NJSC SHAKARIM UNIVERSITY OF SEMEY

EDUCATIONAL PROGRAM

7M01 - Pedagogical sciences
(Code and classification of the field of education)

7M015 - Training of teachers in Natural science subjects
(Code and classification of the direction of training)

0114
(Code in the International Standard Classification of Education)

M012 - Training of computer science teachers (kazakh, russian, english languages)
(Code and classification of the educational program group)

7M01503 - Informatics
(Code and name of the educational program)

Master
(Level of preparation)

Semey

Educational program

7M01 -- Pedagogical sciences
(Code and classification of the field of education)

7M015 - Training of teachers in Natural science subjects
(Code and classification of the direction of training)

0114
(Code in the International Standard Classification of Education)

M012 - Training of computer science teachers (kazakh, russian, english languages)
(Code and classification of the educational program group)

7M01503 - Informatics
(Code and name of the educational program)

Master
(Level of preparation)

Semey 2024

PREFACE

Developed

The educational program 7M01503 - Informatics in the direction of preparation 7M015 - Training of teachers in Natural science subjects on the basis of the State Compulsory Standards of Higher and Postgraduate Education approved by the Order of the Ministry of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 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	Ryszhanova Aizhan	senior lecturer of the Department of physical and Mathematical Sciences and informatics
Member of the AC	Kydyralina Lazat	I.o. associate professor of the Department of Physical and Mathematical Sciences and Informatics, PhD
Member of the AC	Sembayev Talgat	PhD, senior lecturer of the Department of physical and Mathematical Sciences and informatics
Member of the AC	Mynbayeva Maigul	Teacher of computer science «Nazarbayev Intellectual school of Physics and Mathematics in Semey»
Member of the AC	Aliyeva Toleugaisha	Head of the «Department for monitoring the content of education and the quality of education» of the «Regional Innovation and Methodological Center» of the «Department of Education of the Abai district», methodologist on the subject of informatics
Member of the AC	Nurtayeva Kuralay	Master student of the MIP-301 group in the EP 7M01503-Informatics

Reviewing

Full name of the reviewer	Position, place of work
Tayapbergenova Anar	Nazarbayev Intellectual School Semey
Abylkassimov Kairbek	Municipal state institution "Secondary school No. 15" of the Department of Education of the city of Semey

Reviewed

Considered
At a meeting of the Academic Quality Commission of the
Natural and Mathematical of the faculty
Protocol № 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

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

1.1.General data

The educational program "7M01503-Informatics" implemented by the Department of Physical and Mathematical Sciences and Informatics of the NAO "Shakarim Semey University", developed taking into account the needs of the regional labor market, the requirements of regulatory documents of the Ministry of Education and Science of the Republic of Kazakhstan and is a system of documents for the organization of the educational process of teacher training in the direction of OP "7M01503-Informatics".

The program is aimed at training masters who are ready for educational activities in secondary specialized and higher educational institutions as a computer science teacher, who possess a methodological base and a complex of systematized knowledge in the field of computer science, who possess modern technologies of pedagogical activity, who use modern information and communication technologies to create and apply electronic educational resources in scientific, methodological and managerial activities, capable of planning and implementing educational and scientific activities in the field of theory and methods of teaching computer science.

The educational program is focused primarily on teachers who have the first higher education as computer science teachers, mathematics teachers, physics teachers and currently teach computer science in schools, colleges, etc.

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 for the preparation of masters of the scientific and pedagogical direction is the development of at least 88 credits of theoretical training, including 6 credits of pedagogical practice, 13 credits of research practice, as well as at least 24 credits of research work of a master`s student, including internships and the completion of a master s thesis, at least 8 credits of the final attestations . A total of 120 credits.

