	AS/CCh	7	6	180	30	30		40	80	Examination
Methods of geometric problems solution	AS/CCh	7	6	180	30	30		40	80	Examination
Problem-based approach in teaching geometry	AS/CCh	7	6	180	30	30		40	80	Examination
Professional (pedagogical)	AS/CCh	8	15	450						Total mark on practice

Module 5. Fundamentals of Computer science and Robotics

Python Programming	BS/US	5	5	150	15		30	35	70	Examination
Fundamentals of frontend development	BS/CCh	6	5	150	15		30	35	70	Examination
Java Programming	BS/CCh	6	5	150	15		30	35	70	Examination
Fundamentals of Web Development	BS/CCh	6	5	150	15		30	35	70	Examination

Basics of Internet Technologies	BS/CCh	6	5	150	15		30	35	70	Examination
C# Programming	BS/CCh	6	5	150	15		30	35	70	Examination
C++ Programming	BS/CCh	6	5	150	15		30	35	70	Examination
Databases and Information Systems	AS/CCh	6	5	150	15		30	35	70	Examination
Corporate information systems	AS/CCh	6	5	150	15		30	35	70	Examination
Modern database management system	AS/CCh	6	5	150	15		30	35	70	Examination
Active teaching methods in math lessons	AS/CCh	7	5	150	15		30	35	70	Examination
Educational robotics at school	AS/CCh	7	5	150	15		30	35	70	Examination
Object-oriented programming in C++/C#	AS/CCh	7	6	180	15	45		40	80	Examination
Object-oriented programming in Java	AS/CCh	7	6	180	15	45		40	80	Examination
Object Oriented Programming in Python	AS/CCh	7	6	180	15	45		40	80	Examination
Programming mobile applications in Java	AS/CCh	7	5	150	15		30	35	70	Examination
Programming of mobile devices	AS/CCh	7	5	150	15		30	35	70	Examination
Mobile app development	AS/CCh	7	5	150	15		30	35	70	Examination
Digital tools and services for educational content creation	AS/CCh	7	5	150	15		30	35	70	Examination
Module 6. Research										
Differential and integral calculations in tasks of the physics and mathematics equations	BS/CCh	5	5	150	15	30		35	70	Examination
Differential equation	BS/CCh	5	5	150	15	30		35	70	Examination
Non-standard tasks of school geometry	BS/CCh	5	5	150	15	30		35	70	Examination
Theory of possibility and mathematical statistics	AS/US	5	5	150	15	30		35	70	Examination
Academic writing and the basics of scientific research	BS/CCh	7	5	150	15	30		35	70	Examination
The laws of probability and methods of statistical data processing	BS/CCh	7	5	150		45		35	70	Examination
Management in education	BS/CCh	7	5	150	15	30		35	70	Examination
Applied programs in mathematics	BS/CCh	7	5	150	15	30		35	70	Examination
Solving non-standard problems	BS/CCh	7	5	150		45		35	70	Examination
Olympiad and competitive problems solution	BS/CCh	7	5	150		45		35	70	Examination
Data protection	AS/CCh	7	5	150	15	15	15	35	70	Examination
Information security in computer networks	AS/CCh	7	5	150	15	15	15	35	70	Examination
Cryptographic methods of information protection	AS/CCh	7	5	150	15	15	15	35	70	Examination
Pregraduation practice	AS/CCh	8	15	450						Total mark on practice
Final examination										
Final examination		8	8	240						
Graduate work		8	8	240						

Non -Profit Limited Company «Shakarim University of Semey»

Educational program development plan

6B01502 «Mathematics-Informatics»

for 2024-2028

Semey, 2024

Content

№	Name of sections	Pages
1.	Passport of the educational program development plan	3
2.	Analytical justification of the EP	4
2.1	Information about the educational program	4
2.2	Information about students	4
2.3	Internal and external conditions of EP development	4
2.4	Information about teaching staff implementing the educational program	5
2.5	Characteristics of the achievement of the EP	5
3	The main objectives of the EP development plan	5
4	EP risk analysis	6
5	Action plan for the development of the EP	6

