NJSC SHAKARIM UNIVERSITY OF SEMEY

# DEVELOPMENT PLAN EDUCATIONAL PROGRAM

## 6B01502 - Mathematics-Informatics

Semey

**NPJSC «Shakarim University of Semey»**

Approved by
Member of the Board –
Vice-Rector for academic affairs
_____ Indira Oralkhanova
«__» _____ 2023 y.

# 6B01502 «Mathematics-Informatics»
# Educational program development plan
# for 2023-2027 years

**Semey, 2023**

## Content

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

| | | |
|---|---|---|
| 1 | The basis for the development | Strategic Plan of Shakarim University for 2021-2025 Faculty work plan |
| 2 | Developed by the Academic Committee of the EP | Head of AK: Mukayev Zhandos Toleubekovich<br>EP Manager: Sagitova Shuga Galiakbarovna<br>Members of the AK:<br>Ospanova Dinara Manapovna<br>Rakhmatullina Zarina Talgatovna<br>Mynbaeva Maigul Makeevna<br>Bazhenova Gulzhanat Tleulinovna<br>Abdrakhmanova Zhupar Kabidollovna<br>Slyambekova Akmaral Bakytbekovna<br>Employee:<br>Toktubayeva Gulfariza Temirbaevna |
| 3 | Terms of implementation | 2023-2027 |
| 4 | Ожидаемые результаты реализации | ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.<br>ON2 Apply modern teaching technologies and criteria-based assessment, taking into account the individual, physiological and psychological characteristics of students.<br>ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity.<br>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.<br>ON5 To carry out intrasubject and intersubject connections in the educational process, to explain mathematical knowledge in various forms.<br>ON6 Master and apply the basic methods of special sections of computer science, theory and methodology of the school course program of informatics.<br>ON7 Build logical arguments, hypotheses and rigorous proofs, develop software packages and database components using modern programming tools and technology.<br>ON8 Conduct and design experiments in the field of classical branches of mathematics and computer science.<br>ON9 Formulate and analyze emerging problems using statistical and applied mathematical methods.<br>ON10 Draw conclusions from the materials studied and demonstrate the desire for professional self-improvement by showing leadership qualities. |

## 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

Reviewed at the meeting of the Commission for Quality Assurance of the Faculty of Natural Sciences and Mathematics (Protocol No. 4/1 of 4.04.2023)

Approved at the meeting of the Academic Council of the University (Protocol No. 8 of 25.04.2023).

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 aboutstudents

| Academic year / The basis of trainig | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 |
|---|---|---|---|---|
| Grant | 30 | 32 | 33 | 35 |
| Contract | 10 | 13 | 14 | 16 |
| Total | 40 | 45 | 47 | 51 |

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 №3, 7, 16, 23, 25, 27, 30, 32, 39, 47, 49, NIS (physics and mathematics direction) 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 | 2023-2024 | 2024-2025 | 2025-2026 | 2023-2027 |
|---|---|---|---|---|---|---|
| 1 | The share of teaching staff with a degree in EP | % | 51 | 54 | 55 | 56 |
| 2 | Including the share of teaching staff with a degree in the general disciplines cycle | % | 57 | 58 | 59 | 61 |

**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 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 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 201 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 riskanalysis

| № | Name ofrisks | Measurestoeliminate |
|---|---|---|
| 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.<br>Participation in competitions announced by the Ministry of Science and Higher Education.<br>Work on the publication of scientific papers on the basis of «Web of the science and Scopus».<br>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 | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 |
|---|---|---|---|---|---|---|---|
| **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 graduateses | 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 | 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. | 2 | 3 | 3 | 3 |
| 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 B009 Training of teachers of mathematics | 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 | 2 | 3 | 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. | 5 | 5 | 5 | 5 |
| 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 | 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 | % | 4 | 5 | 5 | 6 |
| 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. | - | 1 | 1 | - |
| 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 | 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. | 2 | 2 | 2 | 2 |
| 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 | 15 | 15 | 15 | 15 |
| 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. | % | 65 | 70 | 73 | 74 |

**Head of the department** _____ **Dinara Ospanova**

**Reviewed**
at a meeting of the Commission on Quality Assurance
of the faculty of Natural Sciences and Mathematics
Protocol No 6 of 06.06.2023
Chairman of the CQA _____ Zheldybayeva Balgyn

**Agreed**
Dean of the faculty _____ ZhandosMukayev
06.06.2023