1.3.Typical study duration: 2

2.PASSPORT OF THE EDUCATIONAL PROGRAM

2.1.EP purpose	training of competent personnel who possess modern pedagogical technologies and teaching methods, capable of conducting scientific research, application and implementation of promising research results in the field of informatization of education.
2.2.Map of the training profile within the educational program	
Code and classification of the field of education	7M01 - Pedagogical sciences
Code and classification of the direction of training	7M015 - Training of teachers in Natural science subjects
Code in the International Standard Classification of Education	0114
Code and classification of the educational program group	M012 - Training of computer science teachers (kazakh, russian, english languages)
Code and name of the educational program	7M01503 - Informatics
2.3.Distinctive features of the OP (double degree/joint, OVPO-partner, Double major, innovative)	The educational program covers socially significant issues at the scientific and practical level
2.4.Qualification characteristics of the graduate	
Degree awarded / qualification	Master of Pedagogical Sciences under the educational programme 7M01503 – Informatics
Name of professional standard	Pedagog
Atlas of new professions	Tutor Zerocoder Personal Code Security Consultant Digital Linguist
Regional standard	
Name of the profession / list of positions of a specialist	Teacher. University teacher Teacher moderator Social pedagogue Teacher-psychologist Curator Teacher-assistant Head of the organization Head of the structural division Deputy Head of the structural division
OQF qualification level (industry qualification framework)	7 (sublevels 7.1; 7.2)
Area of professional activity	it includes research, design, organizational and managerial and pedagogical work related to the use of information and communication tools and technologies
Object of professional activity	educational institutions of state and non-state funding, pre-school educational organizations, schools, lyceums, gymnasiums, colleges, educational institutions of technical and vocational education; scientific organizations: scientific, research institutions and centers in the field of applied informatics, informatization of education, pedagogy, psychology and teaching methods; management organizations: state management bodies, education departments;

Types of professional activity	1. Education and development of children and young students in general education organizations, educational institutions and centers: computer science teacher and club, etc. University teacher; ИКТ Manager of ICT projects in the field of education; head of informatization processes in educational institutions. 2. Science: Junior researcher; лаб Laboratory assistant. 3. Organizations, institutions and enterprises related to the use of information and communication tools and technologies: Administrative employee.
2.5.Graduate Model	Competent personnel who have mastered modern pedagogical technologies and teaching methods, are able to conduct scientifc research, apply and implement prospective results of scientifc research in the feld of educational information

3.Modules and content of the educational program

Sociolinguistic and scientific-pedagogical activity

Brief description of the module content

Promotes the formation of sociolinguistic competence and the application of fundamental scientific, pedagogical, managerial, communication knowledge and skills in professional activities.

Module disciplines

Foreign language (professional)

History and philosophy of science

Higher Education Pedagogy

Psychology of management

Pedagogical practice

Professional and methodical preparation

Brief description of the module content

Develops knowledge about the theoretical foundations and technologies of teaching ICT and computer science, obtained at The Bachelor`s degree. Teaches the implementation of methodological support of the educational process. Have the ability to summarize and critically evaluate the results of domestic and foreign researchers, identify promising areas, and develop a research program. The student is taught to solve the tasks of professional activity at a modern level, to demonstrate the ability to present information and to scientifically prove and defend their scientific point of view.

Module disciplines

Methods of teaching informatics in high school

Using of ICT at assessment of results of training

Methods of using ICT in the educational process

Methodological training of Informatics teacher at the University

Informatization methods of control and assessment of training results

Modern methods of control and evaluation

Informatization of education and learning problems

Research activities of students in computer science

The research work of a student, including an internship and the implementation of a master s thesis I

Planning and organization of scientific and pedagogical research

Applied methods of analysis and processing of information in research

Automation of scientific research

Administrative information and education networks

Knowledge Engineering

Innovative interactive teaching methods

Information technology

Competence-based learning in higher education

Mobile learning and virtual reality

The research work of a student, including an internship and the implementation of a master s thesis II

Assessment of competency-based learning outcomes

Legal issues of Informatization

System of electronic evaluation of the level of competence

Creation of multimedia educational tools

Social and humanitarian aspects of Informatization

Social Media for Flexible Online Learning

Practice research

Modern methods of programming in education

Brief description of the module content

Has deep scientific knowledge in the field of software. Deepens their understanding of the meaning and importance of information in the development of modern society. Master the basic methods, methods and means of obtaining, storing, processing information.