1. Passport of the educational program development plan **6B01502 – Mathematics-Informatics**

1	The basis for the development	Development program of the Non -Profit Limited Company «Shakarim University of Semey» for 2023-2029
2	Terms of implementation	2024-2028
3	Expected results of implementation	<p>ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.</p> <p>ON2 Apply modern teaching technologies and criteria-based assessment, taking into account the individual, physiological and psychological characteristics of students.</p> <p>ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity.</p> <p>ON4 Analyze and solve problems of the theoretical and methodological course of higher mathematics, demonstrate basic knowledge in the field of pedagogy when conducting classes in a modern school using various techniques and techniques.</p> <p>ON5 To carry out intrasubject and intersubject connections in the educational process, to explain mathematical knowledge in various forms.</p> <p>ON6 Master and apply the basic methods of special sections of computer science, theory and methodology of the school course program of informatics.</p> <p>ON7 Build logical arguments, hypotheses and rigorous proofs, develop software packages and database components using modern programming tools and technology.</p> <p>ON8 Conduct and design experiments in the field of classical branches of mathematics and computer science.</p> <p>ON9 Formulate and analyze emerging problems using statistical and applied mathematical methods.</p> <p>ON10 Draw conclusions from the materials studied and demonstrate the desire for professional self-improvement by showing leadership qualities.</p>

2. Analytical justification of the EP

2.1 Information about the educational program

The educational program has been developed in accordance with the National Qualifications Framework and Professional Standards, according to the Dublin Descriptors and the European Qualifications Framework. The typical period of mastering the bachelor's degree program is 4 years.

A total of 78 disciplines are studied in the EP. Compulsory subjects studied – 27 (including GED – 13, components of the university: GED – 1, Basic disciplines (BD) – 13, profile disciplines (PD) - 1), optional components: BD - 27, PD – 24. Professional practice – 5.
EP 6B01502-«Mathematics-Informatics» developed by the Academic Committee

The main purpose of the OP is to train a competitive specialist with professional competencies in the field of theory and methodology of teaching mathematics and computer science, who is able to apply modern information technologies at a high level, who has theoretical knowledge, practical skills and abilities.

The main criterion for the completion of the educational process is the development of at least 240 credits, with the award of a bachelor's degree.

2.2 Information about students

Academic year	2024-2025	2025-2026	2026-2027	2027-2028
The basis of trainig				
Grant	30	31	32	32
Contract	10	12	13	13
Total	40	43	45	45

Applicants who have scored more than 75 UNT points can apply for the OP.

2.3 Internal and external conditions of EP development

Graduates of the EP are in demand not only at the regional, but also at the regional and republican level.

In order to improve the quality, the scale of practice bases has been expanded: an agreement has been concluded with schools №2, 3, 7, 16, 23, 25, 27, 30, 32, 37, 39, 40, 47, 49, NIS (physics and mathematics direction), Shakarim high school of the city of Semey.

Students of OP 6B01502-«Mathematics-Informatics» have free use of internal and external academic mobility programs. Internal academic mobility program: Sarsen Amanzholov East Kazakhstan University, Ilyas Zhansugurov Zhetysu University. External academic mobility programs: Jan Amos Komensky University (Leszno, Poland), University of Economics (Bydgoszcz, Poland).

The fund of the scientific library of the university is provided with textbooks, teaching aids, electronic textbooks on the educational program.

2.4 Information about teaching staff implementing the educational program

№	Indicators	Units	2024-2025	2025-2026	2026-2027	2027-2028
1	The share of teaching staff with a degree in EP	%	51	51	52	52
2	Including the share of teaching staff with a degree in the general disciplines cycle	%	56	58	60	60

2.5 Characteristics of the achievement of the EP

Inclusion of students in the EP in the ranks of holders of the Presidential Scholarship

The direction of students under the program of external academic mobility to study at universities of the near and far abroad, as well as under the program of internal academic mobility to study at universities preparing OP 6B01502-«Mathematics-Informatics».

Making additions to the EP for the new academic year together with employees. Participation of students and teaching staff in Start-Up projects, scientific research. Participation in regional, Republican, and international Olympiads in the defense industry.

Equipping classrooms with modern equipment.

Increase the number of scientific papers Web of the Science and Scopus.

Participation in the National ranking of EP universities of the Republic of Kazakhstan.

Increase in the number of branches of the department in order to improve the quality of education, work closely with schools and expand the base of professional practice.

Development and implementation of a plan for the preparation of textbooks, teaching aids, methodological guidelines and electronic textbooks for the educational program.

3. The main objectives of the EP development plan

The development plan of the OP is to train a highly professional competitive specialist in accordance with modern requirements, prepared for the work of teachers of mathematics and computer science in secondary schools, gymnasiums, lyceums, colleges, as well as able to creatively and professionally solve problems at a high scientific and practical level, possessing general cultural and professional competencies in the field of modern pedagogy.

The main criterion for the completion of the educational process for the preparation of bachelors is the development of at least 205 credits of theoretical training, as well as at least 27 credits of practical training (other types of training), at least 8 credits for the preparation, writing and defense of a thesis (project) or preparation and passing of a comprehensive exam. A total of 240 credits.

4. EP risk analysis

№	Name of risks	Measures to eliminate
1	Reduction of the contingent of students in the EP	Attracting students on a contractual basis
2	Insufficient level of language knowledge for the introduction of trilingual education	Organization of language courses for students.
3	Decrease in the level of employment	Conducting events with employers
4	Insufficient development of external and internal academic mobility of students and teaching staff	Conducting explanatory work on academic mobility among students and their parents
5	The risk of reducing the settling down of the teaching staff in the EP	Referral of young specialists for targeted PhD training. Participation in competitions announced by the Ministry of Science and Higher Education. Work on the publication of scientific papers on the basis of «Web of the science and Scopus». Activation of advanced training of teaching staff of the department in foreign universities and research institutes

5. Action plan for the development of the EP

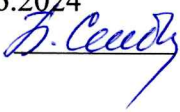
№	Criteria	Expected results	Units	2024-2025	2025-2026	2026-2027	2027-2028
Direction 1. Educational and methodological support							
1.1	Updating the educational program based on professional standards, taking into account the recommendations of employers	Conducting an examination of the Educational program 6B01502-«Mathematics-Informatics» in order to improve the practice orientation and development of professional competencies of graduates	fact	+	+	+	+

1.2	Monitoring and updating catalogs of elective disciplines in accordance with the development of key and professional competencies, the demands of the labor market	Improving the quality of the content of educational programs by including elective courses aimed at developing the key and professional competencies of graduates in accordance with the demands of the labor market.	fact	+	+	+	+
1.3	Introduction of modern learning technologies into the educational process, contributing to the development of cognitive activity, communicative ability of students	Improving the quality of teaching academic disciplines, taking into account the novelty and variety of forms of work that contribute to the development of cognitive activity.	fact	+	+	+	+
1.3.1	Introduction of mass open online courses (MOOCs) in the educational process according to the educational program 6B01502-«Mathematics-Informatics»	Introduction of disciplines into the educational process Improving the quality of teaching academic disciplines, taking into account the novelty and diversity of forms of work that contribute to the development of cognitive activity.	unit.	1	-	1	-
1.4	Involvement of social partners and employers in the development, examination of the implementation of educational programs	Improving the quality of educational programs implemented taking into account market demands and recommendations of employers	unit.	2	2	2	2
1.5	Development and implementation of elective courses in English	Introduction of disciplines in English into the educational process	unit.	-	-	-	-
1.6	Conducting seminars and round tables on the application of innovative technologies in the educational process	Introduction of innovative technologies in the educational process	unit.	2	2	2	2
1.7	Publication of educational, methodical and scientific literature on the implemented OP	Improvement of educational and methodological support in the disciplines of the implemented educational programs	unit.	1	1	2	2
1.8	Conclusion of contracts with foreign and domestic partner universities in order to develop academic exchange of students of all levels and teaching staff	Creation of a database of foreign and domestic partner universities for the development of academic exchange of students of all levels and teaching staff	unit.	-	1	-	1
1.9	Inviting students from partner universities to study for a semester, short-term internships, internships, etc.	Development of international recognition of educational programs, implementation of academic mobility programs for students	p.	-	1	-	1