Module disciplines

Artificial neural networks

Workshop on the development of digital educational resources using artificial intelligence

Teaching the basics of artificial intelligence in basic and additional general education

Methods of creating electronic textbooks

Cloud computing

Means media, scientific visualization and virtual realities

The research work of a student, including an internship and the implementation of a master s thesis III

Brief description of the module content

Writing and defending a master`s thesis.

Module disciplines

Master`s dissertation

4.Summary table on the scope of the educational program

«7M01503 - Informatics»

Name of discipline	Cycle/ Component	Term	Number of credits	Total hours	Lec	SPL	LC	IWST	IWS	Knowledge control form
Sociolinguistic and scientific-pedagogical activity										
Foreign language (professional)	BS/US	1	3	90		30		20	40	Examination
History and philosophy of science	BS/US	1	5	150	15	30		35	70	Examination
Higher Education Pedagogy	BS/US	1	3	90	15	15		20	40	Examination
Psychology of management	BS/US	1	3	90	15	15		20	40	Examination
Pedagogical practice	BS/US	3	6	180						Total mark on practice
Professional and methodical preparation										
Methods of teaching informatics in high school	BS/CCh	1	5	150	15	30		35	70	Examination
Using of ICT at assessment of results of training	BS/CCh	1	5	150	15	30		35	70	Examination
Methods of using ICT in the educational process	BS/CCh	1	5	150	15	30		35	70	Examination
Methodological training of Informatics teacher at the University	BS/CCh	1	5	150	15	30		35	70	Examination
Informatization methods of control and assessment of training results	BS/CCh	1	5	150	15	30		35	70	Examination
Modern methods of control and evaluation	BS/CCh	1	5	150	15	30		35	70	Examination
Informatization of education and learning problems	AS/US	2	5	150	15	30		35	70	Examination
Research activities of students in computer science	AS/US	2	5	150		15	30	35	70	Examination
The research work of a student, including an internship and the implementation of a master s thesis I	AS/US	2	11	330						Total mark on practice
Planning and organization of scientific and pedagogical research	AS/CCh	2	5	150	15	30		35	70	Examination
Applied methods of analysis and processing of information in research	AS/CCh	2	5	150	15	30		35	70	Examination
Automation of scientific research	AS/CCh	2	5	150	15	30		35	70	Examination
Administrative information and education networks	AS/CCh	3	5	150	15	30		35	70	Examination
Knowledge Engineering	AS/CCh	3	5	150	15	30		35	70	Examination
Innovative interactive teaching methods	AS/CCh	3	5	150	15	30		35	70	Examination
Information technology	AS/CCh	3	5	150	15	30		35	70	Examination
Competence-based learning in higher education	AS/CCh	3	5	150	15	30		35	70	Examination
Mobile learning and virtual reality	AS/CCh	3	5	150	15	30		35	70	Examination
The research work of a student, including an internship and the implementation of a master s thesis II	AS/US	3	4	120						Total mark on practice
Assessment of competency-based learning outcomes	AS/CCh	3	5	150	15	30		35	70	Examination

Legal issues of Informatization	AS/CCh	3	5	150	15	30		35	70	Examination
System of electronic evaluation of the level of competence	AS/CCh	3	5	150	15	30		35	70	Examination
Creation of multimedia educational tools	AS/CCh	3	5	150	15	30		35	70	Examination
Social and humanitarian aspects of Informatization	AS/CCh	3	5	150	15	30		35	70	Examination
Social Media for Flexible Online Learning	AS/CCh	3	5	150	15	30		35	70	Examination
Practice research	AS/US	4	13	390						Total mark on practice
Modern methods of programming in education										
Artificial neural networks	BS/CCh	1	5	150		15	30	35	70	Examination
Workshop on the development of digital educational resources using artificial intelligence	BS/CCh	1	5	150		15	30	35	70	Examination
Teaching the basics of artificial intelligence in basic and additional general education	BS/CCh	1	5	150		15	30	35	70	Examination
Methods of creating electronic textbooks	AS/CCh	2	5	150	15	30		35	70	Examination
Cloud computing	AS/CCh	2	5	150	15	30		35	70	Examination
Means media, scientific visualization and virtual realities	AS/CCh	2	5	150	15	30		35	70	Examination
The research work of a student, including an internship and the implementation of a master s thesis III	AS/US	4	9	270						Total mark on practice
Master`s dissertation		4	8	240						