1.10	Participation of teaching staff and students in international academic exchange programs	Development of international cooperation with foreign universities implementing educational programs in the direction <u>B009 Training of teachers of mathematics</u>	p.	-	1	-	1
1.11	Development of outgoing academic mobility of teaching staff and students in the direction 6B01502-Mathematics-Informatics	Improvement of the educational program based on the use of the experience of implementing such programs in leading foreign universities	p.	-	1	-	1
Direction 2. Teaching staff							
2.1	Professional development and training of scientific and pedagogical personnel for the implementation of educational programs once every 5 years	The share of teaching staff who have passed advanced training at the national and international level is at least 20%	p.	2	2	2	2
2.2	Advanced training, retraining, internships of teaching staff at the international level	Completion of at least 2 teachers of the advanced training program, retraining, internships of teaching staff at the international level	p.	-	1	-	1
2.3	Promotion of publications of the works of teaching staff in international publications indexed by the Web of Science and Scopus databases	Increase in the share of teaching staff who have published the results of scientific research in publications indexed by the Web of Science and Scopus databases – at least 30% of the total number of teaching staff	%	30	30	30	30
2.4	Involvement of practical specialists in teaching and scientific activities	Participation in the implementation of educational programs of practitioners (at least 20% of specialists)	%	20	20	20	20
Direction 3. Internationalization of educational programs							
3.1	Conclusion of agreements on international cooperation with foreign universities	Implementation of joint projects, preparation of scientific publications with foreign partners, creation of bases for scientific internships of students	unit.	-	1	-	1
3.2	Attracting foreign students to study under the educational program 6B01502-"Mathematics-Informatics"	Increasing the number of foreign students	p.	-	-	-	-

3.3	Organization of joint scientific and practical events with international partners	Improving the efficiency of scientific and methodological activities of teaching staff, exchange of experience with foreign partners	unit.	-	1	-	1
Direction 4. Logistics and digitalization							
4.1	Step-by-step equipment of classrooms with technical training tools (projectors, panels, interactive and multimedia whiteboards, multifunctional devices, webcam, projector screen, etc.)	Equipping the classrooms assigned to the department with technical training tools (projectors, panels, interactive and multimedia boards, multifunctional devices, webcam, projector screen, etc.)	unit.	-	1	-	1
4.2	Automation of the educational process (testing, session management, student contingent movement, dean's office, department, teaching staff load, schedule, library, syllabuses)	Information management based on the automation of the educational process (testing, session management, student contingent movement, dean's office, department, teaching staff load, schedule, library, syllabuses)	fact	+	+	+	+
4.3	Replenishment of the full-text database of research results of teaching staff and students, teaching staff (articles, monographs, etc.)	Increase in the number of results of scientific works of scientists, research of teaching staff and students, teaching staff (articles, monographs, etc.)	fact	10	15	20	25
4.4	Expansion of the fund of scientific and educational literature, including on electronic media for implemented educational programs	Ensuring the implementation of educational programs based on modern educational and information resources, including on electronic media	%	50	50	50	50
4.5	Monitoring the content and improvement of the faculty's website	Formation of the faculty's website on various aspects of the implementation of educational programs.	%	50	60	65	70

Head of the department  Dinara Ospanova

Reviewed
at the meeting of the Commission on Academic Quality
of the Higher School of Physical and Mathematical Sciences
Protocol No 6 of 06.06.2024
Chairman of the CAQ  Zheldybayeva Balgyn

Agreed
Dean of the Higher School  Dinara Ospanova
06.06.2024