Non -Profit Limited Company «Shakarim University of Semey»

EDUCATIONAL PROGRAM DEVELOPMENT PLAN

7M01503 «INFORMATICS»

for 2024-2026 years

Semey, 2024

Content

1. Passport of the educational program development plan 7M01503 INFORMATICS

1	The basis for the development	- The development program of the NAO "Shakarim University of Semey" for 2023-2029 - The work plan of the faculty
2	Terms of implementation	2024-2026
3	Expected results of implementation	Training of highly qualified computer scientists who ensure the implementation of pedagogical and research, expert-analytical and organizational-managerial activities and the formation of an intellectual elite for the educational, cultural and scientific spheres

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 master's degree program is 2 years.

OP "7M01503-Informatics" was developed by the Academic Committee

The main criterion for the completion of the educational process for the preparation of masters of the scientific and pedagogical direction is the development of at least 88 credits of theoretical training, including 6 credits of pedagogical practice, 13 credits of research practice, as well as at least 24 credits of research work of a master's student, including internships and the completion of a master's thesis, at least 8 credits of the final attestations . A total of 120 credits.

The purpose of the educational program is to train competent personnel who possess modern pedagogical technologies and teaching methods, capable of conducting scientific research, applying and implementing promising research results in the field of informatization of education

2.2 Information about students

Academic year / The basis of trainig	2024-2025	2025-2026
Grant	1	2
Contract	-	2
Total	1	4

2.3 Internal and external conditions of EP development

The educational program is aimed at studying the most modern achievements in computer science, mastering modern research methods in the field of development and application of electronic educational resources, professional selection and analysis of information processing in scientific research and applied methods. Prospects for the development of professional competencies access to Internet resources, including the electronic library of the university and the resources of the scientific library of the university (the library fund is equipped with printed and electronic publications, educational and scientific literature on the disciplines of the specialty) National Electronic Library of Kazakhstan, ChemSpider electronic database, Republican Interuniversity Electronic Library, eLibrary.RU databases of the Russian electronic scientific library of information.

Teachers implementing the educational program have the potential for development, that is, the desire for improvement and self-development through the integration of educational, scientific and innovative activities in their work. The teaching staff of the department systematically improves their qualifications through courses, classes of the scientific and methodological seminar of the department. The result of this is the application of various methods and forms in the learning process. Widely used in the content of lectures and seminars are teaching methods such as:

- game methods (role-playing, educational, business, reflective, imitation, etc.);

- brainstorming;
- collective cognitive activity;
- group work;
- video method;
- multimedia technology;
- round table;
- debates;
- problem-based search method.

Not only traditional forms of education are used in the classroom, but also modern ones:

- integrated lecture;
- problem lecture;
- lecture conversation;
- training seminar.

To implement the OP, pedagogical and research practice is organized and conducted in educational institutions, organizations with which contracts have been concluded. The objects of students' research practice are secondary schools, lyceums: KSU "Secondary School No. 39 named after Alikhan Bokeikhan" of the Semey City Education Department of the Abay region Education Department, KSU "Secondary School No. 16 named after Toleubai Amanov " of the Semey City Education Department of the Abay region Education Department,

The scientific internship of undergraduates is carried out in cooperation with the NAO "VKU named after S.Amanzholov" and the NAO "Pavlodar Pedagogical University" named after Alkey Margulan.

2.4 Information about teaching staff implementing the educational program

№	Indicators	Units	2024-2025	2025-2026
1	The share of teaching staff with a degree in EP	%	**80**	**85**
2	Including the share of teaching staff with a degree in the general disciplines cycle	%	**100**	**100**

2.5 Characteristics of the achievement of the EP

The implementation of OP 7M01503-Informatics is provided by scientific and pedagogical personnel who have a higher basic education corresponding to the profile of the disciplines taught, and are successfully engaged in scientific and methodological activities.

The list of educational computer programs that are actively used in the educational process is expanding. To form the competence of teaching staff at the university, a number of IS have been developed and are being improved: operating systems and office applications installed on computers used in the educational process and for research.

The educational process management system and the implementation of distance learning technologies are used by the AIS program, the university constantly conducts training seminars on the above CLAIMS.

To implement the OP, professional practice is organized and conducted in institutions and organizations with which contracts have been concluded. The objects of professional practice of students are secondary schools, lyceums.

3. The main objectives of the EP development plan

For the effective implementation of the OP , the following tasks are defined:

- improving the training of undergraduates who know the methods and techniques of the main areas of activity in the professional field.

- updating the content of the OP, which forms the main professional competencies of future specialists;
- creation of prerequisites for independent research activity of the student.
- improvement of conditions for obtaining high-quality professional education

The expected final results suggest:

- development of educational and methodical literature;
- the activity of the teaching staff in terms of publications in rating publications with a non-zero impact factor;
- increasing the level of information and technical base;
- advanced training of teaching staff in the field of innovative learning technologies;
- demonstrate a formed worldview as the basis of readiness for professional activity;
- apply a variety of teaching methods;
- implementation of psychological and pedagogical support, support, establishment of contacts and interaction with other subjects of the educational process;
- ways of orientation in professional sources of information (magazines, websites, educational portals, etc.);

4. EP risk analysis

№	Name of risks	Measures to eliminate
1	Insufficient level of language knowledge for the introduction of trilingual education	Expansion of relations with foreign partners in order to implement joint research and publication of educational and methodological literature
2	Insufficient development of external and internal academic mobility of students and teaching staff	Implementation of academic mobility of students and teachers
3	The risk of reducing the settlement of PPS in the OP	Advanced training, the establishment of teaching staff through PhD studies, internships and the involvement of foreign teachers with academic degrees

5. Action plan for the development of the EP

№	Criteria	Expected results	Units	2024-2025	2025-2026
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 "7M01503-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 7M01503-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.	-	-

1.4	Involvement of social partners and employers in the development, examination of the implementation of educational programs	Improving the quality of implemented educational programs taking into account market demands and recommendations of employers	unit.		1
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.	1	
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
1.8	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
1.9	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
1.10	Participation of teaching staff and students in international academic exchange programs	Development of international cooperation with foreign universities implementing educational programs in the direction 7M01503-Informatics	p.	-	-
1.11	Development of outgoing academic mobility of teaching staff and students in the direction 7M01503-Informatics	Improving the educational program based on the experience of implementing such programs in leading universities of the Republic of Kazakhstan	p.		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 level is at least 20%	p.	1	
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.		-
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
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.		-
3.2	Attracting foreign students to study under the educational program "7M01503-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

3.4	Invitation of foreign specialists to give lectures and consultations on master's projects and dissertations	Improvement of the content component of educational programs based on the introduction of the experience of foreign specialists in the implementation of educational programs	unit.		1
3.5	Expansion of cooperation with Leading foreign scientific and educational organizations in order to attract the most qualified foreign specialists to the implementation of educational programs	Formation of key and professional competencies in accordance with the practice of leading universities	p.		1
Direction 4. Logistics and digitalization					
4.1	Step-by-step equipping of classrooms with technical training tools (projectors, panels, interactive and multimedia whiteboards, multifunction devices, webcam, projector screen, etc.)	Equipping classrooms assigned to the department with technical training tools (projectors, panels, interactive and multimedia whiteboards, multifunctional devices, webcam, projector screen, etc.)	unit.		1
4.2	Automation of the educational process (testing, session management, student contingent movement, dean's office, department, teaching staff workload, 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 workload, 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.)	unit.	5	5

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	%	20	30
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.	%	100	100

Head of the department _____ **Kenbayev D**

Reviewed

at the meeting of the Commission on Academic

Quality of the Faculty of Natural Sciences and Mathematics

Protocol No 6 of 06.06.2024

Chairman of the CQA _____ Zheldybayeva Balgyn

Agreed

Dean of the school _____ Ospanova Dinara

06.06.2024